

Working Paper Research

December 2022 N° 427

Employment effect of citizenship acquisition:
Evidence from the Belgian labour market

by Souso Bignandi and Céline Piton



Publisher

Pierre Wunsch, Governor of the National Bank of Belgium

Statement of purpose

The purpose of these Working Papers is to promote the circulation of research results (Research Series) and analytical studies (Documents Series) made within the National Bank of Belgium or presented by external economists in seminars, conferences and conventions organised by the Bank. The aim is therefore to provide a platform for discussion. The opinions expressed are strictly those of the authors and do not necessarily reflect the views of the National Bank of Belgium.

The Working Papers are available on the website of the Bank: <http://www.nbb.be>

© National Bank of Belgium, Brussels

All rights reserved.

Reproduction for educational and non-commercial purposes is permitted provided that the source is acknowledged.

ISSN: 1375-680X (print)

ISSN: 1784-2476 (online)

Abstract

This paper investigates whether citizenship acquisition affects immigrants' employment in Belgium. To do so, we rely on a longitudinal database, over the period 2008-2014, coupling administrative data from the Crossroads Bank for the Social Security (CBSS) and survey data from the Labour Force Surveys (LFS). During this period, citizenship was open to all immigrants who have been legally resident for at least 7 years, without any language or integration requirements. This allows us to study naturalisation in a liberalised context, avoiding part of the selection bias. The econometric analysis has been carried out using panel data fixed effects techniques applied to a programme evaluation model. We find that citizenship acquisition increases immigrants' employment by 7 percentage points after naturalisation. This effect persists even after controlling for endogeneity by exploiting an instrument for naturalisation and thus confirms the existence of citizenship premium in Belgium. Furthermore, the analysis by type of employment shows that citizenship has a positive effect on migrants' entrepreneurship as well as on their probability of finding a better and more stable job. Finally, using cross-section administrative data from the CBSS, covering the entire population, we find that citizenship effect is stronger for individuals with a non-EU origin.

Keywords: Employment, Immigration, citizenship, labour market integration, Belgium.

JEL Classifications: J15, J16, J18, J21.

Authors:

Souso Bignandi, (corresponding author), ULiège (HEC-Liege & CEDEM).

e-mail: souso.bignandi@uliege.be

Céline Piton, Economics and Research Department, NBB and Université libre de Bruxelles (SBS-EM, CEBRIG, DULBEA) - e-mail: Céline.Piton@nbb.be

This research was carried out within the framework of the young researchers' programme of the National Bank of Belgium. The authors would like to acknowledge anonymous referees for their fruitful comments. We are also grateful to the Crossroad Bank for Social Security, Statbel and Eurostat for providing us the data. A special thanks to Wouter Gelade for the helpful discussions. The opinions expressed are strictly those of the authors and do not necessarily reflect the views of the National Bank of Belgium, Eurostat, the Crossroad Bank for Social Security, Statbel or any other institution with which one of the authors are affiliated.

Non-technical summary

In recent years, the world has experienced an increase in international migration. Consequently, immigration has become a major policy concern in these receiving countries, notably from a labour market perspective. Indeed, regarding the labour market, studies show that immigrants seem to perform poorly compared to natives. They have higher unemployment rates and earn substantially less than natives. Whereas, as evidenced, a better integration of immigrants into the labour market is beneficial for immigrants themselves as well as for the host country. Labour market integration of immigrants leads to less dependence on the welfare system and has a positive effect on fiscal contributions. Moreover, it leads to greater social cohesion in the host country. Hence, finding an efficient policy to help foreigners to integrate better has become the focus of political as well as academic interest. In this regard, acquiring the host country's citizenship could be an instrument for facilitating immigrant's socioeconomic integration and could help them mitigate their labour market disadvantages.

This paper attempts to shed light on the effect of naturalisation on immigrants' employment. In order to do so, we rely on a Belgian longitudinal database, over the period 2008-2014, coupling administrative data from the Crossroads Bank for Social Security (CBSS) and survey data from the Labour Force Surveys (LFS). During this period, citizenship was open to all immigrants who have been legally resident for at least 7 years, without any language or integration requirements. This allows us to study naturalisation in a liberalised context, avoiding part of the selection bias.

Our findings indicate that naturalised individuals have a chance 7 % points greater of being employed than those who have not naturalised, other things being equal. In addition to this, we find that the effect increases over time after naturalisation. We further test the effect of naturalisation on different type of jobs. Our results indicates that naturalisation has a positive effect on migrants' entrepreneurship as well as on their likelihood of finding a full-time job. Regarding the public sector, a positive effect is found only in the long term.

The citizenship premium varies depending on personal characteristics. While all immigrants benefit from acquiring the Belgian nationality, our results show that the effect is more pronounced for those originating from a non-EU country and in particular from the Maghreb, a group facing the largest obstacles in the labour market. Analysis by level of education points to a larger citizenship premium for low-educated immigrants (at most a lower secondary degree) and high-educated immigrants (tertiary degree) than for the middle-educated ones (upper secondary degree).

TABLE OF CONTENTS

1.	Introduction.....	1
2.	Literature Review	2
3.	Data and descriptive statistics	5
4.	Citizenship acquisition in Belgium.....	9
4.1.	Rules to acquire Belgian citizenship	9
4.2.	International comparison	11
4.3.	Characteristics of people with Belgian nationality.....	12
5.	Baseline analysis - how does naturalisation influence the labour market status of immigrants?.....	14
5.1.	Analysis of the career paths of immigrants who acquired Belgian nationality.....	14
5.2.	Analysis of the effect of naturalisation on the probability of being employed: evidence from the Longitudinal Data.....	15
5.3.	Analysis of the effect of naturalisation on the type of job.....	19
6.	The heterogenous impact of citizenship acquisition: evidence from Cross-Sectional Data....	21
6.1.	By gender.....	22
6.2.	By country of origin.....	23
6.3.	By level of education.....	27
7.	Conclusion.....	28
	References.....	30
	Appendices	35
	National Bank of Belgium - Working Papers Series	37

1 Introduction

This paper attempts to shed light on the effect of naturalisation on first-generation¹ immigrants' employment. In recent years, the world has experienced an increase in international migration. The total number of the first-generation immigrants in OECD countries rose by more than 60%, from 83 to 135 million over the period 2000-2019. In 2019, foreign-born individuals represented more than 10% of the OECD population, 12% on average in the European Union, 14% in the United States, and more than 20% in Australia, Canada and Switzerland (OECD, 2020). Consequently, immigration has become a major policy concern in these receiving countries, notably from a labour market perspective.

Indeed, regarding the labour market, studies show that immigrants seem to perform poorly compared to natives (Borjas, 1994; Kogan, 2006 and Lancee, 2012). They have higher unemployment rates and earn substantially less than natives (Heath and Cheung, 2007; Algan *et al.*, 2010; OECD, 2015). Whereas, as evidenced, a better integration of immigrants into the labour market is beneficial for immigrants themselves as well as for the host country. Labour market integration of immigrants leads to less dependence on the welfare system and has a positive effect on fiscal contributions (Dustmann and Frattini, 2014; NBB, 2020). Moreover, it leads to greater social cohesion in the host country (Freedman *et al.*, 2018; Mastrobuoni and Pinotti, 2015). Hence, finding an efficient policy to help foreigners to integrate better has become the focus of political as well as academic interest. In this regard, acquiring the host country's citizenship could be an instrument for facilitating immigrant's socioeconomic integration and could help them mitigate their labour market disadvantages (OECD, 2011).

Nevertheless, existing studies on the link between naturalisation and employment have so far produced mixed results. Some studies find that naturalisation has a positive effect on the employment of immigrants (Fougère and Safi, 2009; Bevelander and Pendakur, 2012; Engdahl, 2014; Gathmann and Keller, 2018; Peters *et al.*, 2018; Hoxhaj *et al.*, 2020), whereas others do not support the existence of such a citizenship premium (Bevelander and DeVoretz, 2008) or even find a negative effect (Scott, 2008). This mixed result on the relevance of citizenship is often attributed to differences in terms of national context and to the methodological approach used. Indeed, existing studies have used either longitudinal or cross-sectional data to analyse how citizenship affects the economic integration of immigrants. Moreover, literature shows that the impact of citizenship seems to differ across migrants' groups (depending on gender, origin, level of education, etc.), which can therefore lead to an ambiguous aggregate effect. Relying on a novel dataset, this paper contributes to this literature by investigating how and to what extent naturalisation affects the employment of migrants in Belgium, but also to whom citizenship matters the most.

Belgium is a particularly interesting case study. First, it is considered one of the most multicultural countries in the OECD area (Martiniello, 2003), with almost 17% of its population being first-generation immigrants. Nevertheless, it is also one of the worst OECD countries in labour market integration of immigrants, both regarding their (un)employment

¹ A first-generation immigrant is defined in this paper as someone who is born abroad with parents also born abroad.

rate and the gap with respect to natives. Moreover, unlike many other European Union countries, during our study period, Belgium did not impose formal conditions for citizenship acquisition. The only requirement was a minimum legal residence period of 7 years, without any criteria in terms of language knowledge, integration efforts, labour market status or income. In that respect, our study complements the existing literature which extensively focuses on countries that impose strict conditions for naturalisation. In such countries, naturalised immigrants are more likely to be a selected subset, particularly by characteristics for which the survey data do not allow control for. And finally, to the best of our knowledge, there is no empirical study that has fully analysed the effect of citizenship acquisition on the employment of first-generation immigrants in Belgium, while using both longitudinal and cross-sectional data.

We rely on longitudinal data derived from the merging of the 2008 and 2014 ad hoc modules of the Labour Force Survey (LFS) with administrative data taken from the Crossroads Bank for Social Security (CBSS). This linked LFS-CBSS dataset contains detailed information on the labour market situation of immigrants, for all quarters between 2008 and 2014. Combined with the liberal context of citizenship acquisition over that period, this panel dataset allows us to tackle endogeneity issues and to provide a robust estimation of the effect of naturalisation on employment. In the second step, we use cross-sectional administrative data from the CBSS, covering the entire population, to evaluate the heterogeneous impact across different groups of immigrants.

This paper is structured as follows. We start by discussing previous evidence on the effect of citizenship on labour market outcomes of first-generation immigrants. We then present in detail our two databases. Section 4 is devoted to explaining how naturalisation works in Belgium, to positioning it in international comparison and to providing an overview of who is more or less likely to get/ask for Belgian nationality. The first assessment of how naturalisation affects employment is presented in Section 5. Based on longitudinal data, the section shows how career paths are influenced by citizenship acquisition and provides an estimation of the magnitude of the impact of naturalisation on the employment rate as well as on the type of job naturalised immigrants can get. Section 6 analyses to whom naturalisation matters the most depending on gender, country of origin and level of education. The last section concludes our paper.

2 Literature Review

The relationship between citizenship acquisition and the labour market integration of first-generation immigrants has received much attention over the past decades.² This growing interest is explained by the fact that labour market outcomes (such as employment levels, occupational status and wages) significantly differ between immigrants and natives in all

² See among others: Chiswick (1978); Bratsberg *et al.* (2002); Bevelander and Pendakur (2012); Fougère and Safi (2009); Corluy *et al.* (2011); Gathmann and Keller (2018); Peters *et al.* (2018, 2020); Bevelander and Veenman (2006); Scott (2008); Steinhardt, (2012); Engdahl (2014); Hoxhaj *et al.* (2020).

developed countries,³ and Belgium is no exception.⁴ In other words, migrants tend to be disadvantaged in the labour market, as compared to natives.

Indeed, the literature provides some main reasons why first-generation immigrants perform worst in the labour market. First, most first-generation migrants lack mastery of the host country's language,⁵ which is however key to immigrants' socio-economic integration.⁶ Therefore, this lack of language skills negatively affects their labour market outcomes by reducing their employability in many segments of the labour market.

The second reason is linked to immigrants' educational level. Existing studies⁷ suggest that people do not benefit equally from their educational credentials. Given the fact that immigrants' educational credentials obtained in their home countries may not have the same interpretation in terms of skills and productivity in the eyes of employers, the latter will prefer well-known qualifications, i.e. domestic ones. In addition to their educational credentials, immigrants' labour market experience obtained in their home countries, is not or is less valuable in the host country's labour market.⁸

The third is related to the human capital endowment (other than schooling, such as cultural capital or knowledge of the functioning of the labour market, for example). It is well-documented that first-generation immigrants are often less endowed than natives and present different kinds of human capital than those that are needed to successfully integrate into the host country's labour market.⁹ Furthermore, in most countries, due to legal requirements and various restrictive practices, first-generation migrants are excluded from a large proportion of jobs in the labour market (such as jobs in justice, police, and general administration). Finally, due to costs¹⁰ supported by employers when hiring a foreigner, they will prefer to hire a native or an individual with host country citizenship.

In this context of labour market disadvantages, granting citizenship can help migrants to offset these disadvantages and can also be used by policy-makers as a tool to boost migrants' socio-economic integration.

First, citizenship acquisition provides migrants with unrestricted access to the labour market of the host country. Indeed, citizenship allows migrants to access jobs that are reserved for citizens, such as jobs in the public sector and certain regulated professions (such as medicine, architects, notaries). In addition to these restricted jobs, citizenship facilitates access to many public service jobs, self-employed and professional occupations. Besides that, it eliminates barriers to some other jobs that require unrestricted mobility of their employees without any bureaucratic hurdles (Steinhardt, 2012; Poeschel, 2016). This aspect is particularly relevant for non-EU immigrants who need a visa¹¹ to travel inside and outside of Europe. Moreover,

³ See Borjas (1994); Kogan (2006); Lancee (2012); Heath and Cheung (2007); Fleischmann and Dronkers (2010); Yann *et al.* (2010); Chiswick (1978); Baker and Dwayne (1994); Dell'Aringa *et al.* (2015).

