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Longitudinal studies of migrants

Migration and Structural Integration in Switzerland. A Longitudinal Perspective

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Abstract

Researchers and official statisticians are increasingly using methods based on longitudinal approaches to better understand migratory flows and the dynamics of integration in host countries.

In this context, this paper describes in the first part the legal and technical developments in Switzerland that allowed the creation of longitudinal databases with the aim of measuring migration and the structural integration of migrants. Then it outlines the linked-register based database recently developed in the context of a national scientific project called 'NCCR On the Move'. Finally, it presents some results of two indicators that were constructed and calculated using this database.

I. Introduction

1. Longitudinal approaches aim at providing information not only on the stock and the flows of migrants, but also on the duration of the stay and the trends regarding both professional and legal status. They also aim at measuring the pace of integration of different migrant groups defined according to citizenship, the motive of migration or other characteristics. Finally, in a context of equal opportunities for migrants and native citizens, longitudinal approaches intend to measure to which extent the gap between both groups, for instance in terms of wages or unemployment,

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tends to diminish. These longitudinal studies are frequent in countries with population registers, such as in the Nordic countries, or in countries with panels, such as in Canada. In other countries they are rather new as longitudinal data are not common. However, the shift from a traditional toward a modern statistical system, as in the case of Switzerland, provides incentive to develop new measures of migration in a longitudinal perspective.

II. Background

2. International migration plays an increasingly key role in the population growth of many industrialized countries and has sparked numerous debates on the economic and social integration of migrants. Switzerland is no exception, as 25% of its population is made up of foreign nationals and more than one-third (35.9%) has a migration background. At the end of the last decade, migratory flows in Switzerland attained a level which had never been observed since the 1960s. Net migration of Swiss and foreign nationals stood at 98,000 in 2008 (13 per 1,000 persons), representing 90% of the annual population growth¹.

3. Migration was dominated until the early 1970s by the arrival of large numbers of workers from neighbouring countries (mainly Italy) who had few skills and migrated to Switzerland without their families on a temporary basis to work in economic sectors recruiting low-skilled workers (mainly construction, agriculture or hotel and food and beverage services). In the mid-1970s, however, the objectives of the Swiss Government with respect to migration moved towards a new policy of attempting to limit migratory flows but allowing migrants' families to settle in Switzerland. At the same time, Switzerland was concerned by increasing flows of refugees from Vietnam, Turkey and, during the 1990s, the former Yugoslavia.

4. Since then, migrants have stayed longer, the reasons for migration have multiplied, and the countries of origin as well as the occupational characteristics of workers have diversified. This diversification of migration has created a need to better understand the living conditions and the integration process of populations with more varied socioeconomic and cultural profiles.

III. Measuring Integration in Official Statistics

5. In 2007, the Federal Statistical Office (FSO) was officially mandated by the Federal Council to develop, produce and publish a set of (mostly quantitative) indicators in order to evaluate the integration of the population with a migration background in Switzerland. The indicators allow a systematic observation, at regular intervals over a long period of time, of migrants' integration in Switzerland while taking into account the multidimensionality of this process. The operational definition of integration is based on Swiss law which decrees equal opportunities for nationals and non-nationals in Swiss society. The integration monitoring relies on

¹ <https://www.bfs.admin.ch/bfs/fr/home/statistiques/population/effectif-evolution.assetdetail.3222026.html>

surveys and population registers, using a cross-sectional approach (Kristensen and al., 2017).

6. The integration indicators cover 11 areas of life at an individual, social and institutional level. The choice of these areas was based on national and foreign scientific literature; the recommendations of the European Union² and the following Swiss government documents: the Ordinance on the Integration of Foreigners (OIE) and the Federal Council's Report on the evolution of the Confederation's integration policy dated 5 March 2010.

7. The areas in which migration is measured are:

(1) social security and poverty	(7) labour market
(2) culture, religion and media	(8) politics
(3) education and training	(9) health
(4) family and demography	(10) racism, discrimination and security
(5) language	
(6) housing	

8. The integration indicators are the result of a multi-step selection process which involved various government institutions as well as experts from academia. Only those indicators whose development was considered possible and relevant by the FSO were retained. The weighting of the potential indicators according to their estimated importance enabled a set of 68 indicators to be conceived, 33 of which were designated as being key indicators³.

9. Fifteen statistical data sources are necessary to construct and calculate these indicators. The used data stem exclusively from FSO sources and comprise 7 sample surveys (e.g. Labour Force Survey, Survey on Income and Living Conditions) and 8 administrative registers or comprehensive surveys.

