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The impact of migratory flows on the Swiss labour market. A comparison between in- and outflows

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Abstract

International labour migration in industrialized countries raises numerous questions. A wide range of studies have been published on the impact of immigration on the labour market but only few studies take into account both arrivals (immigrations) and departures (emigrations), rather than only the role of newcomers on the labour market. This paper is based on a Swiss Longitudinal Demographic Database which links data from Population and Household Registers, administrative registers, and surveys. In particular, the Swiss Population Register provides the date of arrival or departure of immigrants/emigrants while the Structural Survey provides information on their characteristics and position on the labour market. Based on these data, this paper compares the socioeconomic characteristics of both immigrants and emigrants arrived in Switzerland during the period 2011-2013 or having left the country during the same period, a time span characterized by a yearly net migration of + 80,000 and a rapid economic growth. In terms of level of education, every category is characterized by a positive net immigration, which is not surprising: the economic growth observed in Switzerland during the period led to a demand on the labour market for both skilled and unskilled migrants. More precisely, migratory flows counterbalanced the erosion of the low and averagely skilled working-age non-migrating population and contributed to approximately one third of the increase in the number of highly skilled workers in the labour market. Concerning the occupations, the impact of the migration balance is highest among managers and sales workers. The paper also demonstrates that the migratory flows contribute to balance the decrease in the low and averagely skilled positions and to partially fulfil the economy's demand for highly skilled workers.

Keywords: Immigrants; international migration; economic impact; labour market

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Introduction

International labour migration in industrialized countries raises numerous questions (Dustmann et al., 2008; Jean and Jimenes, 2007; Stark and Bloom, 1985). But only few studies take into account both arrivals (immigrations) and departures (emigrations), rather than only the flow of newcomers on the labour market (see however Zhao 2000 and Docquier 2014). This situation is surprising given the increasing importance of temporary migration, but can be explained by the lack of data on emigration flows.

In terms of their role in the economy of a country, the comparison between the characteristics of immigrants and emigrants provides information on the impact of net immigration on the age structure and the skills available on the labour market (in terms of education or occupation). It also allows for an understanding of the extent to which international migration is a means to adjust the available labour force to the needs of the economy in a context of structural changes in the labour market and of increasing demand for highly educated workers. If this is the case, labour migration should be characterized by the arrival of skills that are needed and the departure of skills that are not anymore in demand.

Switzerland is a country of migration with almost one foreigner in every four inhabitants, and is therefore an ideal laboratory in which to illustrate the impact of migration on the labour market. At the end of year 2013, according to the Swiss Federal Statistical Office, 1,937 million foreigners lived in Switzerland, representing almost 23% of the total population. Around 29% of the workers in Switzerland are foreigners, which is more than in any neighbouring country (Swiss Federal Statistical Office, 2014).

The aim of this study, which uses original data based on population registers, is to measure the net impact of migration taking into account the socio-professional characteristics of both immigrants and emigrants, and to discuss the extent to which the migratory flows are determined by the Swiss labour market and by other internal or external drivers.

State of the art and hypotheses

With the increase in migratory flows in Europe, a wide range of scientific papers have been devoted to the impact of migrants on the labour market. Most of these provided data on the way immigration affects the labour market outcomes of native workers (See for instance Dustmann et al., 2005 for Britain, Glitz, 2012 for Germany). The studies focused on the immigration impact without taking into account the impact of emigration on the labour market. This is also the case in Switzerland, where the economic impact of labour migration (and in particular of new migrants) was until now only measured by analysing the characteristics of recently arrived immigrants compared to those of natives, in terms of unemployment (for instance Widmer, 2005) or skills (Pecoraro, 2005). Measuring the role of immigration on wages or growth rates using econometric models is another approach which has sometimes been

tested (Gerfin and Kaeser, 2010, Basten and Siegenthaler, 2013). To date, no analysis considering both emigrants and immigrants has been published for Switzerland and this study therefore offers a better understanding of the net impact of migratory flows.

Such approaches have rarely been undertaken in the other industrialized countries. Two studies can however be mentioned. Concerning Canada, Zhao (2000) published an innovative analysis taking into account both flows. Canada has opened its boundaries to workers coming from all over the world and observed an emigration of skills towards the United States. This situation and the availability of data in both countries enabled the characteristics of immigrants entering in Canada and of emigrants leaving towards the United States to be compared. Using different surveys and registers, Zhao (2000) precisely described the characteristics of Canadian emigrants and compared them with those of immigrants. The learnings from this study were limited by the sample size and the difficulty to analyse different data collected with diverse methodologies. However, despite these limitations, Zhao found that Canada suffered during the 1990s from a loss of skilled workers, only partially balanced by the inflow of highly qualified from the rest of the world.