⁴ See Corluy and Verbist (2014); HCE (2018); NBB (2020); Piton and Rycx (2021).

⁵ See Van Tubergen and Kalmijn (2005); Heath and Cheung (2007); Isphording (2015).

⁶ See Chiswick (1991); Dustmann and Fabbri (2003); Bleackley and Chin (2010); Lochmann *et al.* (2019).

⁷ See for example Corluy and Verbist (2014); Damas de Matos and Liebig (2014).

⁸ See Heath and Cheung (2007); Chiswick and Miller (2009).

⁹ See Heath and Cheung (2007); Bevelander and Veenman (2008); Algan *et al.* (2010).

¹⁰ Those costs could be administrative or financial but also linked to discriminatory practices, lack of information about productivity, or risk of short-term emigration. See Fougère and Safi (2009); Arrow (1972); Dustmann (2000).

¹¹ Those with a foreign nationality from outside the Schengen agreement

citizenship makes it possible to decrease the administrative costs of hiring a foreigner for employers.¹² In addition, it helps to reduce statistical discrimination faced by foreigners when applying for jobs and provides immigrants with better opportunities in the labour market.¹³

Second, citizenship increases the employability of first-generation migrants. As stated above, employers are unable to fully assess migrants' potential productivity through common indicators, such as educational qualifications and past labour market experiences. For this reason, acquiring the host country's citizenship would be perceived by employers as a signal of migrants' integration and as their commitment to staying in the country. This long-term commitment to stay motivates migrants to increase their investments in education, language knowledge and other country-specific skills.¹⁴ Consequently, it should also increase employers' likelihood to invest in the training of foreign employees.¹⁵ This human capital development should lead to a positive effect on the labour market performance of immigrants.

In addition, citizenship acquisition may facilitate upward professional mobility and lead to higher earnings (DeVoretz, 2006). Moreover, it facilitates access to host country high education institutions and scholarships, and facilitates access to credit or business creation. In some countries, citizenship acquisition is associated with some additional rights such as social benefits and political participation. Hence, through these mechanisms, citizenship can help to overcome barriers to employment and promote the socioeconomic integration of first-generation immigrants.

Empirically, following the seminal work of Chiswick (1978),¹⁶ existing studies generally support the existence of a positive link between citizenship acquisition and labour market outcomes.¹⁷ However, a few studies observe no or even a negative correlation.¹⁸ Finally, it should be noted that the effect of citizenship is not the same for all groups of migrants. Studies suggest that the citizenship premium is stronger for migrants that are the most exposed, vulnerable and who struggle in the labour market – in particular, those from less developed origin countries (Bratsberg *et al.*, 2002; Fougère and Safi, 2009; Peters *et al.*, 2018).

The analysis of the impact of citizenship acquisition on the employment of immigrants in Belgium is scarce. The first empirical estimation has been provided by Corluy *et al.* in 2011. Using the 2008 ad hoc module of the Labour Force Survey, they found that naturalisation is associated with significantly better employment outcomes among immigrants. This effect remains significant even after controlling for years of residence since migration. More recent analyses, broadly analysing the labour market integration of immigrants and using the merged CBSS-LFS database over the period 2008-2014, supports the existence of a citizenship premium in Belgium (HCE, 2018; NBB, 2020; Piton and Rycx, 2021).

Relying on the same database, our paper, thanks to the use of instrumental variables, attenuates the potential endogeneity and self-selection issues often highlighted by the

¹² See Bratsberg *et al.* (2002); Cahuc and Zylberberg (2004); Mazzolari (2009).

¹³ See Duguet *et al.* (2007, 2010); Petit *et al.* (2015); Govind (2020).

¹⁴ See Bevelander and Pendakur (2009); Mincer and Polachek (1974); DeVoretz and Pivnenko (2008).

¹⁵ See Steinhardt (2012); Von Haaren-Giebel and Sandner (2016).

¹⁶ Is one of the first studies and compares wages of foreign-born men with and without U.S citizenship in a cross-sectional framework.

¹⁷ See among others Bratsberg *et al.* (2002); Fougère and Safi (2009); Corluy *et al.* (2011); Bevelander and Pendakur (2012); Steinhardt (2012); Engdahl (2014); Gathmann and Keller (2018); Peters *et al.* (2018; 2020).

¹⁸ See for example Bevelander and DeVoretz (2008); Scott (2008); Bratsberg and Raaum (2011); Engdahl (2011).

literature.¹⁹ Indeed, immigrants who decide to apply for citizenship tend to be the ones that are already better integrated into the host country, and those who end up acquiring the citizenship are also positively selected among all applicants. Focusing on Belgium already by definition reduces this effect since no specific requirements are needed in terms of integration to ask for or to obtain Belgian nationality. Nevertheless, some reverse causality can still be present with people who want to obtain host country citizenship investing more in their (labour market) integration. To overcome this issue, we use the combination of citizenship acquisition rules (minimum legal period of residence of 7 years) and the years since first eligibility for citizenship as an instrument for citizenship. Results remain similar and confirm the existence of a citizenship premium in Belgium.

In addition, we go one step further by analysing not only the citizenship premium in Belgium, but also how it evolves over the years since naturalisation and to what extent it may help to get a higher quality job. We also evaluate which groups of immigrants benefit most from citizenship acquisition.

3 Data and descriptive statistics

To study the impact of naturalisation on the employment of immigrants in Belgium, we rely on two types of data that were gathered from the Crossroads Bank for Social Security (CBSS). The first database is a representative sample providing longitudinal data for all surveyed individuals over every quarter from 2008 to 2014. The second is a cross-sectional aggregate dataset which contains information on the entire population for all the years between 2009 and 2014, without panel information. For the rest of the paper, when the longitudinal database is used, the sources named are ‘CBSS Datawarehouse and Statbel (LFS 2008 and 2014 ad-hoc modules)’; when the data for the entire population is used, the source is ‘CBSS Datawarehouse’ only.

Datasets include both natives and immigrants. Our research question being focused on immigrants only, we first restricted our databases and defined what we will call “first-generation immigrants”. The studied group is therefore defined as all individuals who were born abroad with parents who were not born in Belgium.²⁰ A further distinction can be made between individuals born in an EU country and those born outside the EU. Thanks to different origin groups defined by the Socio-economic Monitoring,²¹ the CBSS also gives eleven groups²² of origin, namely EU14, Other EU countries, EU candidate countries, Other European countries, the Maghreb, Sub-Saharan Africa, the Near and Middle East, Oceania and the Far East, Other Asian countries, North America, and Central and South America.

Both datasets include citizenship information (Belgian or foreign nationality on an annual level), the number of years since citizenship acquisition as well as the number of years of residence in the country. Other personal information is also available, such as gender, age (in

¹⁹ See Bratsberg *et al.* (2002); Fougère and Safi (2009); Peters *et al.* (2018, 2020).

²⁰ Usually in the literature and in provided statistics, data lack information on parents’ country of birth so that a first-generation immigrant is defined as a person born abroad. Here, our dataset allows us to avoid considering people born abroad but with Belgian parents as immigrants.

²¹ See reports 2013, 2015, 2017, 2019.

²² The list of the countries included in each group is provided in Appendix.

5-year tranches), region of residence (Brussels, Flanders, Wallonia), level of education²³ (high, medium, low), type of household²⁴ (married, cohabiting or single, with or without children), as well as the socio-economic position, i.e. employed or not employed. That information is available at a quarterly level for the longitudinal database.

In order to be able to come up with an analysis that is relevant to the labour market, datasets are limited to people aged between 20 and 64, i.e. the working-age population and to people living in Belgium.

The **longitudinal dataset** is based on the samples selected for the 2008 Labour force survey ad-hoc module “Labour market situation of migrants” and the 2014 Labour force survey ad hoc module “Migration and labour market”. Starting from this sample, the CBSS has been asked to provide administrative information for all individuals over every quarter from 2008Q1 to 2014Q4 (28 quarters). The dataset therefore contains longitudinal information for the 49,091 individuals surveyed.

Among them, 6,212 people are defined as first-generation immigrants. Focusing on working-age population (20-64 years) and people living in the country restricts the sample to 4,918 individuals, for whom we have 118,195 observations. This means that not everyone was observed during the 28 quarters. This is due to the fact that some people were outside the working age during some quarters (e.g. younger than 20 at the beginning of the period, older than 64 at the end of the period). For some of them, they also (temporarily) left the country²⁵ or they arrived in Belgium during the period. The minimum number of observations per individual is 4 quarters and the maximum is 28. On average, a person is observed during 24 quarters.²⁶

While the sample is constructed to be representative of the population, Statbel usually use weighting coefficients to provide aggregate figures. However, those coefficients are only available for the two quarters of the survey, i.e. 2008Q2 and 2014Q2, so that we cannot use them for our analysis over the entire period. Despite this drawback, Table 1 on naturalisation and Table 2 on people characteristics show us that our longitudinal database is very close to what we found in the population administrative data. Moreover, a major advantage of this dataset is that an individual can be tracked over the period, which makes it possible to provide a robust result on how naturalisation will influence careers and (types of) employment. However, the sample is too small to focus on specific characteristics such as gender, origin or the level of education.

The **population dataset**, provided by the Crossroads Bank for Social Security (CBSS), contains exhaustive administrative information on the entire population over the years 2009 to 2014. The advantage is that it does not relate to a sample and therefore does not entail any representativeness issues. The disadvantage is that an individual cannot be tracked. Therefore, we will use this dataset to analyse the heterogeneous impact of naturalisation,

²³ Note that the level of education differs in both datasets. Data in the population is the level of education registered in administrative data (information provided by the Communities and the Public Employment Services). The one provided in the longitudinal dataset is furnished by the survey and is self-reported by respondent.

²⁴ Only for the population dataset.

²⁵ Over the period, 200 persons (temporarily) left the country.

²⁶ 70% of our sample is observed during the entire period.

estimating the impact for each group separately, without the risk of not having enough observations to provide robust results.

The data is for the situation as at 31 December of the year. For each year, we know the number of people corresponding to all possible cross values of the variables. For example, the data tells us how many men aged between 30 and 34 years old who are living in Brussels, born in an EU country, have a high level of education and are married with children. The dataset includes on average 1,134,958 first-generation immigrants every year, such that we end up with almost 7 million observations.

Table 1
Comparison of both datasets

	Longitudinal dataset	Population dataset
Nb individuals	4,918	1,134,958
Type of observation	Every quarter (min 4, max 28, average 24)	Aggregate information each year
Period	2008-2014	2009-2014
Total nb obs.	118,195	6,809,746
<u>Naturalisation</u>		
Belgian	43%	37%
New Belgian	7.7%	9.5%
Foreigner	57%	63%
Average years since naturalisation	28.3 years	27.9 years

Sources: CBSS Datawarehouse and Statbel (LFS 2008 and 2014 ad-hoc modules), authors' calculations.

As shown in Table 1, longitudinal dataset contains rather more Belgian citizens than we might see in the population (43 against 37%, respectively). This seems to be linked to the slight over-representation of immigrants who are in the country for more than 10 years in the survey, compared to what can be found in administrative data. The difficulty in reaching newcomers to answer a survey may well explain this phenomenon. The average number of years since naturalisation is similar in both datasets and spans 28 years.

Table 2 further provides descriptive statistics on labour market outcomes, personal and household characteristics of first-generation immigrants in our databases. We first see that the share of employed immigrants is low, with less than half of them having a job (compared to 69% for people born in Belgium). Moreover, naturalised immigrants tend to be more often employed than foreigners. While a large share of first-generation immigrants have lived in Belgium for more than 10 years, this proportion largely increases when looking at naturalised immigrants. In other words, on average, immigrants with Belgian citizenship spent more time in the country than immigrants with a foreign nationality.

Regarding the country of origin, 43% of first-generation immigrants were born in an EU country and most of them in one of the EU14. The remaining 57% were born in a country outside the EU, with the largest group of origin being the Maghreb and Sub-Saharan Africa. Based on those proportions, we can see that immigrants with a non-EU origin are over-represented among Belgian citizens (82%), while EU migrants seem to more often keep their home country's citizenship.

Table 2
Descriptive statistics

	Longitudinal dataset			Population dataset			<i>p.m. natives</i>
	Total	Naturalised	Foreigners	Total	Naturalised	Foreigners	
<u>Socio-economic position</u>							
Employed	46%	50%	42%	49%	51%	47%	69%
Not employed	55%	50%	58%	51%	49%	53%	31%
<u>Years of residence</u>							
0-4 years	16%	1%	28%	28%	2%	44%	
5-9 years	19%	11%	25%	13%	11%	15%	
10 years or more	62%	83%	45%	52%	82%	34%	
missing	3%	4%	2%	6%	5%	7%	
<u>Country of birth</u>							
EU14	36%	16%	51%	32%	14%	43%	
Other EU countries	9%	5%	12%	11%	4%	14%	
Other European countries	7%	9%	6%	7%	9%	7%	
EU candidate countries	7%	12%	4%	8%	14%	4%	
The Maghreb	18%	28%	10%	17%	27%	10%	
The Near and Middle East	4%	5%	3%	4%	5%	3%	
North America	1%	0%	1%	1%	0%	1%	
Oceania and the Far East	3%	3%	2%	3%	3%	3%	
Central and South America	3%	4%	3%	3%	4%	3%	
Sub-Saharan Africa	10%	14%	7%	11%	15%	8%	
Other Asian countries	3%	4%	2%	3%	4%	2%	
missing	0.2%	0.0%	0.3%	0.01%	0.01%	0.01%	
<u>Gender</u>							
Men	47%	44%	49%	49%	46%	51%	50%
Women	53%	56%	51%	51%	54%	49%	50%
<u>Age</u>							
20-24	6%	5%	7%	8%	6%	10%	11%
25-29	9%	7%	11%	12%	8%	15%	10%
30-34	12%	9%	14%	14%	10%	16%	10%
35-39	14%	12%	15%	14%	13%	14%	10%
40-44	14%	15%	14%	13%	15%	12%	11%
45-49	13%	15%	11%	12%	14%	11%	12%
50-54	12%	14%	10%	10%	13%	9%	12%
55-59	11%	13%	9%	9%	11%	7%	11%
60-64	10%	10%	9%	7%	9%	6%	10%
<u>Level of education</u>							
At most lower secondary education	37%	41%	34%	18%	23%	16%	11%
Higher secondary education	27%	27%	28%	7%	11%	5%	18%
Tertiary education	27%	23%	29%	11%	11%	10%	16%
missing	9%	8%	9%	64%	55%	69%	56%
<u>Type of household</u>							
Single without children	n.a.	n.a.	n.a.	20%	14%	24%	15%
Single with children	n.a.	n.a.	n.a.	7%	9%	6%	6%
Married without children	n.a.	n.a.	n.a.	11%	11%	12%	16%
Married with children	n.a.	n.a.	n.a.	37%	48%	31%	30%
Unmarried couple without children	n.a.	n.a.	n.a.	5%	2%	7%	7%
Unmarried couple with children	n.a.	n.a.	n.a.	6%	4%	8%	9%
Other type of household	n.a.	n.a.	n.a.	13%	11%	14%	18%

Sources: CBSS Datawarehouse, Statbel (LFS 2008 and 2014 ad-hoc modules), authors' calculations.