10. With initial results published for the first time in 2012, the aim of the FSO's integration monitoring is to offer an independent statistical database for the definition of policies by the competent authorities, democratic debate, research and actions in the field of integration in Switzerland.

11. Despite the introduction of this system of indicators, existing cross-sectional data have difficulty capturing and explaining the complexity of recent migration flows and subsequent integration processes. Central questions such as what proportion of migrants stay or eventually leave Switzerland, or what proportion of migrants become naturalized, cannot be answered with traditional statistics. Furthermore, information on the integration of migrants in the labour market could only be provided for a given point in time, but the process itself can hardly be studied using existing surveys such as the Swiss Labour Force Survey.

12. In this context, a national scientific project with the primary objective of studying the new forms of mobility and migration, 'NCCR On the Move' (National Centre of Competence in Research for migration and mobility studies⁴), is currently

² See "Indicators of Immigrant Integration. A Pilot Study"(2011), Eurostat Methodologies and Working Papers, p. 10 (Zaragoza indicators)

³See the complete set of indicators on <https://www.bfs.admin.ch/bfs/fr/home/statistiques/population/migration-integration/indicateurs-integration/tous-indicateurs.html> (in French only)

⁴ <http://nccr-onthemove.ch/about-us/>

developing a complementary range of indicators based on a longitudinal approach. This project aims at following individual migrants' cohorts since their arrival in Switzerland in order to document changes in their status in the labour market. Funded by the Swiss National Science Foundation, the project was launched in 2014. Part of this project involved developing statistical tools and, specifically, a longitudinal database to document contemporary migration and the living conditions of migrants using a longitudinal approach. This paper describes the steps involved in constructing this database and publishing a new range of indicators. It also comments on the impact of these new statistics on knowledge of contemporary migration.

IV. Legal and technical developments

13. The construction of this database was carried out under the provisions of the Federal Statistics Act which were introduced in 2006 and which allow data matching for research purposes. Article 14a of the Act stipulates that the FSO can link different registers provided that the data remain anonymous. If sensitive data are matched or if the data matching makes it possible to establish individual profiles, the matched data must be erased once the statistical work has been completed. The matched data may also be provided to researchers. In that case, a data protection agreement is to be signed between the FSO and the researchers in order to insure the proper use of the data.

14. The FSO enforces the Statistics Act in three ways. First, data matching has to be carried out at the premises of the FSO, and a work station has been made available for researchers. Secondly, researchers do not have access to non-anonymous data or to the unique personal identifier (see below) that makes certain matchings possible. A pseudo-identifier is generated by the FSO from the real unique identifier and is made available to researchers. Finally, each researcher can only access the variables that are specifically required for his/her research (Steiner and Wanner, 2015).

15. In order to describe migration and integration patterns, the University of Geneva constructed – under the supervision of the FSO – a database compiled from different registers that were matched. This database encompasses various (national or local) population registers, the social security register, the unemployment register as well as the annual FSO structural survey which provides socioeconomic information on a sample of more than 200,000 inhabitants aged 15 and over.

16. The availability of a unique Personal Identification Number (PIN) – corresponding to the social security number – enabled the data linkage. The database that was created eventually included all individuals who were present in Switzerland at the end of at least one calendar year over the course of either 16 years (1998 to 2014) in the case of foreign nationals, or 4 years (2010 to 2014) in the case of Swiss citizens⁵. The database covers stock and flow data, and it provides the demographic profile as well as information regarding the migratory status and socioeconomic and income characteristics of all individuals.

⁵ An update of the database which resulted in including the year 2015 was completed in the first semester of 2017. However, it is not taken into account in this paper.

17. The various registers were linked or compared using two distinct approaches: (1) exact matching by using the common identifier (PIN), (2) matching by applying a specific algorithm.

18. The availability of the unique PIN in the different registers facilitates the linkage of several registers. This 13-digit PIN (known as the NAVS13⁶) is completely anonymous and was introduced at the end of the first decade of the 21st century. It replaced the former social security number that was created using a simple algorithm based on the family name, the sex and the date of birth of a person. Thus, it did not guarantee anonymity. The Central Compensation Office (CCO) is in charge of the attribution of this number. The NAVS13 is needed to be able to work in Switzerland and frequently requested when dealing with authorities and administrative offices for purposes such as getting insurance, benefits or health care. Therefore even undeclared migrants often have such a number. A number is attributed to every foreign national entering the population (either through immigration or by birth). For statistical purposes, the new identifier is available for anyone who has been living in Switzerland at any time since December 31, 2010⁷.