Another interesting study examining macro data referring to 35 OECD countries calculated the impact of both migration flows on wages and employment. It showed a positive impact of immigration, but a negative impact of emigration, on the wages of the less educated natives (Docquier et al., 2014). However, due to the absence of individual data on immigrants and emigrants, the precise impact of migration on the labour market had to be estimated using approaches based on econometric models.

Migratory flows do not modify only the number of inhabitants and the size of the working age population: the characteristics of both immigrants and emigrants can differ and their differences contribute positively to the economy when immigrants better fit than emigrants the demand of the labour market, or negatively when they do not.

Aim of the paper and hypotheses

The recent period was characterized by important migratory flows. The net immigration among the age group 20-64 was respectively 55,800, 58,000 and 67,600 during the years 2011, 2012 and 2013 (Swiss Federal Statistical Office 2014), and therefore the contribution of immigration was highly positive in terms of numbers. During the same period, according to the Swiss Employment Statistics, some professional sectors observed an important increase in the number of positions (in terms of full-time equivalent). From the fourth trimester 2010 to the fourth trimester 2013, the number of positions increased by more than 50,000 (+9.9%) in human health and social services, 30,000 (+9.8%) in specialized, technical and scientific activities, 26,500 (+10.0%) in teaching, 17,300 (+10.2%) in public administration, 13,900 (+11.0%) in information and telecommunications and 11,400 (+3.7%) in

construction. At the same time other sectors lost positions, such as the hotel industry and the food service sector (-14,000, -6.4%). In total, the Swiss economy observed a growth of more than 166,000 jobs during the period under study¹. The question is therefore to understand the extent to which the migratory flows were a means to satisfy the changing demand of the labour market by providing skilled immigrants in the growing sectors. In particular, we aim to ascertain whether there is a relationship between the trends in the professional sectors and the profile of migrants in terms of skills and occupations. The analysis also aims at verifying whether we can observe specific flows for the different levels of education, in other words whether there is a pattern of migration characterized by the situation where some countries provide highly-qualified workers and others provide low-qualified ones. Another well-documented characteristic of the labour market is the increase in the demand of tertiary-educated workers. However, the skills of the working-age population progressively evolve through the entry of the young generation into adulthood and the retirement of old workers. Therefore, in a second part of this paper, we investigate the extent to which the demand for skilled workers is satisfied through the local population or whether migratory flows are a means to regulate the labour market.

Data and methods

We linked the Swiss Population Register, which is exhaustive and provides information on the date of arrival or departure of every person living in Switzerland, with the Structural Surveys 2010, 2011, 2012 and 2013 (Steiner and Wanner, 2015). The Structural Survey is carried out every year and concerns more than 200,000 individuals aged 15 and over. This survey takes place on December 31 and gathers information on demographic, educational, occupational and family dimensions. Once matched, these sources enable one to identify for each person surveyed the date of arrival in Switzerland and the date of departure which follows, if any.

Immigrants were selected on the basis of the Structural Surveys at the end of 2011, 2012 and 2013, linked to the Population Register. A total of 619,351 persons aged 20-64 were interviewed during the 3 years considered, and among these, according to the Population Register, 8063 arrived in Switzerland the year preceding the survey (2819 in 2011 among those surveyed on December 31, 2573 among those surveyed on December 31 2012, and 2671 among those surveyed on December 31 2013). Emigrants were also selected on the basis of the Structural Surveys, but the years 2010, 2011 and 2012 were used (sample size = 648,601). Among the persons surveyed on December 31, 2010, 2185 left Switzerland the year following the Survey, 1865 among those surveyed in 2011 left Switzerland the year after the Survey and finally 1867 among those surveyed in 2012 left Switzerland during the year 2013. Then, a total of 5737 emigrants

¹ Swiss Federal Statistical Office (2014b). Full and part-time jobs are included in these figures.

and 8063 immigrants who moved during the years 2011, 2012 and 2013 were included in the analysis.