There are slightly more women among first-generation immigrants than among natives and this is particularly true for naturalised immigrants. They also tend to be younger and with a lower level of education. The more common type of household is being married with children. While this is also true for natives (30%), the proportion is greater for first-generation immigrants (37%) and still higher for those who are naturalised (48%).

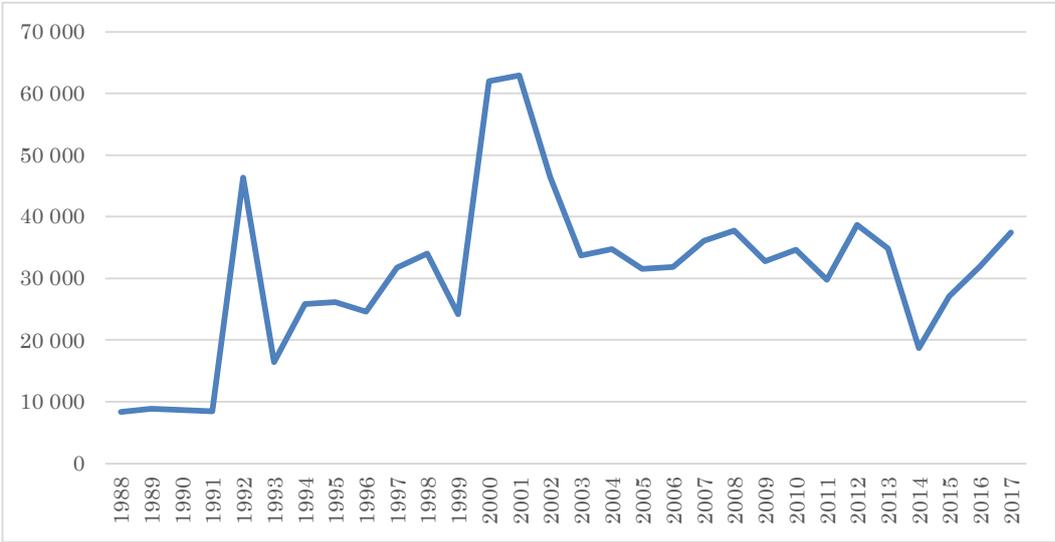
4 Citizenship acquisition in Belgium

Before going more deeply in the analysis of the relationship between citizenship and employment, it is important to provide an overview of the Belgian situation regarding rules for acquiring the Belgian nationality, to compare them with rules that prevail abroad, and also to analyse who is more or less likely to get or to ask for the Belgian nationality. These are the aims of this fourth section.

4.1 Rules to acquire Belgian citizenship

The Belgian Nationality Code²⁷ was created in 1984 and became effective in 1985. Available statistics show two peaks: one in 1992, and the other in 2000 and 2001 (see Figure 1). In 1991, the Code was reformed, so children born in Belgium to parents who were themselves born there could obtain Belgian nationality. The number of 46 368 changes of nationality then peaked in 1992, while the annual average before that date had been around 8 500 (average 1988-1991).

Figure 1 - Number of foreigners acquiring Belgian nationality.
(in persons)



Source: Statbel.

The 2000 reform, known as the “Snel Belg wet” greatly eased the criteria for acquiring Belgian nationality. Before that reform, candidates for naturalisation had to be aged between 18 and 30, born in Belgium and having their main residence there to become Belgian. The

²⁷ For more information, please refer to <http://www.ejustice.just.fgov.be/eli/loi/1984/06/28/1984900065/justel>. See also Corluy *et al.* (2011); Geddes and Niessen (2007); HCE (2018) and Sredanovic (2019).

reform abolished the age limit of 30 years and defined three situations in which it is possible to obtain Belgian nationality: (1) if the person is born in Belgium and has had their main residence there since birth; (2) if the person is born abroad and has one parent with Belgian nationality at the time of the declaration; (3) if the person has been resident for 7 years in Belgium and has an unlimited right of residence. In other words, until 2013, access to citizenship was basically open to all migrants with a minimum period of lawful residence in Belgium. No specific requirements in terms of integration or knowledge of languages had to be fulfilled. However, naturalisation is granted by a parliamentary commission on a case-by-case basis, without public criteria or a right of appeal. Besides this discretionary process, legal residents with at least seven years of residence have the unconditional right to acquire citizenship.

Given this easy access to Belgian citizenship, the proportion of Belgian citizens in the foreign-born population has increased considerably over the period 2000-2013. According to the Belgian National Institute of Statistics, Statbel, this change in the nationality code implies an increase in the number of citizenship changes from 24,196 in 1999 to 62,982 in 2001. This number is then gradually reduced to reach an average of 35,000 acquisitions per years over the period 2002-2013.

In 2013, the Belgian Nationality Code was amended again, but this time the criteria for acquiring nationality were tightened up, reducing the numbers changing their nationality to 18,726 in 2014. The current Code, voted for in 2012, specifies that immigrants must demonstrate their social and linguistic integration and, to some extent, their labour market integration. This recent reform also limited the citizenship acquisition procedure, which involves the Chamber of Deputies, to applications from candidates with exceptional merits. At present, foreigners have to fulfil the following conditions in order to be able to acquire Belgian nationality:

- 1) be at least 18 years old;
- 2) know at least one of the three national languages;²⁸
- 3) provide evidence of social integration;
- 4) have been resident in Belgium for:
 - 5 years if they have worked for at least 468 days, are married to a Belgian, or have a disability preventing them from working;
 - or 10 years if none of the preceding three conditions are satisfied.

There are different ways to fulfil these criteria. For example, having worked for five uninterrupted years before the application can be used by the candidate as proof of their linguistic competence. Yet, obtaining a Belgian degree in one of the national languages can also be used as proof of linguistic integration. Alternatively, candidates who have studied and obtained a degree at a Belgian University can use the years spent obtaining the degree towards the fulfilment of the economic integration requirement. Finally, applicants who have been legally resident in Belgium for at least 10 years, can avoid demonstrating economic integration, but need to provide proof of their participation in the life of the local community.

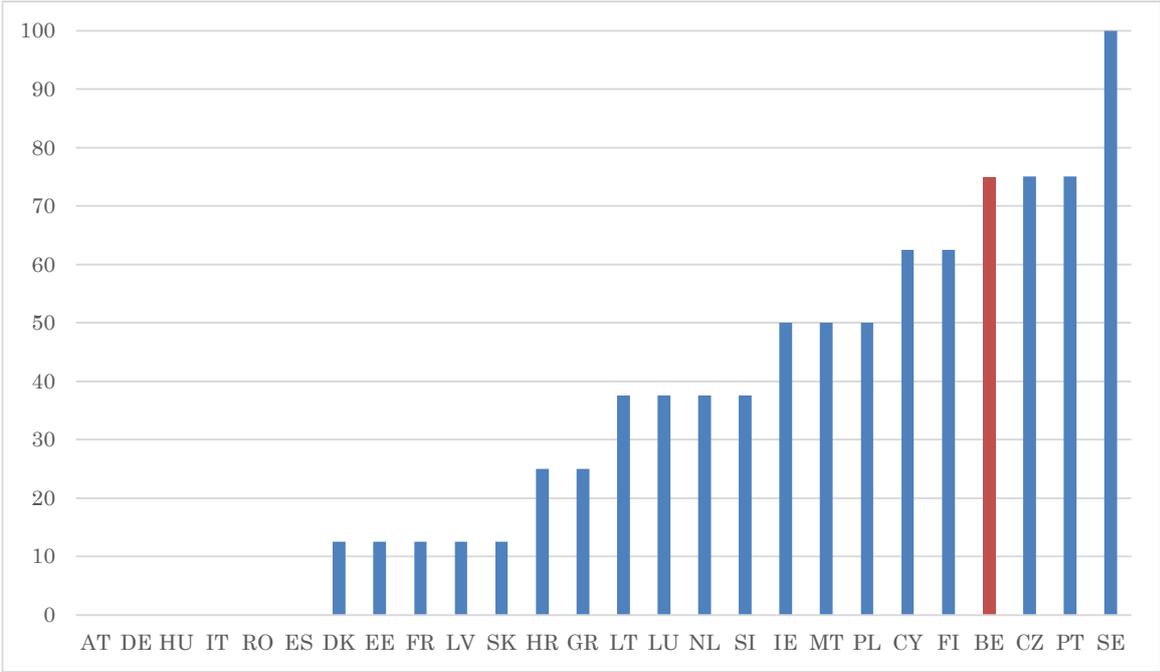
²⁸ French, Dutch or German.

4.2 International comparison

The Migrant Integration Policy Index provides an aggregate indicator per country of the policies that are decided and implemented in order to promote the integration of migrants. All provided indicators range from 0 to 100, a higher level meaning a better policy (or fewer restrictions). It is computed on the basis of almost 300 questions and is aggregated in eight different policy areas, among which access to nationality. This nationality index is based on eligibility criteria (residence conditions, citizenship for immigrant children), on naturalisation requirements (language, integration, economic resources, criminal records) and on the possibility of dual citizenship. Indexes of naturalisation requirements provide a good estimate of the liberal or restricted context regarding expected integration or investment in human capital required before the naturalisation.

As shown in Figure 2, unlike many other European Union countries, during our study period, Belgium did not impose formal conditions for citizenship acquisition (except for criminal records) and was therefore one of the most liberal countries in that respect.

Figure 2 - Naturalisation requirements in international comparison
 (index from 0 to 100, average of language, integration economic resources and criminal records requirements, a higher level means more liberal rules, 2012)



Source: MIPEX.
 Note: The value of the index for AT, DE, HU, IT, RO and ES is zero so that rules are very strict regarding nationality acquisition in those countries.

The only requirement was a minimum legal residence period of 7 years. Yet, there was no requirement in terms of knowledge of languages, integration efforts, labour market status or income. In that respect, our study complements the existing literature, which extensively focuses on countries that impose strict conditions for naturalisation. In such countries, naturalised immigrants are more likely to be a selected subset, particularly for characteristics for which the survey data do not allow control.

4.3 Characteristics of people with Belgian nationality

Over the period studied, an average of 37% of first-generation immigrants had Belgian nationality and every year, almost 2.6% of foreign citizens acquired it. Based on the population dataset,²⁹ we computed a propensity to obtain Belgian citizenship as a function of personal characteristics using a probit regression. The dependent variable is a dummy taking the value of 1 if individual i in year y has the Belgian nationality and 0 otherwise. Explanatory variables include gender, region of residence (Brussels, Flanders, Wallonia), age (by 5 years category), level of education (at most lower secondary education, upper secondary education, tertiary education), type of household (single with or without children, married with or without children, couples with or without children), country of birth (11 groups), number of years of residence and year fixed effects.