19. The quality of the PIN is considered good even though some cases of migrants with multiple PINs were reported at the time of the introduction of the NAVS13 in 2008. The matching process also involved validation of this identifier. As some individuals had mistakenly been assigned two different NAVS13, this particular problem had to be taken into account during the matching process. For other individuals there was no NAVS13 available in 2010 when the FSO introduced STATPOP (Population and Household Statistics) which is based on about 2,300 harmonized national and local population registers (see box below). The FSO therefore assigned a temporary number to these individuals which – during the matching process – had to be replaced by the belatedly assigned NAVS13. The validation was time-consuming but successful and resulted in a high-level quality of linkage.

STATPOP

The Population and Households Statistics (STAPOPOP) are part of the surveys conducted annually since 2010 by the FSO within the framework of the Federal Population Census. The statistics provide information regarding the population size and composition at the end of a given year as well as on the population change during the same year.

STATPOP is a register-based survey that relies on official registers of persons of the Swiss Confederation, the cantons and the municipalities. It is not a direct survey of the population, but it uses the personal data which are already recorded in the population or residents' registers. In order to carry out a register-based survey, the local registers, which are kept according to different rules in each canton, had to be harmonized or standardized.

The FSO does not keep and maintain an administrative or statistical population register. It receives individual data from the national and local registers for statistical purposes on a quarterly basis. After having been validated (and if necessary

⁶ 'Numéro AVS à 13 chiffres' or: 13-digit OASI (Old-age and survivor's insurance) number

⁷ Before 2010 most registers used internal identification numbers only.

corrected) the data are then stocked as individual data files and made available for exploitation and analysis.

V. Construction of a longitudinal database

20. The introduction of this personal number marked the beginning of a new era for Swiss statistics with the opportunity to link a wide range of registers and surveys. However, alternative approaches had to be adopted for the (national) register of asylum seekers (AUPER) which was in use from the mid-1980s to 2008. This register contained persons in an ongoing asylum procedure or those provisionally admitted to Switzerland⁸. Once a residence or settlement permit was issued (following recognition of refugee status, but sometimes also as a result of marriage or for humanitarian reasons), these individuals were removed from the AUPER register and subsequently reappeared in the national (and then separate) Central Aliens' Register⁹ (comprising foreign nationals not subject to asylum law). Consequently, it was crucial, in order to have information on the possible 'asylum history' of an individual, to link both registers.

21. Linking both registers using a PIN was not possible for former asylum-seekers who obtained a residence or settlement permit prior to 2008. In those cases a match based on the availability of either non-modifiable variables (i.e. date of birth, sex, nationality at time of arrival in Switzerland) or rarely modifiable variables (place of residence, civil status) in both registers was required. Various attempts were made to optimize the match by applying algorithms that have been described in the scientific literature (e.g. Fellegi and Sunter, 1969). Ultimately, given the special nature and the sometimes mediocre quality of the data in the AUPER register (the place of residence is often missing, nationalities were regularly corrected, etc.), a specific algorithm was programmed. This algorithm takes into account two characteristics in particular: territorial changes and change in nationality of an individual (for example, a Yugoslavian takes on Serbian-Montenegrin nationality, then Serbian nationality) over time. The next step was to consider specific matching rules. Some records may be missing (e.g. a person who received refugee status in 2005 may appear belatedly – up to a few years later – in the Central Aliens' Register). This situation requires matching attempts that allow for a time lag. The matching procedures used the SAS software and are documented elsewhere (Wanner et al., 2016).

22. The outcomes of these matching and linking procedures result in more than a hundred different annual files with a single pseudo-identifier for all used registers¹⁰. The files cover e.g. the population stock at year-end (such as 14 annual files from the Central Aliens' Register for the years 1997 to 2010, or 5 annual files from the harmonized national and local population registers [STATPOP] for the years 2010

⁸ Persons who have been ordered to return from Switzerland to their native countries but in whose cases the enforcement of this order has proved inadmissible (violation of international law), unreasonable (concrete endangerment of the foreign national) or impossible (for technical reasons of enforcement)

⁹ After 2008 officially called the Central Migration Information System

¹⁰ As well as the data from the FSO structural survey

to 2014) or population flows¹¹ (such as 13 files from the Central Aliens' Register for the years 1998 to 2010). Table 1 informs on the number of records in each database. Table 2 provides a description of the main variables that are available in each database. In total, the system includes almost 250,000,000 records referring to 11,500,000 persons, with each of the records containing up to 200 variables.

23. Reconstructing life trajectories becomes simply a matter of combining these different files and the different variables of interest. Certain trajectories may involve a short-term migration (for example, an arrival and departure in a short period of time), while others may cover the entire period examined.