The Swiss Federal Office of Statistics (SFOS), which undertakes the Structural Surveys, computes a weight for any individual based on the total population. According to this weight, the yearly average number of immigrants aged 20-64 that were surveyed was 69,217 for the years under study, and that of emigrants was 43,713. Based on the exhaustive Population Register, we can compute the exact numbers of immigrants and emigrants that were recorded during the same period. To be coherent, we have to deduct the number of immigrants arrived in the course of the year who left the country before the end of the year (as they cannot be surveyed at the end of the year) and the number of emigrants who arrived and left the country during the same year (as they cannot be surveyed at the end of the previous year). For the period under study and according to the Swiss Population Register, the average number of immigrants still present at the end of the year is of 112,200, and the average number of emigrants already present at the end of the previous year is of 71,749. The comparison between the weighted number of migrants surveyed and their anticipated number according to the Population Register provides a coverage rate of 61.7% for immigrants and 60.9% for emigrants (Table 1).

Table 1. Anticipated number of immigrants and emigrants (according to the Population Register) and observed number (according to the Structural Surveys) after weighting (20-64 years)

	20-64 years			
	2011	2012	2013	Average
Immigrants recorded in the Population Register	131552	139059	151059	140557
- Still present at the end of the year	110395	109703	116502	112200
- Leaving Switzerland during the year	21157	29356	34557	28357
Weighted number of immigrants according to the Structural Surveys	72582	66735	68333	69217
Rate of coverage (%)*	65.7	60.8	58.7	61.7
Emigrants recorded in the Population Register	75784	81084	83440	80103
- Already present at the end of the previous year	70103	72282	72862	71749
- Arrived during the year	5681	8802	10578	8354
Weighted number of emigrants according to the Structural Surveys	43243	45872	42025	43713
Rate of coverage (%)**	61.7	63.5	57.7	60.9

*Source: Structural Surveys and Population Register. * Computed by dividing the weighted number of immigrants in the Structural Surveys by the immigrants still present at the end of the year; ** Computed by dividing the weighted number of emigrants according to the Structural Surveys by the emigrants already present at the end of the previous year.*

This rather low coverage rate is explained by the fact that like any survey, the Structural Survey fails to reach the more mobile population. In particular, some immigrants who arrived just before the survey are not included in the sample that was selected a few months before the survey. Probably, some future emigrants who received the questionnaire considered it unnecessary to answer it as they planned to leave the country. Language barriers may also have played a role in the under coverage.

The coverage rate begs the question about the representativeness of the data. To check this representativeness, we compared the variables available in both sources (Population Register and Structural Surveys): sex, age structure and citizenship. As far as sex and age are concerned, a similar distribution is observed suggesting a good representativeness of the Structural Surveys with respect to those criteria. However, the Structural Surveys slightly underestimate the immigrants and emigrants aged between 20 and 25. In this age-group, a large proportion of immigrants and emigrants are students, probably more difficult to reach as they often live in shared accommodation or non-family households. Moreover, the Structural Surveys tend to over-represent immigrants from the European Union and the rest of Europe (including Balkan countries) and under-represent non-European immigrants. Swiss emigrants were also over-represented, probably because they were more easily reachable.

To measure the net impact of migration flows on the labour market, and given the different distribution of migrants according to citizenship, we rectified the under-registration of both emigrants and immigrants in the Structural Surveys. This correction was done using a weight factor computed according to sex, citizenship and age, and by dividing the average number of immigrants/emigrants declared in the Population Register by the number recorded by the Structural Surveys. Computed weights vary from 0.95 to 4.77 among Swiss immigrants, 1.11 to 2.91 among foreign immigrants, 0.78 to 3.27 among Swiss emigrants and from 1.16 to 3.37 among foreign emigrants. After this correction, it is assumed that representativeness for age, sex and citizenship is achieved. The underlying hypothesis is that after this adjustment, the representativeness for other dimensions that cannot be controlled, such as education or occupation, is also acceptable.

By applying this ratio to the surveyed immigrants and emigrants, we obtain the migratory balance according to different criteria such as age, education level, or acquired occupation. Moreover, rates of immigration or emigration can also be computed by dividing the number of migrants by the number of persons living in Switzerland. Finally, by comparing the net immigration for each occupation or level of education with the total change observed in the whole population (migrants and non-migrants), the contribution of migration to the changes in the educational or occupational structure of the labour market can be precisely estimated, defined here as impact of net immigration.