The defined model allows for predicted probabilities of being naturalised to be computed for all categories of individuals, maintaining the other characteristics as constants and equal to the mean. Results are presented in Figure 3.³⁰

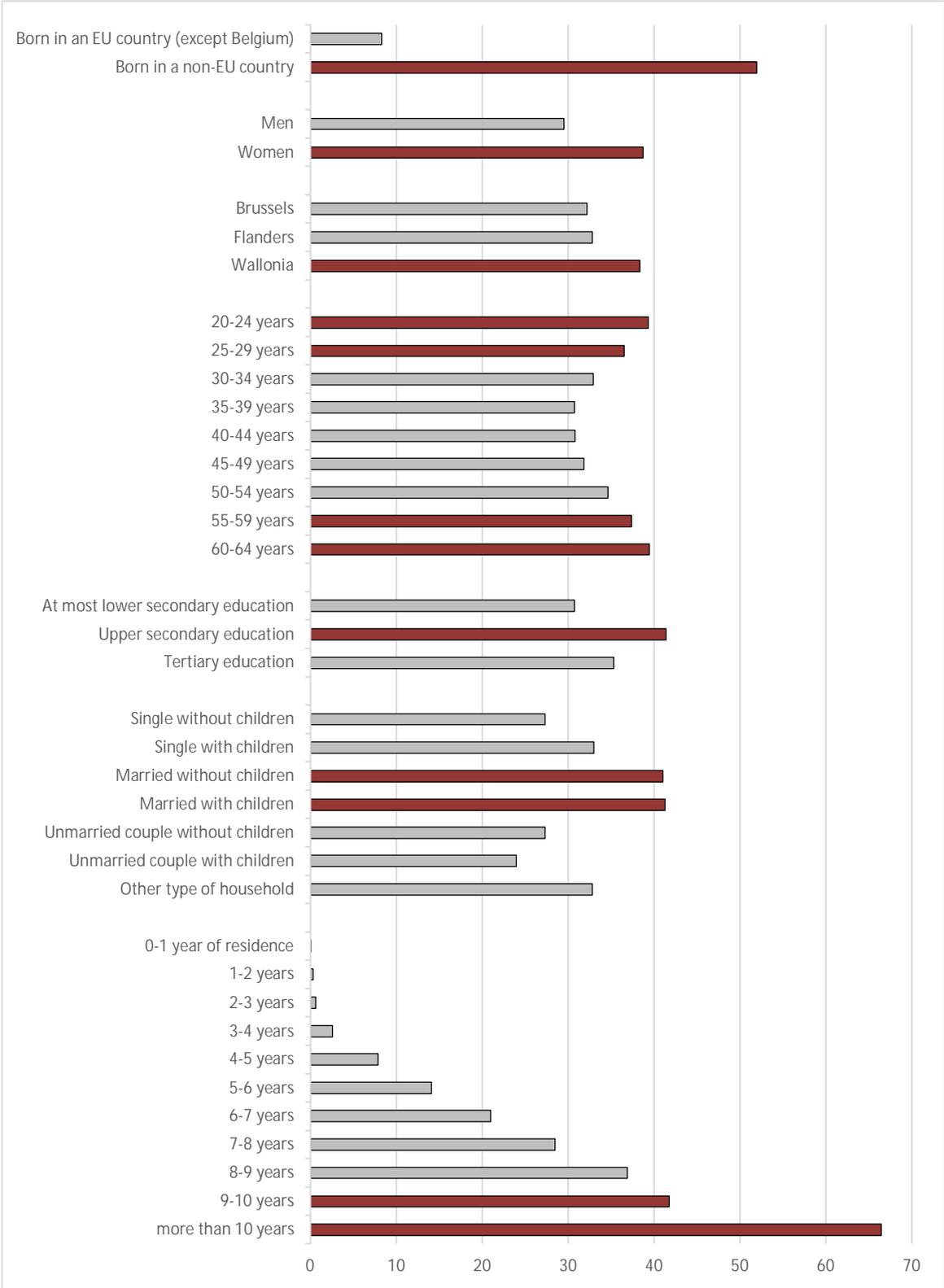
By far, the most important factor influencing the propensity of being naturalised is the country of origin. Non-EU immigrants are much more likely to be naturalised (52%) than EU immigrants (8.3% for total EU, 5.1% for people from EU14 and 27% for people from EU13) and this is true for all detailed groups of origin, except for North America (16%) and other European countries that are not part of the EU (37.4%). Two groups with which Belgium has an international agreement (Schengen and OECD countries).

Regarding other personal characteristics, women are more likely to have Belgian citizenship (39%) than men (30%). Being married also has an influence on the propensity to be naturalised, irrespective of whether or not one has children. The youngest and the oldest get the highest expected probabilities and citizenship acquisition is also largely influenced by the number of years of residence, with almost none of the immigrants getting Belgian nationality during their first few years in the territory. Finally, people with a lower level of education are less likely to be Belgian citizens (31%). The highest probability is observed for middle-educated people (41%) followed by higher-educated (35%).

²⁹ The analysis is made using frequency weights defined as the number of people corresponding to a specific cross value of the variables.

³⁰ Detailed results on the probit regression could be obtained upon request.

Figure 3 - Predicted probability of being naturalised by personal characteristics



Source: CBSS Datawarehouse, authors' calculations.
 Note: Predicted probabilities based on the margins of a probit model controlling for gender, age, region of residence, level of education, type of household, origin, years of residence and year fixed effects. Differences between groups are statistically significant, except between married couples with and without children, between single or unmarried couples without children, between age categories 40-44 and 35-39 and between age categories 60-64 and 20-24.

5 Baseline analysis - how does naturalisation influence the labour market status of immigrants?

In this section, we are going to analyse how citizenship affects migrants' labour market status. To do so, we will rely upon the longitudinal dataset. We first characterise the career paths of immigrants depending on whether or not they acquire Belgian nationality. In the second section, we then measure the extent to which acquiring the host country nationality can increase the employment rate of immigrants. Finally, we go one step further and deeply analyse the effect of naturalisation on the type of jobs taken by immigrants, i.e. whether they tend to work for the public or the private sector, whether they become self-employed and whether they are more likely to work full-time.

5.1 Analysis of the career paths of immigrants who acquired Belgian nationality

Our longitudinal dataset allows us to follow individuals over 28 quarters³¹ and for each of those quarters to know their socio-economic status (i.e. employed, unemployed or inactive). Moreover, detailed information on individuals' citizenship, as well as the year of citizenship acquisition offer a unique opportunity to compare career paths of three different groups: (i) those who are Belgian but who obtained the nationality before the period studied; (ii) people who acquired Belgian nationality between 2008 and 2014; (iii) people with a foreign nationality.

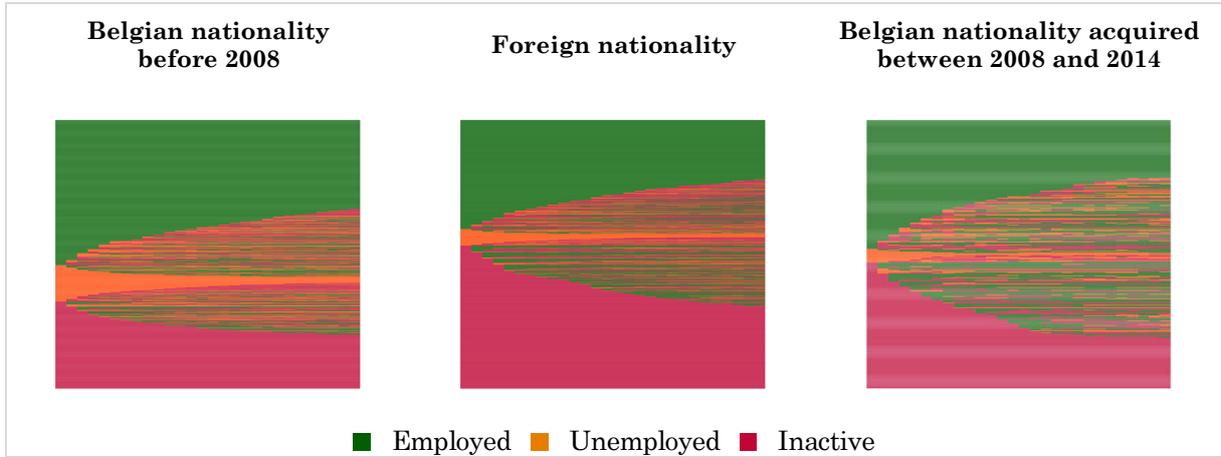
Following Brzinsky-Fay, Kohler and Luniak (2006), we provide a sequence analysis allowing for individuals to be sorted depending on their labour market status. Figure 4 presents the sequence index plots for the three categories of first-generation immigrants. Each line of the graphs represents the career path of one individual. As we can see, the share of employed individuals (green part of the graph) is larger for naturalised immigrants than for foreigners. On average, a first-generation immigrant who acquired Belgian citizenship before 2008, was employed during 15 quarters over the period 2008-2014; for those who acquired the Belgian citizenship during the period studied, the number of quarters as employed is 14.5 and 12.5 for foreigners. This first analysis is therefore already pointing towards a citizenship premium, which becomes larger as the number of years of residence increases.

Note that for all groups the centre of the graph shows a relatively unstable career for many first-generation immigrants. As shown by HCE (2018), using the same database, this feature is specific to immigrants and a much more stable career appears for natives. While citizenship seems to increase the probability of being employed (see also next section), it does not really have an influence on the stability of the career.

³¹ Our dataset being restricted to working-age population, some quarters are missing for individuals if they were not aged between 20 and 64 years over the entire period. Moreover, some immigrants came to Belgium during the period, meaning also that we do not have data for all quarters. For this specific analysis, we focus only on individuals for whom we have all quarters available. This restricts the sample somewhat compared to the descriptive statistics provided in Section 3.

Figure 4 - Career paths of foreign-born individuals by nationality.

(socio-economic status of people aged 20 to 64 years, 2008-2014, each line represents an individual)



Source: CBSS Datawarehouse, Statbel (LFS 2008 and 2014 ad-hoc modules), authors' calculations.

Note: among individuals that we can follow over the entire period, 1,392 individuals have the Belgian nationality and acquired it before the analysed period, 1,660 have a foreign nationality, and 369 acquired the Belgian nationality during the time range (2008-2014).

One advantage of our dataset is that we can identify the moment of the nationality acquisition for the 369 individuals concerned. Given the time range, we can then compute the employment rate over four quarters before it was obtained and three quarters afterwards. On average, in quarter t (corresponding to the Belgian nationality acquisition), 54% of individuals were employed. However, during the four previous quarter, 54% of individuals already had a job, and 52% on average during the three next quarters. This seems to confirm the endogeneity issue, meaning that immigrants who get Belgian citizenship are also those who are initially more integrated or who better invested in human capital specific to the host country.

5.2 Analysis of the effect of naturalisation on the probability of being employed: evidence from the Longitudinal Data

In this section, we investigate how citizenship affects immigrants' employment. Computing the average employment rate for naturalised versus non-naturalised immigrants already shows us a higher level of labour market integration for first-generation immigrants with Belgian nationality (with an employment rate of 50%) than for foreigners (42%). However, to precisely measure the citizenship premium, we estimate the following linear probability model:

$$Empl_{it} = \alpha_0 + \alpha_1 N_{it} + \alpha_2 (N_{it} * YSN_{it}) + \alpha_3 YSM_{it} + \alpha_4 YSM_{it}^2 + \beta X_{it} + \theta_t + c_i + \varepsilon_{it} \quad (1)$$

where the dependent variable $Empl_{it}$ is a dummy variable equal to 1 if individual i is employed at quarter t , and 0 if he/she is either unemployed or inactive. Our variable of interest N_{it} is a dummy variable set to 1 if individual i is naturalised in quarter t and 0 otherwise. YSN_{it} is the variable for years since naturalisation of individual i at quarter t . YSM_{it} is the variable that controls for years since migration of individual i at quarter t . YSM_{it}^2 represents the quadratic form of years since migration. X_{it} is a vector of covariates containing individual

characteristics (such as age or region of residence) varying over time, affecting employment and which may also be correlated with the naturalisation status of immigrants. θ_t represents year-quarter dummies and will control for cyclical effects on the dependent variable and potential time trends (time fixed-effects). c_i represents the individual specific time invariant component of the error term (individual fixed-effects). Finally, ε_{it} is the classical error term.

This model is based on a standard model for Programme Evaluation (see Wooldridge, 2010 p.289). To account for any gradual increase in the probability of employment surrounding the time of naturalisation, we follow Peters *et al.* (2018) and interact naturalisation variable and the number of years since naturalisation.³² Our estimation strategies are based on panel data with individual fixed effect techniques. This method allowed us to control for unobserved individual heterogeneity, such as ability and motivation. However, as we focus on differences within individuals over time, this means that individuals who always or never have employment over the period are excluded from the analysis, since they do not vary on the dependent variable.

In this model, the most important coefficients are α_1 and α_2 . The estimated coefficient α_1 will indicate the one-time boost in the probability of employment after citizenship acquisition. Whereas, estimated α_2 will immediate the gradual effect. A positive estimated α_1 associated to this interaction term (α_2) indicates that the effect of naturalisation increases over time. Whereas a negative α_2 suggests that the probability of being employed increases faster among immigrants who are not (yet) naturalised.

Column (1) in Table 3 summarizes the results from the estimation of equation (2). Overall, it shows that citizenship acquisition is associated with a positive and significant effect on immigrants' employment probabilities. After citizenship acquisition, naturalised migrants have 6.86% points more chance of being employed than those who have not been naturalised, all else constant. Furthermore, the estimated coefficient of the interaction between years since naturalisation and whether a migrant is naturalised or not is positive and statistically significant (+0.25% points). It indicates that the probability of being employed for a naturalised individual increases by 0.25% points per year after naturalisation. For example, 10 years after being naturalised, the probability of being employed is 9.3% points higher than a foreign immigrant (one-time increase of 6.8% points plus 10 times a 0.25% point increase every year). The latter shows that citizenship acquisition increases the probability of employment over time for naturalised migrants.

Beyond these two variables, we also find that years of residence (YSM_{it}) has a positive and statistically significant effect on employment. This indicates that the longer migrants reside in Belgium, the higher their probability of being employed. This is explained by the human capital theory originally developed by Becker (1964). Immigrants' lack of human and cultural capital specific to Belgium may gradually improve with the number of years of residence, for example if they learn the language(s) and how the labour market operates, take training or gain local work experience. Altogether, this could help them to increase their chance of integration into the labour market. However, the relationship is not linear, as evidenced by the estimated coefficient of the quadratic form of years of residence (YSM_{it}^2). The estimated

³² Note that years since naturalisation and years since migration are not perfectly correlated (0.48) which allows us to control for both variables at the same time.

coefficient associated to the quadratic form suggests that the marginal gain of an additional year of residence becomes less and less important as the time spent in Belgium increases.

Table 3
Estimated effect of citizenship acquisition on employment

	Baseline	Eligibility criteria	Min. observations	Instrumental variable
	(1)	(2)	(3)	(4)
Naturalised	0.0686*** (0.0052)	0.0692*** (0.0057)	0.0624*** (0.0055)	0.0707*** (0.0091)
Naturalised*YSN	0.0025*** (0.0002)	0.0027*** (0.0002)	0.0031*** (0.0002)	0.0025*** (0.0003)
YSM	0.0167*** (0.0021)	0.0035 (0.0027)	0.0174*** (0.0022)	0.0167*** (0.0021)
YSM ²	-0.0002*** (0.0000)	0.0001* (0.0000)	-0.0002*** (0.0000)	-0.0001*** (0.0000)
Other covariates	Yes	Yes	Yes	Yes
FE	Yes	Yes	Yes	Yes
Nb. obs.	104,308	79,624	96,592	104,308

Sources: CBSS Datawarehouse, Statbel (LFS 2008 and 2014 ad-hoc modules), authors' calculations. Robust standard errors in parentheses. Statistical significance *** p<0.01, ** p<0.05, * p<0.1. FE includes time, region of origin times region of residence and individual dummies. Other covariates include age categories.