Table 1: Files included in the database (as of August 1, 2017)

Name	Records	Persons
Central Aliens' Register, 1997-2010*, stock of foreign citizens at the end of the year	24,345,519	3,437,758
Central Aliens' Register, 1998-2010*, flow data for foreign citizens**	10,861,392	3,079,723
AUPER Register, 1997-2010*, stock of asylum-seekers at the end of the year	2,348,042	327,735
AUPER Register, 1998-2010*, flow data for asylum-seekers**	1,417,334	337,569
STATPOP (extracts from national and local population registers), 2010-2014, population stock at the end of the year	41,320,041	9,077,297
STATPOP (extracts from national and local population registers), 2011-2014, population flow data	10,028,665	3,725,969
Social Security Register, Wages, 2000-2014	121,319,175	6,566,465
Social Security Register, Pensions, 2000-2014	27,984,011	2,430,674
Register of Unemployment	7,044,779	1,976,154
Structural Survey, 2010-2014	1,455,817	1,437,500
Total	248,124,775	11,542,955

* Starting from December 31, 2010, data from the Central Aliens' Register and the AUPER Register are included in STATPOP

** Births, deaths, immigration, emigration, internal migration, naturalizations, changes of permit and other statistical corrections

¹¹ There are four types of flow data: entries into the population, exits from the population, modifications of a person's civil or legal status, administrative corrections.

Table 2: Main variables included in the database (as of August 1, 2017)

Central Aliens' Register & AUPER Register	STATPOP	Social Security Register	Register of Unemployment	Structural Survey
Citizenship	Citizenship	<i>Wages</i>	Professional status	Citizenship
Place of birth*	Country of birth	Month/year of start of receiving wages	Profession	Country of birth
Sex	Sex	Month/year of end of receiving wages	Language skills	Sex
Civil Status	Civil Status	Amount received	Driving license	Civil status
Nationality of the partner**	Household ID		Name and ID number of the last enterprise	Language skills
Reason of migration	Type of household	<i>Pension</i>	Beginning of the period of unemployment	Education achieved
Type of permit	Type of permit	Type of pension	End of the period of unemployment	Learned occupation
Place of residence	Place of residence	Month/year of start of receiving pension		Practiced occupation
	Population type***			Place of work
				Year of arrival
International move	International move			
Internal move	Internal move			
Type of citizenship acquisition	Type of citizenship acquisition			
Birth / Death	Birth / Death			
Change of civil status	Change of civil status			

* Switzerland / abroad ** Swiss / Foreigner *** permanent population, non-permanent population

24. In total, 4.27 million persons of foreign nationality (some of them, however, were naturalized after some years) were included at least once in the Central Aliens' Register or in the local population registers (STATPOP). Almost 700,000 of them were tracked across the entire 1998-2014 period and were thus recorded 18 times at

year- end between December 31, 1997 and December 31, 2014. Furthermore, 6.43 million individuals of Swiss nationality can be found in the harmonized local populations registers (STATPOP). These figures show that precise analyses – at a regional level or for specific groups of migrants – are possible.

25. The database (or an extract of it) is currently being used by 5 different teams of researchers belonging to the 'NCCR on the Move' project who are working in the field of demography, geography, politics, socioeconomics or economy. Each team got access to a part of the information available, according to their specific needs. The whole system is archived at the FSO headquarters.

VI. Calculation of new indicators of integration with a longitudinal approach

26. The aim of the 'NCCR on the Move' project is to characterize and describe new forms of mobility and migration, based on approaches that are complementary to the data and indicators compiled and calculated by the FSO.

27. Swiss legislation on integration serves as a point of reference for the FSO integration indicators. It aims to establish equality of opportunity between nationals and non-nationals in the Swiss society. Art. 2 al.1 of the Ordinance on the Integration of Foreigners (OIE) and Art. 4 and 53 of the Foreign Nationals Act (FNA) state that integration must enable legal long-term foreign residents of Switzerland to participate in the country's economic, social and cultural life.

28. The FSO indicators enable the comparison of statistical results of different population groups, e.g. immigrants (or their descendants) and natives, with regard to access and participation in various areas of societal life (e.g. in the labour market or in terms of health) at a given time. Similar values can be sometimes interpreted as a sign of assimilation but are most often a good sign of integration into the Swiss society.

29. On the contrary, the NCCR Indicators do not measure equal opportunities, but they rather describe the specificities of different groups of migrants or of different cohorts of arrivals. They do not only focus on integration, but they aim at describing the migration trajectories (for instance return migration, naturalization) in a longitudinal perspective.