Results

Migration flows and human capital

Table 2 shows the number of immigrants and emigrants as well as the net migration according to the highest level of education. Every category of education is characterized by a positive net immigration, which is not surprising given the important level of immigration observed during the years under study. The economic growth observed in Switzerland led to a demand for both skilled and unskilled migrants, and the cumulated migration balance during the three years 2011-2013 ranges from 24,950 (Secondary II education²) to 60,600 (Tertiary education).

Table 2. Average population, immigrants, emigrants and net immigration according to the level of education. Persons aged 20 to 64. 2011-2013.

		Numbers			
		Secondary I	Secondary II	Tertiary	Total
Average population*	Men	383273	1165973	873514	2422759
	Women	500265	1265975	638111	2404350
	Both Sexes	883537	2431948	1511624	4827109
	%	18.3	50.4	31.3	100.0
Immigrants 2011-2013	Men	37923	46663	89692	174278
	Women	34635	42392	80218	157245
	Both Sexes	72557	89056	169910	331523
	%	21.9	26.9	51.3	100.0
In % of the average population		8.2	3.7	11.2	6.9
Emigrants 2011-2013	Men	18690	34006	63177	115873
	Women	17328	30098	46122	93547
	Both Sexes	36018	64104	109299	209420
	%	17.2	30.6	52.2	100.0
In % of the average population		4.1	2.6	7.2	4.3
Net immigration** 2011-2013	Men	19233	12657	26515	58405
	Women	17307	12295	34096	63697
	Both Sexes	36539	24952	60611	122102
	%	29.9	20.4	49.6	100.0
In % of the average population		4.1	1.0	4.0	2.5

Source: Structural Surveys and Population Register. *Average population is obtained by taking into account the average number obtained through the surveys 2011, 2012 and 2013. **Net immigration is the difference between immigrants and emigrants.

² Secondary I education includes primary school and lower secondary education (ISCED2); Secondary II education refers to vocational school (ISCED-3 and ISCED-4); Tertiary education refers to the university level.

Half of the net immigration is attributed to tertiary educated persons, the other half being distributed between secondary I and secondary II educated persons (Table 3). In terms of impacts on the labour market, the immigration of tertiary educated persons during the period under study represented more than 11% of the average population aged 20-64 living in Switzerland and holding a tertiary diploma, meaning that more than one out of ten highly-skilled inhabitants in working-age arrived in Switzerland during the last three years.

After taking into account the emigration of tertiary educated persons, the impact of the highly-skilled migration during the 3 years under study is of 4.3% of the average population. The highest percentage of emigrants is observed in that category too (7.2%), indicating a higher mobility of tertiary educated persons compared to primary or secondary educated persons. It is also interesting to mention that the net immigration of highly qualified migrants is higher among women than men (34,100 versus 26,500), which is not the case for the other levels of education.

The impact of net immigration is also important among the Secondary I education category, indicating an existing demand for low skilled workers: the immigrants of this category represent more than 8% of the total population and, after taking into account emigration, the net immigration still represents 4%. The situation is different for the Secondary II education category, with an impact of net immigration – expressed by the net immigration divided by the total population- of about 1 percent. 50% of the population aged 20-64 years in Switzerland holds a secondary II qualification, which represents 2.4 million individuals, more than 50% of the labour force. This population, resulting from the success of vocational education (in particular apprenticeships) in Switzerland, seems to be sufficient for the labour market.

The contribution of immigration to the three levels of education differs significantly according to the country of origin. Table 3 provides the migratory flows observed for the top-10 countries of immigration during the period under study. The average immigration, emigration and net immigration rates for the three-year period (movements divided by the average population) are also provided.

Portugal is the main provider of low qualified (secondary I) migrants, with a net immigration of 14,600 for the period 2011-2013, following by Kosovo (5500, Table 3). Secondary II level migrants come essentially from Italy and Germany (net immigration respectively: 6600 and 6500). However, the number of immigrants holding a secondary II level of education is much higher among the German immigrants (39,000) than those from Italy (13,500): the former observe a higher likelihood of leaving Switzerland (emigration rate of 5%) than the latter (0.9%). Highly-educated migrants originate from Germany (14,400), France (9400) and Italy (8400). The period under study is also characterized by a net emigration amongst the Swiss citizens for the three levels of education, and amongst United Kingdom and United States citizens with secondary level education.