To test the stability of our findings, we perform several robustness checks. First, we perform our main analysis by focusing on individuals who stay long enough to fulfil the eligibility requirement (a minimum of 7 years) and for whom the data does not show empty quarters (for example, if the person temporarily leaves the country). The corresponding estimates, shown in column (2), are similar to those in our baseline regression, with a one-time increase of 6.9% points and an additional 0.27% points per year. However, the coefficient of the variable “years since migration” becomes insignificant, showing that the first few years are key to increasing human capital accumulation and employment, and an additional year of residence is less important after 7 years in the country.

Second, we restrict our sample to individuals who have at least 16 observations (4 years) during our study period. The idea behind this specification is to rule out the fact that our baseline results are driven by individuals with a minor number of observations. The results presented in column (3) seem to invalidate this assumption, since the results are again similar to the baseline regression.

Finally, to reinforce our causal interpretation, we instrumented citizenship acquisition.³³ Our findings so far support the existence of the citizenship premium in Belgium. However, it is

³³ To formally test whether or not citizenship acquisition variable (naturalisation) is endogenous, we follow Wooldridge (2010, pp. 287) and test for strict exogeneity (feedback effect or reverse causality) of citizenship. The F-stat and the p-value associated with the test are respectively 72.81 and 0.0230. Thus, we can reject at 5% level the null hypothesis that the variable naturalisation is strictly exogenous. Furthermore, we test for omitted variable bias using the Ramsey RESET test, under H0: our model has no omitted variables. With an F-stat associated with the test of 124.78 and a p-value of 0.000, we conclude that our model suffers from omitted variable bias. Others tests

possible that our results suffer from the endogeneity issue, and if this is the case then citizenship impact cannot be interpreted as a causal effect. Indeed, the main sources of endogeneity are the unobserved heterogeneity among migrants and the reverse causality. So, we believe that citizenship acquisition is correlated with several other participatory factors, including whether or not an individual is employed. If this is the case, it is conceivable that immigrants who get a job are also likely to become citizens.

In the literature, two types of instruments are more frequently used: years since eligibility³⁴ and the geographical distance between the host country and the origin country.³⁵ Authors who used the first one have assumed that its *ceteris paribus* affects labour market outcomes only by the means of naturalisation because migrants cannot naturalise before they are eligible and so the probability of naturalisation increases with years since eligibility. Instead, the rationale behind the second instrument is that a shorter distance between the origin and the host country decreases the cost associated with return migration and thus decreases the propensity to naturalise (see Yang 1994, p. 473).

Given that in our database, migrants' countries of origin have been categorised into eleven groups of countries, the application of geographical distance as an instrument for citizenship will not be feasible. Instead, we follow Bevelander and Pendakur (2012) and use the product of whether an immigrant is eligible to acquire citizenship or not. More specifically, we use the combination of citizenship acquisition rules (minimum legal period of residence of 7 years) and the years since first eligibility for citizenship as the instrument for citizenship³⁶. The first is a binary variable equal to the unit if the individual is eligible, i.e. has resided in Belgium for at least 7 consecutive years, while the second is a continuous variable. We have assigned a zero value to all ineligible individuals when computing years since first eligibility.

Recall that the information contained in our database allows us to accurately calculate years since first eligibility. As it has been stated in the literature, "different instruments will identify treatment effects for different subgroups, and we will therefore get numerically different treatment effects" (Becker, 2016). For this reason, and also to increase the statistical precision or efficiency of the estimates, looking at several different instruments instead of a single binary instrument for a single treatment was suggested.³⁷ However, combining multiple instruments requires monotonicity assumption (and identical choice behaviour), with a positive first stage. We assume that, all else being constant, our instruments affects employment only by means of naturalisation because individuals cannot naturalise before they are eligible and the probability of naturalisation increases with years since eligibility. Hence, we exploit heterogeneity in naturalisation outcomes generated by our instruments to identify the causal effect on employment.

Before any interpretation of the results obtained, it is worth discussing whether our instruments are relevant and exogenous. Following Staiger and Stock (1997), we tested the relevance of our instruments. The estimated F-stat is about 2878.73 (with a p-value of 0.0000)

not reported (such as Durbin-Wu-Hausman test of endogeneity) have also been implemented. So, to attenuate these two sources of endogeneity, we employed an instrumental variable approach.

³⁴ See Bevelander and Pendakur (2012); Riphahn and Saif (2018).

³⁵ See Just and Anderson (2012, p.99); Peters et al. (2018, 2020).

³⁶ We also test models in which naturalisation is instrumented by the two instruments separately. Results (available upon request) are similar to those presented in the paper.

³⁷ See Imbens and Angrist (1994); Angrist and Pischke (2009, p. 173); Mogstad et al. (2021).

and is well above the threshold of 10. Thus, we conclude that our instruments are good and relevant. Concerning the exogeneity condition, we have tested it using the heteroskedasticity-robust version of the Sargan test, in particular the Hansen J-test. Results show that we cannot reject the null hypothesis that our instruments are exogenous.³⁸ In addition to this exogenous condition, we assume monotonicity. This means that, if individuals are more likely to naturalise given “instrument = eligibility” than “instrument = years since eligibility”, then, people who would naturalise given “instrument = years since eligibility” must also naturalise given instrument = eligibility”. We control for YSM to ensure for the exogeneity of our instrument.

Column (4) presents the results obtained from the IV approach. The estimated coefficient of naturalisation has slightly increased in magnitude compared to the one from our baseline model in column (1).³⁹ This estimated coefficient suggests that citizenship has a strong, positive and significant effect on the probability of being employed, even after controlling for endogeneity. In other words, naturalised migrants enjoy a one-time increase in their employment probability of 7.07% points and an additional 0.25% point rise per year.

5.3 Analysis of the effect of naturalisation on the type of job

So far, we have shown that naturalisation matters, and it has a positive and significant effect on the employment of naturalised individuals. However, our results do not show how this effect affects different types of jobs. We define four types of employment, namely public sector employment, private sector employment, self-employment and full-time employment.

Table 4 presents the results of our estimations. In column (1), our dependent variable, Employment, is equal to 1 if the individual works in the public sector at quarter t , and 0 otherwise. The estimated effect of naturalisation in this column is negative and significant at 5% level, meaning that a naturalised immigrant is 0.42% points less likely to be employed in the public sector just after his/her Belgian nationality acquisition. Nevertheless, it seems that the transition to the public sector takes place years after naturalisation, as evidenced by the estimated coefficient of the interaction between years since naturalisation and whether a migrant is naturalised or not. This coefficient indicates that one year after naturalisation, the probability of employment of a naturalised individual increases by 0.21% points. Another important result in this column is the estimated coefficient of years of residence (YSM), which is not significant. This result shows that, all things being equal, the length of residence of an individual in Belgium does not affect his/her chances of being employed in the Belgian public sector.

A potential explanation of this observation is that immigrants most often enter private sector (and rarely public sector) employment upon arrival, especially in Belgium where there are some restrictions regarding citizenship. So, when they become eligible to naturalise (after having spent a certain time in the country), most of them have already chosen a career path at the time of naturalisation, and this can influence their choices even when they change jobs.

³⁸ Hansen’s J Chi2 (1) = 2.35811 (p-value= 0.1784). This test can be better understood as a test of compatibility of the instruments.

³⁹ We perform a general specification test ala Hausman by comparing the results obtained from the IVs against those from our baseline model. With a critical value of 96.45 and a p-value of 0.000, we can reject the null H0 that “difference in the coefficient is not systematic” and conclude that we were right to use instruments.

Moreover, those restrictions only apply to non-EU foreigners. In fact, by restricting our database to non-EU individuals and re-estimated the effect on employment, our results indicate that naturalised individuals from non-EU countries enjoy a one-time boost of 0.7% points in the probability of employment in the public sector after the citizenship acquisition.

In column (2), we examine to what extent citizenship acquisition helps to obtain a job in the private sector. To do so, we redefine our dependent variable Employment as equal to 1 if the individual is a private sector employee at quarter t , and 0 otherwise. The results reported in this column show that, all else being equal, naturalised immigrant have a greater chance of employment in the private sector compared to their non-naturalised counterparts by 4.57% points. This effect is consistent with the notion that, naturalised immigrants are attractive to employers thanks to reduced administrative cost and the positive signalling. Nevertheless, this one-time boost in employment into the private sector is decreasing over time (-0.09% points per year).

Facing numerous obstacles to entering the labour market, literature shows that immigrants more often opt for a self-employment status to avoid barriers to entry and to set up their own business. We are interested to see to what extent naturalisation can amplify this phenomenon by reducing remaining barriers, namely the administrative ones. Reported results in column (3) show that naturalised immigrants enjoy a one-time boost of 2.7% points in the probability of being a self-employed worker after naturalisation, all else constant. Furthermore, the interaction between years since naturalisation and whether a migrant is naturalised or not is positive and statistically significant. It indicates that the probability of self-employment increases over time for naturalised migrants. According to Mestres (2010), foreign-born entrepreneurs most often face financial constraints and thus through naturalisation, they overcome these constraints, notably through access to credits. Another possible explanation for this effect relates to the conditions for exercising a liberal activity in Belgium. Indeed, non-EU citizens⁴⁰ are required to hold a “professional card” to be allowed to be entrepreneurs. However, obtaining this card is not easy and its application is preconditioned by the right to residence, the compliance with the regulatory requirements and, more particularly, requirements related to the project and its importance to the region. Therefore, citizenship acquisition would avoid all these procedures. This positive effect of citizenship acquisition on entrepreneurial activities can also be explained by the fact that migrants choose self-employment as a means to overcome marginalisation in the host country’s labour market (OECD, 2007, 2008).

⁴⁰ Except EEA citizens and some other categories of foreigners because of the nature of their activities, the nature of their stay, or pursuant to international treaties.

Table 4
Estimated effect of naturalisation on the type of job

	Public sector	Private sector	Self-employed	Full-time job
	(1)	(2)	(3)	(4)
Naturalised	-0.0042** (0.0020)	0.0457*** (0.0049)	0.0270*** (0.0037)	0.0602*** (0.0044)
Naturalised*YSN	0.0021*** (0.0001)	-0.0009*** (0.0002)	0.0013*** (0.0002)	0.0007*** (0.0002)
YSM	0.0007 (0.0008)	0.0106*** (0.0020)	0.0054*** (0.0015)	0.0065*** (0.0018)
YSM ²	-0.00002** (0.00000)	-0.0001*** (0.0000)	0.00001 (0.0000)	-0.0001** (0.0000)
Other covariates	Yes	Yes	Yes	Yes
FE	Yes	Yes	Yes	Yes
Nb. obs.	104,308	104,308	104,308	104,308

Sources: CBSS Datawarehouse, Statbel (LFS 2008 and 2014 ad-hoc modules), authors' calculations. Robust standard errors in parentheses. Statistical significance*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. FE includes time, region of origin times region of residence and individual dummies. Other covariates include age categories and economic sectors.

Finally, in the last column of Table 4, we examine the effect of naturalisation on job quality, by measuring its impact on access to a full-time job. Our dependent variable is therefore equal to 1 if individual i is a full-time employee at quarter t , and 0 otherwise. Results in column (4) indicate that naturalised immigrants have a greater chance of full-time employment by 6.02% points, all else equal, than foreigners. This result confirms the findings of earlier research previous studies that naturalisation may facilitate upward professional mobility and lead to higher earnings or better-paid jobs (DeVoretz, 2006; OECD, 2011). Once again, this positive effect increases over time even if at a lower rate than for public employment or self-employment.

6 The heterogenous impact of citizenship acquisition: evidence from Cross-Sectional Data⁴¹

While previous section highlights the positive impact of naturalisation, this aggregate effect can hide some heterogeneity depending on the characteristics of immigrants. Some groups could benefit more from becoming Belgian citizens and some others a bit less than the average. In order to deeply analyse to whom citizenship matters, one needs to shift to the population dataset that provides exhaustive information even for very small groups. Pooling these independent cross-sections across time will increase our observations and enable us to get more precise estimators and test statistics with more power. Yet, among other things, it rules

⁴¹ Panel data are too restricted in numbers to make an analysis as granular as the one presented in this section. Nevertheless, to test the robustness of our results, we estimated the same specification as in Section 5 for big enough groups. Results are presented in Appendix 2. While magnitude of the coefficients differs, the link of the relationship remains: women are less likely to benefit from naturalisation and non-EU immigrants are more likely to benefit from it.

out correlation in the error terms across different observations (Wooldridge, 2015 p.403). Thus, our estimates in this section will be based on a modified version of equation (2). The individual fixed-effects need to be dropped, since the dataset does not allow for following individuals over time. However, the richness of the information available enables controlling for numerous personal and household characteristics that could influence the employment rate of immigrants. The drawback without the individual fixed-effect is that we do not control for other non-observable or non-available factors, such as ambition to stay, network, language knowledge, etc. Nevertheless, our baseline estimation (see column (1) of Table 5) is close to the one provided in Section 5.2. As a result, we believe that this analysis, while not being of exact magnitude, could allow us to define to whom the effect of citizenship acquisition is more pronounced.