30. In June 2017 twelve indicators were published by the 'NCCR On the Move' project, four of them having been constructed using longitudinal approaches, the other eight being more traditional indicators of migratory flows. The longitudinal indicators describe the change in residence status, the return (emigration) or the naturalization of a given cohort of immigrants. In the fall of 2017, approximately 15 other indicators will be released, based on a survey of 6,000 migrants that took place in 2016. In 2018, this system of indicators will be completed by longitudinal indicators regarding the labour force participation of migrants, including wages, employment enrolment and level of educational attainment.

31. These longitudinal indicators can be consulted interactively, allowing personal parametrization (see <http://nccr-onthemove.ch/knowledge-transfer/migration-mobility-indicators/>). They are therefore a tool for researchers and policy-makers to better understand migration and integration processes of migrants groups over a longer period of time.

VII. Naturalization and departure rates of migrant cohorts

32. Two examples of such longitudinal indicators developed by the ‘NCCR on the Move’ project are presented below.

33. The first one refers to the naturalization of migrants. In general, the naturalization rate is used as an indicator to compare countries and different migrant groups. Based on this indicator, Switzerland is generally considered to be a rather conservative country with a low level of naturalization. However, the rate is influenced by the duration of stay of foreigners. It can thus provide misleading information, particularly in countries with levels of immigration that vary from one year to another.

34. Therefore, the use of a longitudinal indicator which follows cohorts of immigrants over time seems to be more suitable. The indicator expresses the number of foreign nationals who have obtained Swiss nationality by naturalization as a proportion of all those who immigrated to Switzerland in 1998 and who still lived in the country at the end of 2014. Among them, a total of 6% obtained Swiss nationality after 5 years, and after 10 years 22% had received the Swiss passport. After 16 years (i.e. at the end of 2014) an overall total of 39% of all 1998 immigrants had obtained the national citizenship.

35. Current Swiss law requires 12 years of residence for an ordinary naturalization and 5 years for a facilitated one (which applies mostly to foreigners married to a Swiss citizen). There are important variations in naturalization patterns depending on the country of origin: Immigrants from non-EU/EFTA countries are much more likely to be naturalized than other nationals. After 16 years in Switzerland, fewer than 10% of Danish, Portuguese or Japanese nationals who had arrived in 1998 were naturalized. At the other extreme, approximately two thirds of people from India, Romania, Russia and Thailand had obtained Swiss nationality. Among the main migrant communities (France, Germany, Italy), approximately one quarter of 1998 immigrants still living in Switzerland in 2014 had become Swiss citizens.

36. The second indicator refers to return migration over time. Once again, the traditional cross-sectional indicators do not provide any information on the proportion of migrants who leave the host country and the proportion of those who settle and stay permanently. With the development of the longitudinal database it is now possible to address not only these questions, but also to identify the factors intervening on the return or on onward migration.

37. The indicator shows the proportion of departures among those who arrived in Switzerland during the year 1998 according to the length of stay. The proportions of return migrants were calculated by dividing the number of people no longer residing in Switzerland at the end of a given calendar year by the total number of 1998 immigrants. After one year 26% had already left Switzerland again. After 5 years of residence 40% had left the country, and after 10 years this proportion increased slightly to 44%. After 16 years (i.e. at the end of 2014), an overall total of about 48% of all 1998 immigrants had emigrated from Switzerland.

38. The proportion of those who left the country after 15 years is extremely high (over 75%) among nationals of Sweden, Canada, China, the United States and Japan. The lowest departure rates (fewer than 10% had left the country) are found among citizens from Kosovo, Serbia and Sri Lanka who generally arrived in the context of

family reunification. Among the main immigrant groups of 1998, 61% of Germans, 53% of Italians and 33% of Portuguese had left Switzerland within 15 years after their arrival. However, the departure rate of EU citizens is higher for those who arrived after Switzerland ratified the bilateral agreements with the EU, specifically the agreement on the free movement of persons which entered into force in 2002¹². This legal development has, thus, contributed to an increased international mobility.

39. Both indicators not only provide new information on naturalization and re-emigration, but they also allow the comparisons of migration-related behaviours according to the origin or the cohort of migrants. They provide new knowledge which is easily understandable and public-oriented. A particular attention was paid to construct and calculate indicators that are complementary to the ones already existing. On-going work aims at expanding the list of indicators by including those referring to the education of migrants and the integration into the labour market.

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¹² The bilateral Agreement on the free movement of persons confers upon the citizens of Switzerland and of the member states of the European Union the right to freely choose their place of employment and residence within the national territories of the contracting parties. See: <https://www.eda.admin.ch/dea/en/home/bilaterale-abkommen/ueberblick/bilaterale-abkommen-1/personenfreizuegigkeit.html>