Table 3. Distribution of immigrants, emigrants and net immigration according to citizenship and level of education. 20-64 years old. 10 top-countries of immigration

	Average population*	Movements 2011-2013 (total)			Annual migration rates***		
		Immigrants	Emigrants	Net immigration**	Immigrants	Emigrants	Net immigration**
Secondary I							
Switzerland	437356	4233	7062	-2830	0.2	0.4	-0.2
Germany	8899	2714	2574	140	7.6	7.2	0.4
France	8511	2386	1598	788	7.0	4.7	2.3
UK	1961	508	721	-213	6.5	9.2	-2.7
Italy	60091	6566	2328	4239	2.7	1.0	1.8
Austria	2160	255	120	136	3.0	1.4	1.6
Portugal	122405	21869	7237	14632	4.5	1.5	3.0
Spain	18700	4933	1317	3616	6.6	1.8	4.8
Kosovo	28212	5808	339	5469	5.1	0.3	4.8
US	564	191	448	-257	8.4	19.8	-11.4
Secondary II							
Switzerland	2036597	19005	26069	-7063	0.2	0.3	-0.1
Germany	80802	22755	16223	6532	7.0	5.0	2.0
France	17347	3864	3496	368	5.6	5.0	0.5
UK	4018	1033	1323	-291	6.4	8.2	-1.8
Italy	83181	9634	3015	6619	2.9	0.9	2.0
Austria	11523	1944	1116	828	4.2	2.4	1.8
Portugal	27216	4638	1624	3014	4.3	1.5	2.8
Spain	17224	2514	560	1953	3.6	0.8	2.8
Kosovo	13679	1819	52	1768	3.3	0.1	3.2
US	1030	497	485	12	12.1	11.8	0.3
Tertiary							
Switzerland	1121932	22568	24958	-2389	0.5	0.6	-0.1
Germany	118184	39044	24670	14373	8.3	5.2	3.0
France	42795	18262	8898	9363	10.7	5.2	5.5
UK	19098	7058	6185	873	9.2	8.1	1.1
Italy	38639	13690	5261	8429	8.9	3.4	5.5
Austria	11330	4179	2231	1947	9.2	4.9	4.3
Portugal	10032	5651	1089	4562	14.1	2.7	11.4
Spain	11601	5582	1770	3812	12.0	3.8	8.2
Kosovo	2588	656	103	553	6.3	1.0	5.3
US	9254	5114	4998	116	13.8	13.5	0.3

Source: Structural Surveys and Population Register. *Average population is obtained by taking into account the average number obtained through the surveys 2011, 2012 and 2013. ** Net immigration is the difference between immigrants and emigrants. ***Computed by dividing the average number of immigrants, emigrants and balance by the average population.

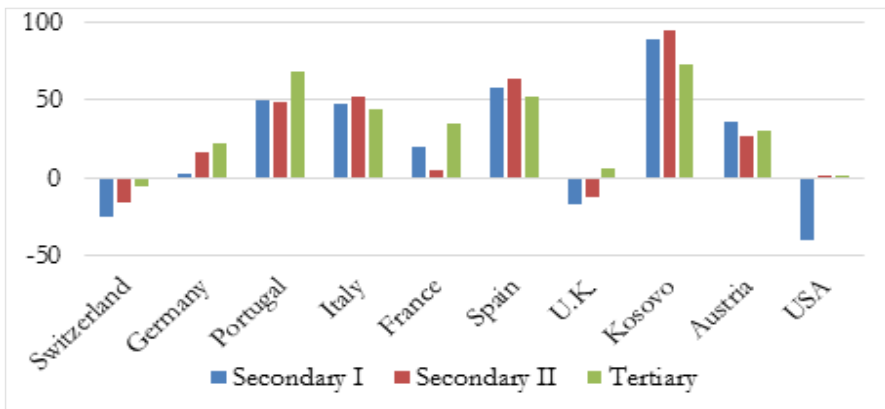
The annual migratory rates provide information on the mobility of every group according to education and citizenship. Not surprisingly, Swiss citizens are less mobile than foreigners. Among the Swiss, those holding a tertiary level of education are the more likely to undertake international migration, followed by those with a secondary I level. Among all foreign groups, the immigration rate for highly educated persons is higher than for those with a secondary level of education.