Our linear probability model becomes:

$$Empl_i = \alpha_0 + \beta_1 N_i + \beta_2 (N_i * YSN_i) + \beta_3 YSM_i + \beta_4 HH_i + \beta_5 X_i + \delta_t + \varepsilon_i \quad (2)$$

where our dependent variable $Empl_i$ is a dummy variable equal to 1 if individual i is employed and 0 otherwise. Our variable of interest N_i is a dummy variable set to 1 if individual i is naturalised. YSN_i is the number of years since naturalisation. YSM_i corresponds to years since migration, constructed here as 10 dummies with the last category being 10 years or more. HH_i is the type of household (6 dummies). X_i is a set of covariates of individual i that affect employment and may also be correlated with the naturalisation status of immigrants. These variables include education level (2 dummies), age (8 dummies), origin country (10 dummies), gender, region of residence (2 dummies) and reason for migration (6 dummies). δ_t represents years dummies. These will reflect the fact that the population may have different distributions across our study period. And ε_i represents the error term.

Following the main sources of heterogeneity highlighted in the literature (see section 2), we estimated equation (3) separately by gender, by country of origin and by education level of individuals.

6.1 By gender

As is well documented in labour market studies, women are penalised with respect to their participation, employment and wages (Castellano and Rocca, 2019). Yet, according to NBB (2020), immigrant women are 10% points less likely to be employed than immigrant men. Moreover, in their decomposition between EU and non-EU immigrants, Piton and Rycx (2021) find that foreign-born women of EU origin face a double penalty. In other words, women of EU origin are disadvantaged in the labour market for being both women and immigrants. For those from non-EU origin (except for Sub-Saharan origin, who faces the same penalty as those from the EU), the penalty is even more pronounced. Finally, Bentouhami and Khadhraoui (2018) show that foreign-born women from non-EU origin face the gender gap immediately when entering the labour market.

We investigated whether citizenship acquisition could enable women to compensate for their disadvantages and eventually catch up with their male counterparts. To this end, we estimated equation (3) separately by gender. Table 5 below, shows the results obtained from the estimation. First, the results in column (1) show that on average, naturalised individuals

have 7.15% points chance of being employed than those who have not naturalised, other things being equal. This effect is very significant and close in magnitude to the one obtained using panel data fixed effects techniques in column (1) of Table 1. This effect, even if it does not indicate a causal effect, shows that citizenship has a positive and significant effect on the employment of naturalised individuals.

Table 5
Estimated effects of citizenship acquisition on employment by gender

	Total	Men	Women
	(1)	(2)	(3)
Naturalised	0.0715*** (0.0019)	0.0785*** (0.0028)	0.0612*** (0.0026)
Other covariates	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Nb. obs.	1,328,835	663,156	665,679

Source: CBSS Datawarehouse, authors' calculations.

Robust standard errors in parentheses. Statistical significance*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Other covariates include years since naturalisation, age, origin country, gender (for total regression), region of residence, reason for migration and years since migration. Year dummies include a dummy for all years from 2010-2014, 2009 being the base year. In an alternative regression, we clustered our standard errors at year levels. Coefficients remain statistically significant at 99% despite the increase in standard errors. Difference between men and women coefficients of naturalisation is statistically significant. Estimation using interaction variable shows a smaller impact of -0.0156*** for women compared to men.

The decomposition of the effect of citizenship acquisition on employment between men (column (2)) and women (column (3)) shows that, on average, the effect is higher for men (+7.85% points) than for women (+6.12% points) and the difference is statistically significant. This result indicates that citizenship does not enable naturalised women to match their male counterparts in the Belgian labour market after naturalisation. This result shows that citizenship plays an important role in the integration of women into the labour market, but it is not the only factor that explains the differences in employment, wages or participation between men and women. It should be noted, however, that these differences between men and women may vary across different origins, different levels of education or depending on the type of household. For that reason, in all subsequent sections, we discuss total regression but also men and women separately.

6.2 By country of origin

The literature suggests that the relevance of citizenship is not the same for all migrants (see section 2). Hence, to identify for whom citizenship is most relevant, we perform separate analyses by migrants' countries of origin.

In their study on the heterogeneous employment outcomes of first and second-generation immigrants in Belgium, Piton and Rycx (2021), show that first-generation immigrants face a substantial employment penalty compared to their native counterparts. However, this penalty is more pronounced among those foreign-born from non-EU countries than those from the EU. Deconstructing the penalty across non-EU countries, they find that it is lower for

those born in other Asian and other African countries (-11% and -15% points respectively) and higher for those born in EU candidate countries (-24% points), the Maghreb (-25% points), other European countries (-28% points) and, in particular the Near or Middle East (-36% points). Based on these results, we hypothesise that overall citizenship would matter most for non-EU individuals and more specifically for migrants from countries with the highest penalty rates and lowest employment rates in the Belgian labour market. Indeed, those who are most disadvantaged in the labour market will benefit greatly from citizenship acquisition, as it will enable them to overcome some of their disadvantages.

Table 6
Estimated effects of citizenship acquisition on employment by origin

	EU			Non-EU		
	Total (1)	Men (2)	Women (3)	Total (4)	Men (5)	Women (6)
Naturalised	0.0405*** (0.0053)	0.0426*** (0.0087)	0.0379*** (0.0067)	0.0690*** (0.0021)	0.0729*** (0.0030)	0.0570*** (0.0029)
Other covariates	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Nb. obs.	538,361	247,677	290,684	790,474	415,479	374,995

Source: CBSS Datawarehouse, authors' calculations.

Robust standard errors in parentheses. Statistical significance*** p<0.01, ** p<0.05, * p<0.1. Other covariates include years since naturalisation, age, education level, detailed groups of country of birth, gender (for total regression), region of residence, reason for migration, years since migration and household composition. Year dummies include a dummy for all years from 2010-2014, 2009 being the base year. The difference between coefficients of naturalisation for EU and non-EU origins is statistically significant. Estimation using interaction variable shows a larger impact of +0.0247*** for non-EU origin compared to EU origin. This is however only true for men (+0.0283**), while there is no statistically significant difference between EU and non-EU origins for women (+0.0146).

Table 6 displays the results dividing immigrants into two groups – those born in an EU country and those born in a non-EU country. The results are indicative of the heterogeneity in citizenship effects. First, we can observe that, overall, citizenship acquisition increases immigrants' employment rate. However, as expected, the effect is on average higher for immigrants from non-EU (6.9% points) origin countries than for those from EU countries (4.05% points). This result can be explained by the fact that individuals from non-EU backgrounds face substantial obstacles when it comes to their integration into the Belgian labour market (see HCE, 2018). Thus, acquiring Belgian citizenship could allow them to compensate for these obstacles. In contrast, immigrants from EU countries have almost the same rights and opportunities as Belgian citizens in the labour market. So, they only have small additional benefits from Belgian citizenship acquisition. Moreover, the probability of being in employment for a non-naturalised immigrant from an EU country is over 59% compared to less than 40% for a non-naturalised immigrant from a non-EU origin country. These figures show how difficult it is for non-EU people to find a job in Belgium if they do not have Belgian nationality, in contrast to immigrants from EU countries. Moreover, government jobs are not open to non-EU member country individuals, and the public sector constitutes a large part of employment in Belgium (NBB, 2020). Thus, by acquiring Belgian citizenship, the latter would have unrestricted access to the Belgian labour market and would

therefore increase their probability of being employed. This may explain why the effect is higher for non-EU immigrants.

However, considering that not all migrant groups face the same penalties and that some employers will have preferences for certain groups depending on the levels of risk they attribute to them, we re-estimated equation (3) for all origin groups. We have categorised the origins of migrants into 11 groups. They are: Other European countries, EU candidate countries, Maghreb countries, Near and Middle East, North America, Oceania Far East, Latin America, Other African countries, and Other Asian countries.

Table 7 reports the results of our estimates and is split into three panels. Panel A presents the results of the estimations according to origins in a general way. Panels B and C present the results for men and women, respectively. Firstly, we observe that, on average, the citizenship acquisition positively affects the employment of naturalised people, whatever their origin. However, the magnitude of the effect varies across regions of origin of individuals. This heterogeneity in the effect of naturalisation shows that, the relevance of citizenship for employment is conditioned by the origin context and is consistent with the literature. The highest average effect is observed for individuals from the Maghreb (+8.15% points, column (5) of Panel A) and the lowest effect for those from EU-14 countries (+2.39% points, column (1) of Panel A).

The gender decomposition of the effect shows that, depending on the origin, the effect is not always higher for men than for women. The effect of naturalisation is similar to men or higher than men for women coming from an EU candidate country, Central and South America or Sub-Saharan Africa. Nevertheless, estimating gender differences in the coefficient of naturalisation by origin groups⁴² show that the only statistically significant difference occurs for Other European countries and the Maghreb, with women benefitting less from naturalisation than men.

For men, the highest effect is observed for migrants from the EU-13 (+11% points) and the Maghreb (+8.8%). For women, the largest effect is observed for those from Central and South America (+8.05% points) and Sub-Saharan Africa (+7.13% points). However, due to substantial demographic and institutional differences within these origin groups, we were unable to explain the empirical differences observed between these groups. In order to better understand these differences, and identify the mechanisms that explain them, an analysis that focuses on a specific characteristics of origin countries is worth carrying out.

⁴² Results based on separate regressions by origin groups, but adding an interaction term between naturalisation and gender.

Table 7
Estimated effects of citizenship acquisition on employment by detailed origin

	EU-14	Other EU	Other European countries	EU candidate countries	The Maghreb	The Near and Middle East	North America	Oceania and the Far East	Central and South America	Sub-Saharan Africa	Other Asian countries
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<i>Panel A: Total</i>											
Naturalised	0.0239*** (0.0068)	0.0788*** (0.0088)	0.0533*** (0.0047)	0.0508*** (0.0069)	0.0815*** (0.0041)	0.0407*** (0.0067)	-0.0096 (0.0354)	0.0249** (0.0120)	0.0760*** (0.0106)	0.0701*** (0.0042)	0.0364*** (0.0100)
Nb. obs.	407,673	130,688	130,676	72,608	208,674	71,133	6,879	32,220	43,622	189,701	34,961
<i>Panel B: Men</i>											
Naturalised	0.0287*** (0.0106)	0.1097*** (0.0153)	0.0641*** (0.0072)	0.0415*** (0.0093)	0.0882*** (0.0056)	0.0453*** (0.0086)	0.0176 (0.0518)	0.0366** (0.0170)	0.0717*** (0.0172)	0.0611*** (0.0062)	0.0469*** (0.0169)
Nb. obs.	192,995	54,682	58,006	41,974	126,778	49,294	3,251	14,554	16,934	92,791	11,897
<i>Panel C: Women</i>											
Naturalised	0.0196** (0.0090)	0.0560*** (0.0107)	0.0432*** (0.0063)	0.0440*** (0.0099)	0.0535*** (0.0059)	0.0322*** (0.0103)	-0.0211 (0.0469)	0.0104 (0.0168)	0.0805*** (0.0133)	0.0713*** (0.0057)	0.0284** (0.0123)
Nb. obs.	214,678	76,006	72,670	30,634	81,896	21,839	3,628	17,666	26,688	96,910	23,064
Other covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: CBSS Datawarehouse, authors' calculations.

Note: Robust standard errors in parentheses. Statistical significance*** p<0.01, ** p<0.05, * p<0.1. Other covariates include years since naturalisation, age, education level, gender (for total regressions), region of residence, reason for migration, years since migration and household composition. Year dummies include a dummy for all years from 2010-2014, 2009 being the base year. Taking EU-14 origin as reference group, regression with interaction between naturalisation and origin shows a statistically higher coefficient for other EU countries (+0.052***), the Maghreb (+0.0518***), Central and South America (+0.0473***), Sub-Saharan Africa (+0.0415***), Other European countries (+0.0327***) and EU candidate countries (+0.0258**). Other groups of origin are not statistically different from EU-14 origin. Note that our results might underestimate the employment effect of citizenship for immigrants born in the EU-27 and/or outside the EU such as North American if they are working for international organisations such as NATO or the EU, since they are recorded as inactive in the administrative data.

These results confirm our previous findings that the effect of naturalisation is higher for individuals of non-EU origin countries. On average, individuals from non-EU origin countries have the highest effect. This result is explained by the fact that the latter are those who, in particular, are vulnerable and are struggling in the labour market (Bratsberg et al. (2002); Fougère and Safi (2009), Peters et al. (2018)).

6.3 By level of education

In this section we analyse the effect of educational level on the employment of naturalised persons. In order to do so, we re-estimate equation (3) separately by education level. Table 8 presents the results obtained from our estimations. The results are categorised into three levels of education, namely low, medium and high education. To recap, low-educated individuals have a low secondary education diploma; medium-educated have a certificate of higher secondary education and highly-educated hold a degree in tertiary education.

Table 8
Estimated effects of citizenship acquisition on employment by level of education

	Highly-educated (1)	Middle-educated (2)	Low-educated (3)
<i>Panel A: Total</i>			
Naturalised	0.0688*** (0.0034)	0.0485*** (0.0047)	0.0782*** (0.0027)
Nb. obs.	441,058	214,060	673,717
<i>Panel B: Men</i>			
Naturalised	0.0690*** (0.0049)	0.0493*** (0.0067)	0.0895*** (0.0039)
Nb. obs.	188,357	106,368	368,431
<i>Panel C: Women</i>			
Naturalised	0.0623*** (0.0046)	0.0480*** (0.0064)	0.0618*** (0.0037)
Nb. obs.	252,701	107,692	305,286
Other covariates	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes

Source: CBSS Datawarehouse, authors' calculations.

Robust standard errors in parentheses. Statistical significance*** p<0.01, ** p<0.05, * p<0.1. Other covariates include years since naturalisation, age, origin country, gender (for total regression), region of residence, reason for migration, years since migration and household composition. Year dummies include a dummy for all years from 2010-2014, 2009 being the base year. Differences by level of education are statistically significant for the total regression and for men but not for women. For the total, the interaction terms between naturalisation and level of education show that middle-educated immigrants are less likely to benefit from naturalisation than highly-educated immigrants (-0.0190***), while the low-educated are more likely to benefit from it than the highly-educated (+0.0153***).

Overall, all else constant, we find a positive effect on the employment of naturalised people compared to those who did not naturalise, regardless of the level of education. However, we can observe that this effect is higher among naturalised people with a low level of education.

All else constant, a naturalised person with a low level of education is on average 7.82% points more likely to be in employment than a non-naturalised person with the same level. This probability is +4.85% and +6.88% points, on average, for naturalised individuals with a medium and high level of education, respectively. These figures show that naturalised individuals with a low and high level of education are more likely to find a job quickly than those who naturalised with a medium level of education. In other words, naturalised individuals with a low and high level of education integrate faster into the Belgian labour market than those with a medium level of education. These results can be explained by the fact that middle-educated immigrants are likely to find a low-skilled job more easily, for example in the construction sector, even without Belgian nationality. Nevertheless, for the low-educated, the story is different, since they often face more obstacles and acquiring Belgian nationality can help them by sending a positive signal to employers. Immigrants with a high diploma degree encounter diploma recognition issue which restrict access to some professions. Acquiring Belgian nationality could help for those administrative procedures in diploma recognition or help them reaching the public sector.

7 Conclusion

In this study, we analysed the effect of naturalisation on the employment of naturalised persons. In order to do so, we rely on a longitudinal database, over the period 2008-2014, coupling administrative data from the Crossroads Bank for Social Security (CBSS) and survey data from the Labour Force Surveys (LFS). During this period, citizenship was open to all immigrants who have been legally resident for at least 7 years, without any language or integration requirements. This allows us to study naturalisation in a liberalised context, avoiding part of the selection bias. Of course, some positive selection could still occur. Foreigners who want to apply for citizenship acquisition may be more likely to invest in their (labour market) integration in order to increase their chances of getting Belgian nationality. This is exacerbated by the high discretionary power of authorities and the absence of the right to appeal the decision. Nevertheless, the absence of requirement attenuates this effect and makes Belgium an interesting case to study. Our identification strategy, relying upon instruments (citizenship acquisition rules and years since eligibility), allows us to further reduce the selection bias.

Our analyses indicate that citizenship is relevant for the integration of individuals into the Belgian labour market. The fixed effects estimates, which enable us to account for self-selection concerning unobservable characteristics, show that citizenship acquisition has a positive and significant effect on naturalised immigrants. Our findings indicate that naturalised individuals have a chance 7% points greater of being employed than those who have not naturalised, other things being equal. In addition to this, we find that the effect increases over time after naturalisation. This result is robust to alternative specifications of our empirical model.

We further test the effect of naturalisation on different type of jobs. Our results indicates that except for the public sector, naturalisation increases immigrants' employment immediately after citizenship acquisition. However, the long-term effect is also positive for the public sector. Finally, we show that citizenship has a positive effect on migrants' entrepreneurship as well as on their likelihood of finding a full-time job.

The pooled cross-section analysis based on the data for the entire population suggests that the effect of naturalisation is higher for men than women, after controlling for household composition, education level, years of residence, age, country of origin, region of residence and migration reason. Yet, the large number of observations of this population data enable us to analyse the effect according to eleven migrants' country of origin groups. Results suggest that migrants from non-EU countries are those who benefit most from the effect of naturalisation. Indeed, they are the most vulnerable and disadvantaged group in the Belgian labour market. Hence, the acquisition of Belgian nationality allows them to compensate for their disadvantages in the labour market and thus to increase their probability of being employed. Finally, the analysis according to education level shows that the citizenship premium is higher for individuals with a high and a low level of education than for middle-educated people.

Overall, our findings support the existence of citizenship premium in Belgium, which is increasing over time and allows for a better quality of job. Facilitating access to Belgian nationality seems to break some obstacles encountered by immigrants when searching for a job.

References

- Algan, Y., Dustmann, C., Glitz, A. and Manning, A. (2010). The economic situation of first and second-generation immigrants in France, Germany, and the UK. *The Economic Journal*, 120(542), pp. 4-30.
- Angrist, J. D., and Pischke, J. S. (2009). *Mostly Harmless Econometrics*. Princeton and Oxford: Princeton University Press.
- Arrow, K. J. (1972). Some mathematical models of race discrimination in the labor market. In A. H. Pascal (Ed.), *Economic life* (pp. 187–204). Lexington: D. C. Heath and Company.
- Baker, M. and Dwayne B. (1994). The performance of immigrants in the Canadian labor market. In *Journal of labor economics* 12(3), pp. 369-405.
- Becker G. (1964). *Human Capital: A theoretical and empirical analysis, with special reference to education*, New York: Columbia University Press.
- Becker, S. (2016). Using instrumental variables to establish causality. *IZA World of Labor*: 250.
- Bentouhami H. and Khadhraoui R. (2018), Analyse de la transposition du concept d'intersectionnalité dans le cadre de la réforme des instruments de promotion de la diversité et de lutte contre les discriminations, Center for intersectional justice, Actiris Brussels.
- Bevelander, P. and DeVoretz, D. J. (eds.). (2008). *The Economics of Citizenship*. Malmo: Malmo University, Holmbergs.
- Bevelander, P. and Pendakur, R. (2009). The employment attachment of resettled refugees, refugees and family reunion migrants in Sweden. In Bevelander, P. M. Hagstrom and S. Ronnqvist. *Resettled and Included? The employment integration of resettled refugees in Sweden*. Malmo: Malmo University, pp. 227-245.
- Bevelander, P. and Pendakur, R. (2012). Citizenship, co-ethnic populations, and employment probabilities of immigrants in Sweden. *Int. Migration & Integration*, 13, pp. 203–222.
- Bevelander, P. and Veenman, J. (2006). Naturalization and employment integration of Turkish and Moroccan immigrants in the Netherlands. *Journal of International Migration and Integration*, 7(3), pp. 327–349.
- Bevelander, P. and Veenman, J. (2008). Naturalisation and socioeconomic integration: the case of the Netherlands. In (P. Bevelander and D.J. DeVoretz, eds.), *The Economics of Citizenship*, pp. 63–88, Malmo: Holmbergs.
- Bleackley, H. and Chin, A. (2010). Age at arrival, English proficiency and social assimilation among US immigrants. *American Economic Journal: Applied Economics*, 2, pp. 165-192.
- Borjas, G. J. (1994). The economics of integration. *J. Econ. Literature* 32, pp. 1667–1717.
- Bratsberg, B. and Raaum, O. (2011). The labour market outcomes of naturalised citizens in Norway. In OECD, *Naturalisation: A Passport for the Better Integration of Immigrants?* pp. 183–205, Paris: OECD.

- Bratsberg, B., Ragan, J. F., and Nasir, Z. M. (2002). The effect of naturalization on wage growth: a panel study of young male immigrants. *J. Labor Econ.* 20, pp. 568–597.
- Brzinsky-Fay C., U. Kohler et M. Luniak (2006) “Sequence analysis with Stata”, *The Stata Journal*, 6(4): 435-460.
- Cahuc, P. and Zylberberg, A. (2004). *Labour Economics*. MIT Press, Cambridge.
- Castellano, R. and Rocca, A. (2019). Analyzing the gender gap in European labour markets at the NUTS-1 level, *Cogent Social Sciences*, 5(1), 1595294.
- Chiswick, B. (1978). The effect of Americanization on the earnings of foreign-born men. *J. Political Econ.* 86, pp. 897–921.
- Chiswick, B. (1991). Speaking, reading and earnings among low-skilled immigrants. *Journal of Labor Economics*, 9(2), pp. 149-170.
- Chiswick, B. and Miller, P. (2009). The international transferability of immigrants’ human capital. *Econ. Educ. Rev.* 28, pp. 162–169.
- Corluy, V., Marx I. and Verbist, G. (2011). Employment chances and changes of immigrants in Belgium: the impact of citizenship. *International Journal of Comparative Sociology*, 52(4), pp. 350-368.
- Corluy, V. and Verbist, G. (2014). Can education bridge the gap? Education and the employment position of immigrants in Belgium. *ImPRovE Working Paper*. 14-02, University of Antwerp, Antwerp.
- Damas de Matos, A. and Liebid, T. (2014). The qualification of immigrants and their value in the labour market: a comparison of Europe and the United States. In OECD and EU (eds.), *Matching Economic Migration with Labour Market Needs*, OECD publishing, Paris.
- Dell’Aringa, C., Lucifora, C., and Pagani, L. (2015). Earnings differentials between immigrants and natives: the role of occupational attainment. In: *IZA Journal of Migration* 4.1, p. 8.
- DeVoretz D. (2006). The economics of citizenship: A common intellectual ground for social scientists? *IZA Discussion Paper Series* 2392, IZA, Bonn.
- Devoretz D.J. and Pivnenko S. (2008). The economic determinants and consequences of Canadian citizenship ascension. In: Bevelander P and Devoretz DJ (eds) *The Economics of Citizenship*. Malmö: Holmbergs, 21–62.
- Duguet, E., Leandri, N., L’Horty, Y., and Petit, P. (2007). Discriminations à l’embauche – Un testing sur les jeunes des banlieues d’Île-de-France. *Rapports et documents*. Centre d’analyse stratégique, Paris.
- Duguet, E., Leandri, N., L’Horty, Y., and Petit, P. (2010). Are Young French Jobseekers of Ethnic Immigrant Origin Discriminated against? A Controlled Experiment in the Paris Area. *Annals of Economics and Statistics*, (99/100), 187-215.

- Dustmann, C. (2000). Temporary migration and economic assimilation. Institute for the Study of Labor (IZA), discussion paper, No. 186.
- Dustmann, C. and Fabbri, F. (2003). Language proficiency and labour market performance of immigrants in the UK. In: *The Economic Journal*, 113(489), pp. 695-717.
- Dustmann, C. and Frattini, T. (2014). The fiscal effects of immigration to the UK. *The Economic Journal*, 124(580), pp. 593-643.
- Engdahl, M. (2011). The Impact of Naturalisation on Labour Market Outcomes in Sweden. In *Naturalisation: A Passport for the Better Integration of Immigrants?* pp. 99–130. Paris: OECD.
- Engdahl, M. (2014). Naturalizations and the economic and social integration of immigrants. Working Paper, IFAU - Institute for Evaluation of Labour Market and Education Policy, No. 2014:11.
- Fleischmann, F. and Dronkers, J. (2010). Unemployment among immigrants in European labour markets: an analysis of origin and destination effects. *Work Employment Soc.* 24, pp. 337–354. doi: 10.1177/0950017010362153.
- Fougère, D. and Safi, M. (2009). Naturalization and employment of immigrants in France (1986-1999). *International Journal of Manpower*, 30(1-2), pp. 83-96.
- Freedman M., Owens E., and Bohn, S. (2018). Immigration, Employment Opportunities, and Criminal Behavior. *American Economic Journal: Economic Policy*, 10 (2), pp. 117-51.
- Gathmann, C. and Keller, N. (2018). Access to citizenship and the economic assimilation of immigrants. *Econ. J.* 128, pp. 3141–3181.
- Geddes, A. and Niessen, J. (2007). *European Civic Citizenship and Inclusion Index*. Brussels: British Council.
- Govind, Y. (2020). Is naturalization a passport for better labor market integration? Evidence from a quasi-experimental setting. Working paper.
- Heath, A. and Cheung, S. Y. (eds.). (2007). *Unequal Chances: Ethnic Minorities in Western Labour Markets*. Oxford: Oxford University Press.
- High Council for Employment (2018). *Immigrants Born Outside the European Union on the Belgian Labour Market, Report 2018*, Brussels.
- Hoxhaj, R., Vink, M., and Breuer, T. (2020). Immigrant Naturalisation, Employment and Occupational Status in Western Europe. *Front. Sociol.* 5(70).
- Imbens, G. W., and Angrist, J. D. (1994). Identification and Estimation of Local Average Treatment Effects. *Econometrica* 62 (2): 467–75.
- Isphording, I. (2015). What drives the language proficiency of immigrants?. *IZA World of Labor*, 177, pp. 1-10.
- Just, A. and Anderson, C. J. (2012). Immigrants, citizenship and political action in Europe. *British Journal of Political Science*, 42(3), pp. 481–509.

- Kogan, I. (2006). Labor markets and economic incorporation among recent immigrants in Europe. *Soc. Forces* 85, pp. 697–721.
- Lancee, B. (2012). *Immigrant Performance in the Labour Market: Bonding and Bridging Social Capital*. Amsterdam: Amsterdam University Press.
- Lochmann, A., Rapoport, H., and Speciale, B. (2019). The effect of language training on immigrants' economic integration: Empirical evidence from France. *European Economic Review*, 113, pp. 265-296.
- Martiniello, M. (2003). Belgium's immigration policy. *International Migration Review*, 37(1), pp. 225-232.
- Mastrobuoni, G. and Pinotti P. (2015). Legal status and the criminal activity of immigrants. *American Economic Journal. Applied Economics* 7(2), pp. 175-206.
- Mazzolari, F. (2009). Dual citizenship rights: do they make more and richer citizens? *Demography*, 46, pp. 169–191.
- Mestres, J. (2010), “Entrepreneurship and Employment Creation of Immigrants in OECD Countries”, Chapter 1 in *Open For Business: Migrant Entrepreneurship in OECD Countries*, OECD Publishing, Paris.
- Mincer, J. and Polachek, S. (1974). Family investments in human capital: Earnings of women. *Journal of Political Economy*, 84, pp. 76–108.
- Mogstad, M., Torgovitsky, A., and Walters, C. R., (2021). The Causal Interpretation of Two-Stage Least Squares with Multiple Instrumental Variables. *American Economic Review*, American Economic Association, vol. 111(11), pages 3663-3698, November.
- National Bank of Belgium (2020). *The economic impact of immigration in Belgium*. NBB economic Review, Brussels.
- OECD (2007). *International Migration Outlook*, OECD Publishing, Paris.
- OECD (2008). *International Migration Outlook*, OECD Publishing, Paris.
- OECD (2011). *Naturalisation: A Passport for the Better Integration of Immigrants?*. OECD Publishing, Paris.
- OECD (2015). *International Migration Outlook*, OECD Publishing, Paris.
- OECD (2020). *International Migration Outlook*, OECD Publishing, Paris.
- Peters, F., Schmeets, H., and Vink, M. (2020). Naturalisation and immigrant earnings: why and to whom citizenship matters. *Eur. J. Populat.* 36, 511–545.
- Peters, F., Vink, M., and Schmeets, H. (2018). Anticipating the citizenship premium: before and after effects of immigrant naturalisation on employment. *J. Ethnic Migrat. Stud.* 44, pp. 1051–1080.