Results in Table 3 show that some countries such as the Kosovo and the Southern European countries are characterized by an important difference between the number of immigrants and the number of emigrants; other

countries are characterized by flows that are more balanced, although the number of immigrants is almost always higher than the number of emigrants. An index measuring the way migratory flows contribute to the demographic growth of the Swiss population – the efficiency index of the migration – is provided in figure 1: this index is obtained by dividing the migratory balance by the total number of movements (immigrants + emigrants). A value of 0 means that the number of immigrants is equal to the number of emigrants, in other terms that the migratory flows do not impact on the size of the population. A value approaching +100% (or -100%) means that the migratory flows are unidirectional and therefore that every movement impacts positively (or negatively) on the size of the population.

According to this index, the migratory flows to or from Switzerland are almost neutral among the United Kingdom and American citizens, meaning that there is a strong substitution between the newcomers and the persons leaving Switzerland. The same is observed for German citizens holding a secondary I level of education, as well as for French citizens with a Secondary II diploma. By contrast, the efficiency of migration is high among Kosovar citizens, and to a smaller extent among citizens from the Southern European countries, indicating that migratory movements from those countries are mainly immigrations and that the migrations aim at supplementing the labour force rather than substituting emigrants with new immigrants. The other groups in the figure, in particular the citizens from Germany, Austria and France, present a smaller but positive contribution.

Figure 1: Index of efficiency* of the immigration according to the country of citizenship and the level of education



Source: *Structural Surveys and Population Register*. * The index of efficiency is obtained by dividing the net immigration by the total number of movements (immigrants + emigrants)

Almost all groups of professions are characterized by a positive migratory balance: Table 4 shows however that the net immigration is low among skilled agricultural occupations (+1200 persons), clerical support workers (+2800

persons) and plant and machine operators and assemblers (+5700). Conversely, the migratory balance is high among highly qualified professionals (ISCO Group 2, +20,300), as well as among managers, technicians and associate professionals, services and sales workers, craftsmen and related trade workers and elementary occupations (between +10,500 and +14,100). In proportion to the average working population, the net contribution of the migration observed during the years 2011 to 2013 is however highest among the elementary occupations (ISCO Group 9, 1.5%) as well as plant and machine operators and assemblers (0.9%). It is lowest among services and sales workers (0.2%), clerical support workers and skilled agricultural workers (0.4% each). Therefore, results confirm the impact of migratory flows among both low and high-skilled occupations/professions.

Table 4: Immigrants, emigrants and net immigration according to the current occupation (ISCO-Classification). 20-64 years old.

	Average active population*	Movements 2011-2013 (total)			Annual migration rates***		
		Immigrants	Emigrants	Net immigration**	Immigrants	Emigrants	Net immigration
Managers	409991	34322	23165	11157	2.1	1.4	0.7
Professionals	790579	57703	37416	20286	1.8	1.2	0.6
Technicians and Associate Professionals	724919	32160	21654	10506	1.1	0.7	0.4
Clerical Support Workers	355979	11875	9080	2795	0.8	0.6	0.2
Services and Sales Workers	569323	29641	15541	14100	1.3	0.7	0.6
Skilled Agricultural, Forestry and Fishery Workers	81672	2103	895	1208	0.6	0.3	0.4
Craft and Related Trades Workers	424992	22597	9847	12750	1.3	0.6	0.7
Plant and Machine Operators and Assemblers	161480	9067	3409	5657	1.4	0.5	0.9
Elementary Occupations	209233	19597	6939	12658	2.3	0.8	1.5

*Source: Structural Surveys and Population Register. Occupations are classified according to the ISCO code 1998. Military occupations are not included due to the small number of migrants in this group. *Average population is obtained by taking into account the average number obtained through the surveys 2011, 2012 and 2013. ** Net immigration is the difference between immigrants and emigrants. ***Computed by dividing the average number of immigrants, emigrants and net immigration by the average population.*

The contribution of migration to the development of the labour market

During the period under study, Switzerland observed a rapid growth of the labour market with an increase of 4.1% in the number of jobs occupied between the fourth trimester 2010 and the fourth trimester 2014 (Swiss Federal Statistical Office 2014b). This growth was more pronounced in the tertiary than

the secondary sector, and reflected a trend of increased specialisation in the economy, in particular in the economic sector of services, which increasingly requires highly skilled professionals.