- Petit, P., Duguet, E., and L'Horty, Y. (2015). Discrimination résidentielle et origine ethnique: une étude expérimentale sur les serveurs en île-de-France. In: *Economie prévision* 1, pp. 55-69.
- Piton, C. and Rycx, F. (2021). A Broken Social Elevator? Employment Outcomes of First- and Second-Generation Immigrants in Belgium. *De Economist* 169, 319–365.
- Poeschel, F. (2016). Raising the mobility of third-country nationals in the EU. Effects from naturalisation and long-term resident. In *OECD Social, Employment and Migration Working Papers*, No. 187. Paris: OECD.
- Riphahn, R. T. and Saif, S. (2018). Naturalization and labor market performance of immigrants in Germany. *Review of Labour Economics and Industrial Relations*, 33 (1), pp. 48-76.
- Scott, K. (2008). The Economics of citizenship: Is there a naturalisation effect? In *The Economics of Citizenship*, eds P. Bevelander and D. J. DeVoretz (Malmö: Malmö University), pp. 107–126.
- Sredanovic, D. (2019). Barriers to equal treatment of (aspirant) citizens: the case of the application of nationality law in Belgium”, *International Migration*, 58(2), pp. 15-29.
- Staiger, D. and Stock, H. (1997). Instrumental variables regression with weak instruments. *Econometrica*, 65, pp. 557–586.
- Steinhardt, M. F. (2012). Does citizenship matter? The economic impact of naturalizations in Germany. *Labour Economics*. 19, pp. 813–823.
- Van Tubergen, F. and Kalmijn, M. (2005). Destination-language proficiency in cross-national perspective: a study of immigrant groups in nine western countries. *Am. J. Sociol.* 110, pp. 1412–1457.
- Von Haaren-Giebel, F. and Sandner, M. (2016). Naturalisation and on-the-job training: evidence from first-generation immigrants in Germany, *IZA J Migration* 5(19).
- Wooldridge, J. (2015). *Introductory Econometrics: A Modern Approach*, 6th Edition.
- Wooldridge, J. (2010). *Econometric Analysis of Cross Section and Panel Data*. Cambridge, Massachusetts; London, England: The MIT.
- Yang, P. Q. (1994). Explaining immigrant integration. *International Migration Review*, 28(3), pp. 449–477.
- Yann, A., Dustmann, C., Glitz, A., and Manning, A. (2010). The Economic situation of first and second-generation immigrants in France, Germany and the United Kingdom. *Econ. J. Royal Econ. Soc.* 120, pp. 4–30.

Appendix 1: Description of country categories

EU-14: Austria, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

Other EU countries: Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia.

EU candidate countries: Albania, Montenegro, North Macedonia, and Turkey.

Other European countries: Andorra, Belarus, Bosnia and Herzegovina, Island, Liechtenstein, Moldova, Monaco, Norway, Russia, San Marino, Serbia, Switzerland, Ukraine, Vatican City, etc.

The Maghreb: Algeria, Libya, Mauritania, Morocco, and Tunisia.

Sub-Saharan Africa: Burundi, Cameroon, Democratic Republic of the Congo, Rwanda, Senegal, South Africa, etc.

The Near and Middle East: Afghanistan, Bahrein, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Pakistan, Palestine, Qatar, Saudi Arabia, Syria, the United Arab Emirates, and Yemen.

Oceania and the Far East: China, India, South Korea, Japan, Taiwan, Australia, and New Zealand.

Other Asian countries: Australia, China, India, Japan, New Zealand, South Korea, and Taiwan.

North America: Canada, the United States of America.

Central and South America: Argentina, Bolivia, Brazil, Chile, Colombia, Cuba, Ecuador, Guatemala, Mexico, Nicaragua, Peru, Venezuela, etc.

EU: EU-14 + Other EU countries.

Non-EU: EU candidate countries + Other European countries + the Maghreb + Sub-Saharan Africa + the Near and Middle East + Oceania and the Far East + Other Asian countries + North America + Central and South America.

Appendix 2: Heterogenous effect of citizenship acquisition using panel data

Estimated effect of citizenship acquisition on employment by gender and by origin

	Baseline (1)	Gender (2)	Origin (3)
Naturalised	0.0686*** (0.0052)	0.1174*** (0.0062)	0.0333*** (0.0078)
Naturalised*Women		-0.0883*** (0.0059)	
Naturalised*Non-EU origin			0.0465*** (0.0075)
Other covariates	Yes	Yes	Yes
FE	Yes	Yes	Yes
Nb. obs.	104,308	104,308	104,308

Sources: CBSS Datawarehouse, Statbel (LFS 2008 and 2014 ad-hoc modules), authors' calculations.
 Robust standard errors in parentheses. Statistical significance *** p<0.01, ** p<0.05, * p<0.1. FE includes time, region of origin times region of residence and individual dummies. Other covariates include age categories, years since naturalisation, years since migration and years since migration squared.

NATIONAL BANK OF BELGIUM - WORKING PAPERS SERIES

The Working Papers are available on the website of the Bank: <http://www.nbb.be>.

381. "The heterogeneous employment outcomes of first- and second-generation immigrants in Belgium", by C. Piton and F. Rycx, *Research series*, January 2020.
382. "A Dane in the making of European Monetary Union – A conversation with Niels Thygesen", by I. Maes and S. Péters, *Research series*, May 2020.
383. "Multi-product exporters: Costs, prices and markups on foreign vs domestic markets", by Catherine Fuss, *Research series*, June 2020.
384. "Economic importance of the Belgian maritime and inland ports – Report 2018", by I. Rubbrecht and K. Burggraeve, *Document series*, July 2020.
385. "Service characteristics and the choice between exports and FDI: Evidence from Belgian firms", by L. Sleuwaegen and P.M. Smith, *Research series*, July 2020.
386. "Low pass-through and high spillovers in NOEM: What does help and what does not", by G. de Walque, T. Lejeune, A. Rannenberg and R. Wouters, *Research series*, July 2020.
387. "Minimum wages and wage compression in Belgian industries", by S. Vandekerckhove, S. Desiere and K. Lenaerts, *Research series*, July 2020.
388. "Network effects and research collaborations", by D. Essers, F. Grigoli and E. Pugacheva, *Research series*, July 2020.
389. "The political economy of financing climate policy – evidence from the solar PV subsidy programs", by O. De Groot, A. Gautier and F. Verboven, *Research series*, October 2020.
390. "Going green by putting a price on pollution: Firm-level evidence from the EU", by O. De Jonghe, K. Mulier and G. Schepens, *Research series*, October 2020.
391. "Banking barriers to the green economy", by H. Degryse, T. Roukny and J. Tielens, *Research series*, October 2020.
392. "When green meets green", by H. Degryse, R. Goncharenko, C. Theunisz and T. Vadasz, *Research series*, October 2020.
393. "Optimal climate policy in the face of tipping points and asset stranding", by E. Campiglio, S. Dietz and F. Venmans, *Research series*, October 2020.
394. "Are green bonds different from ordinary bonds? A statistical and quantitative point of view", by C. Ma, W. Schoutens, J. Beirlant, J. De Spiegeleer, S. Höcht and R. Van Kleeck, *Research series*, October 2020.
395. "Climate change concerns and the performance of green versus brown stocks", by D. Ardia, K. Bluteau, K. Boudt and K. Inghelbrecht, *Research series*, October 2020.
396. "Daily news sentiment and monthly surveys: A mixed-frequency dynamic factor model for nowcasting consumer confidence", by A. Algaba, S. Borms, K. Boudt and B. Verbeke, *Research series*, February 2021.
397. "A bigger house at the cost of an empty fridge? The effect of households' indebtedness on their consumption: Micro-evidence using Belgian HFCS data", by Ph. Du Caju, G. Périlleux, F. Rycx and I. Tojerow, *Research series*, March 2021.
398. "Low interest rates and the distribution of household debt", by M. Emiriz and F. Koulischer, *Research series*, March 2021.
399. "The interplay between green policy, electricity prices, financial constraints and jobs. Firm-level evidence", by G. Bijmens, J. Hutchinson, J. Konings and A. Saint Guilhem, *Research series*, April 2021.
400. "Economic importance of the Belgian maritime and inland ports – Report 2019", by I. Rubbrecht, E. Dyne and C. Duprez, *Research series*, May 2021.
401. "The return on human (STEM) capital in Belgium", by G. Bijmens and E. Dhyne, *Research series*, July 2021.
402. "Unraveling industry, firm and host-region effects on export behaviors of international new ventures and established exporters", by I. Paeleman, S. A. Zahra and J. W. B. Lang, *Research series*, July 2021.
403. "When trust is not enough: Bank resolution, SPE, Ring-fencing and group support" by M. Dewatripont, M. Montigny and G. Nguyen, *Research series*, August 2021.
404. "Bank specialization and zombie lending", by O. De Jonghe, K. Mulier and I. Samarin, *Research series*, November 2021.
405. "Robert Triffin, Japan and the quest for Asian Monetary Union", I. Maes and I. Pasotti, *Research series*, February 2022.
406. "The impact of changes in dwelling characteristics and housing preferences on house price indices", by P. Reusens, F. Vastmans and S. Damen, *Research series*, May 2022.
407. "Economic importance of the Belgian maritime and inland ports – Report 2020", by I. Rubbrecht, *Research series*, May 2022.

408. "New facts on consumer price rigidity in the euro area", by E. Gautier, C. Conflitti, R. P. Faber, B. Fabo, L. Fadejeva, V. Jouvanceau, J. O. Menz, T. Messner, P. Petroulas, P. Roldan-Blanco, F. Rumler, S. Santoro, E. Wieland and H. Zimmer, *Research series*, June 2022.
409. "Optimal deficit-spending in a liquidity trap with long-term government debt", by Charles de Beaufort, *Research series*, July 2022.
410. "Losing prospective entitlement to unemployment benefits. Impact on educational attainment", by B. Cockx, K. Declercq and M. Dejemeppe, *Research series*, July 2022.
411. "Integration policies and their effects on labour market outcomes and immigrant inflows", by C. Piton and I. Ruysen, *Research series*, September 2022.
412. "Foreign demand shocks to production networks: Firm responses and worker impacts", by E. Dhyne, A. K. Kikkawa, T. Komatsu, M. Mogstad and F. Tintelnot, *Research series*, September 2022.
413. "Economic research at central banks: Are central banks interested in the history of economic thought?", by I. Maes, *Research series*, September 2022.
414. "Softening the blow: Job retention schemes in the pandemic", by J. Mohimont, M. de Sola Perea and M.-D. Zachary, *Research series*, September 2022.
415. "The consumption response to labour income changes", by K. Boudt, K. Schoors, M. van den Heuvel and J. Weytjens, *Research series*, October 2022.
416. "Heterogeneous household responses to energy price shocks", by G. Peersman and J. Wauters, *Research series*, October 2022.
417. "Income inequality in general equilibrium", by B. Bernon, J. Konings and G. Magerman, *Research series*, October 2022.
418. "The long and short of financing government spending", by J. Mankart, R. Priftis and R. Oikonomou, *Research series*, October 2022.
419. "Labour supply of households facing a risk of job loss", by W. Gelade, M. Nautet and C. Piton, *Research series*, October 2022.
420. "Over-indebtedness and poverty: Patterns across household types and policy effects", by S. Kuypers and G. Verbist, *Research series*, October 2022.
421. "Evaluating heterogeneous effects of housing-sector-specific macroprudential policy tools on Belgian house price growth", by L. Coulier and S. De Schryder, *Research series*, October 2022.
422. "Bank competition and bargaining over refinancing", by M. Emiris, F. Koulischer and Ch. Spaenjers, *Research series*, October 2022.
423. "Housing inequality and how fiscal policy shapes it: Evidence from Belgian real estate", by G. Domènech-Arùm, P. E. Gobbi and G. Magerman, *Research series*, October 2022.
424. "Income inequality and the German export surplus", by A. Rannenberg and Th. Theobald, *Research series*, October 2022.
425. "Does offshoring shape labor market imperfections? A comparative analysis of Belgian and Dutch firms", by S. Dobbelaere, C. Fuss and M. Vancauteran, *Research series*, November 2022.
426. "Sourcing of services and total factor productivity", E. Dhyne and C. Duprez, *Research series*, December 2022.
427. "Employment effect of citizenship acquisition: Evidence from the Belgian labour market", S. Bignandi and C. Piton, *Research series*, December 2022.

National Bank of Belgium
Limited liability company
RLP Brussels – Company's number: 0203.201.340
Registered office: boulevard de Berlaimont 14 – BE-1000 Brussels
www.nbb.be

Editor

Pierre Wunsch

Governor of the National Bank of Belgium

© Illustrations: National Bank of Belgium

Layout: Analysis and Research Group
Cover: NBB CM – Prepress & Image

Published in December 2022