The Swiss education system was of course influenced by the increase in job opportunities in some highly qualified professions, motivating the young to attend longer training. At the same time, the progressive retirement of the cohorts of workers born during World War II, who in most cases held secondary I or secondary II diplomas, led to a decrease in the number of low or averagely qualified workers among the non-migrant population. Therefore, the proportion of tertiary-educated persons among the 25-64 year-old population has progressively increased, reaching 40% in 2015 (22% in 1996 – Swiss Federal Statistical Office 2015). At the same time, the share of the lowest educated (Secondary I) and middle-educated persons (Secondary II) among the working age population has decreased.

Of course, the entry into the working age of a new generation which is increasingly qualified, combined with the retirement of older generations, provides local skills for the labour market. However, the migration flows can rapidly offer skills that are urgently needed by the evolving economy. In this context, we aim at verifying the role of migration as a provider of workers in a context of economic changes and labour market development.

Therefore, Table 5 presents the changes in the characteristics of the population aged 20-64 employed in the labour market between the end of 2010 and the end 2013. The specialisation of the economy – which requires increasingly qualified persons – led to a strong increase of workers with a tertiary-education level (+162,000). It also led to a decrease in the number of Secondary I (-15,000) and Secondary II educated (-50,000) workers.

The right hand part of the table shows the role played by the migratory balance on the changes in the labour market. It compares the contribution of the net immigration for the period 2011 to 2013 with the changes observed in the non-migrant (i.e. local) population, and provides the contribution in % of the migratory flows, respectively the “natural” trend of the total change. As the table shows, the non-migrant population holding a Secondary I or Secondary II level of education strongly decreased during the period under study (-42,700 and -70,500 respectively), which can be explained by the aforementioned fact that the young people entering the labour market hold a higher level of qualification than the older workers who are retiring. Migratory flows during the period under study compensated for the strong decrease in numbers observed in these groups, by contributing positively to the population of low and averagely skilled persons.

Over that time span, 29% of the increase in the number of highly qualified working persons was due to the net immigration, and 71% to the increased number of highly qualified among the local working population.

The economy was also characterized during the period 2010 to 2013 by an increase in the number of jobs for all the occupational groups except for clerical

support workers and plant and machine operators and assemblers. Among the local workers, the new requirements of the Swiss economy, the increasing level of education and a lower level of interest for some groups of occupations led to an increase in the number of workers in the highest positions (managers, professionals, technicians and associate professionals) and a decrease in the number of workers in the middle and low occupations. Not surprisingly, the erosion of the offer from the local labour force for those occupations was compensated by migratory flows. The net immigration observed from 2011 to 2013 not only compensated for the reduction in the number of local workers but also enabled an expansion in the number of persons in employment. Conversely, for the highly-skilled occupations, the impact of the net immigration is lower, contributing to 36% of the increase in the number of managers (56% for professionals and 32% for technicians and associate professionals).

Table 5: Population aged 20-64 active on the labour market according to the education level and the current occupation at the end of 2010 and 2013, and distribution of the change according to the migratory status.

	Population aged 20-64 2010	Population aged 20-64 2013	Total change	Immigrants	Emigrants	Net immigration*		Local workers	
						N	% contribution**	N	% contribution**
Education level									
Secondary I	599952	584839	-15113	43784	16231	27553	> 100%	-42666	...
Secondary II	1994259	1944204	-50055	60621	40177	20444	> 100%	-70499	...
Tertiary	1253714	1415493	161779	126183	79698	46485	29%	115294	71%
Total	3847925	3944536	96611	230588	136106	94482	98%	2129	2%
Current occupation									
Managers	415332	447019	31686	36110	24622	11489	36%	20198	64%
Professionals	796213	833608	37395	60709	39769	20940	56%	16455	44%
Technicians and Associate Professionals	743398	777009	33612	33835	23015	10820	32%	22792	68%
Clerical Support Workers	378517	365728	-12789	12493	9651	2842	> 100%	-15631	...
Services and Sales Workers	592179	598179	6000	31185	16518	14667	> 100%	-8667	...
Skilled Agricultural, Forestry and Fishery Workers	85717	85870	153	2213	951	1262	> 100%	-1109	...
Craft and Related Trades Workers	444027	444257	230	23774	10466	13308	> 100%	-13078	...
Plant and Machine Operators and Assemblers	170138	167209	-2930	9539	3624	5915	> 100%	-8845	...
Elementary Occupations	218447	221374	2927	20618	7375	13242	> 100%	-10316	...
Military Occupations	3957	4283	326	111	115	-3	...	330	> 100%
Total	3847925	3944536	96611	230588	136106	94482	> 100%	2129	...

*Source: Structural Surveys and Population Register. Occupations are classified according to the ISCO code 1998. Cross-Border workers are not included. * Net immigration is the difference between immigrants and emigrants. ** The contribution is computed by dividing respectively the net immigration and the change in the number of local workers by the total change.*

Discussion

Switzerland has long been a country of immigration, characterized by a positive impact of migratory flows from the post-war II period until now (Wanner, 2015). A net immigration was observed for the years 2011 to 2013, in particular among the working age category. This situation led to a positive contribution of net immigration to the labour market in terms of skills. For the first time, using original data, this contribution is described precisely by comparing the characteristics of both immigrants and emigrants. Except for

one Canadian study (Zhao, 2000), this study is the first to compare both flows in a country of immigration/emigration, and it contributes to the understanding of relationships between international mobility and the labour market. Compared to Zhao's study (2000), which uses different sources in Canada and the United States to describe the inflows and outflows, our study presents the advantage of being based on a single data source, the Structural Surveys. This enables one to have comparable information regarding in- and out-migrants.

The results refer to the three years under study and are not transferable to other years; however, the period 2011-2013 was characterized by a net immigration that is quite representative of the last 10 years and of the current migratory regime in Switzerland.

The analyses presented in this paper are based on a large sample of immigrants and emigrants (more than 8000 immigrants and 5700 emigrants), which may however be partially biased by the fact that the Structural Surveys find it difficult to reach the most mobile inhabitants. Applying a ratio to correct for this underrepresentation allows the computation of valid measures according to sex, age and citizenship. However, we cannot exclude that the degree of representativeness of the sample varies according to, for instance, the occupational group or the level of education.

This paper shows that not only immigration provided labour for the Swiss economy during the period under study, but also that flows were mainly composed of highly skilled persons. However, even more important, this net immigration of highly educated persons does not cover all the needs of the economy. The larger part of the increase in active persons with tertiary education is covered by the local population, through young Swiss entering the labour market, who are more qualified than the new retirees. Amongst the low and averagely qualified, immigrants are also more numerous than emigrants. The positive contribution of net immigration in these categories counterbalances the erosion of the non-migrant working population and therefore contributes to guarantee the availability of the working force necessary for the elementary and manual occupations. However, the number of workers in these categories is progressively decreasing in Switzerland, which can be explained by the increased orientation of the economy towards the tertiary and more specialized sectors.

The contribution of immigration to the labour market differs according to the country of citizenship. Countries such as Portugal and Kosovo provide poorly qualified immigrants, while other countries, such as Germany, France and Italy ensure the availability of highly qualified workers. However, the contribution of net immigration to the increase in the labour market differs from country to country. Migratory flows of citizens from the Anglo-Saxon countries do not impact on the size of the population, since inflows and outflows are almost equal, signifying a substitution of emigrants by newcomers. Conversely, migratory flows of Southern European citizens and from Kosovo

are characterized by inflows that significantly exceed the outflows, resulting in a positive impact of these flows on the labour market.

Switzerland is characterized by a dual migration regime that is regulated by the Free Movement of Persons Agreement for the UE/EFTA countries and by a restrictive immigration policy for the rest of the world. However, most immigrants are from UE/EFTA countries, which still provide the human capital required by the Swiss economy. In this context, the Free Movement of Persons seems to be an adequate policy as it allows the arrival of specific flows of workers, in terms of skills, that are required by the labour market. This is explained by the fact that migrants generally arrive in Switzerland with a work contract, the labour market being attractive enough to interest potential workers abroad. In terms of policy relevance, our results confirm that the Free Movement of Persons Agreement is an adequate policy to attract required workers in a period of structural change in the labour market.

In conclusion, we can answer positively to the question as to whether active migration from and to Switzerland responds to the demands of the labour market. Migration is largely determined by the economy and its transformation, even if individual determinants and external drivers (such as the economic and political context abroad) certainly also play a role. In Switzerland, the profound changes in the structure of the labour market, described in this paper, and determined on the basis of level of education and the different categories of worker occupations, were made possible through the migratory exchanges. The high demand for highly qualified workers was not covered by the non-migrant population entering the labour market, even though the general level of qualification of native Swiss is progressively increasing. Therefore, highly skilled migration has had a significant positive impact. Moreover, immigration plays a dual role on the labour market by also providing poorly and averagely qualified workers. This highlights the positive impact of net immigration on the economy.

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