

Colussi, T. (2016), "The Impact of the Implementation of Council Directives on Labour Migration Flows from Third Countries to EU Countries", *OECD Social, Employment and Migration Working Papers*, No. 181, OECD Publishing, Paris.

<http://dx.doi.org/10.1787/5jlwxbzkbvfl-en>



OECD Social, Employment and Migration
Working Papers No. 181

The Impact of the Implementation of Council Directives on Labour Migration Flows from Third Countries to EU Countries

Tommaso Colussi

JEL Classification: F22, J61, K37, R23

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The Impact of the Implementation of Council Directives on Labour Migration Flows from Third Countries to EU Countries

Tommaso Colussi (Institute for the Study of Labor)

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This paper is part of the joint project between the Directorate General for Migration and Home Affairs of the European Commission and the OECD's Directorate for Employment, Labour and Social Affairs on "Review of Labour Migration Policy in Europe".

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Grant: HOME/2013/EIFX/CA/002 / 30-CE-0615920/00-38 (D1130895)

A previous version of this paper (DELSA/ELSA/MI(2015)4) was presented and discussed at the OECD Working Party on Migration in June 2015.

Authorised for publication by Stefano Scarpetta, Director, Directorate for Employment, Labour and Social Affairs, OECD.

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ABSTRACT

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Grant: HOME/2013/EIFX/CA/002 / 30-CE-0615920/00-38 (DI130895)

A previous version of this paper (DELSA/ELSA/MI(2015)4) was presented and discussed at the OECD Working Party on Migration in June 2015.

The paper assesses the impact of three European Directives – Student Directive, Researcher Directive and the Blue Card Directive – on migration flows from third countries to the EU. Using a difference-in-difference empirical strategy and data from the EU-LFS and Eurostat database on work permits to non-EU workers, it estimates the effect of each Directive on the inflow of targeted third country nationals. Overall, the econometric analysis does not provide evidence of a direct impact of the implementation of either of the Directives on the inflow of targeted groups. Most member states did experience an increase in the inflow of non-EU high skilled workers after the adoption of the Blue Card Directive; however, this increase can be almost entirely explained by positive pre-existing trends in the inflow of this type of immigrants. Similarly, despite the increase in the number of permits issued to students and researchers from third countries in Europe, difference-in-differences estimates do not provide evidence of a direct effect of the implementation of the Student and Researcher Directive on changes in this type of inflows. The absence of a measurable impact of the three Directives analysed may be due to delayed effects of policy changes, which take time to filter into perception and thus affect immigrant inflows to Europe.

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THE IMPACT OF THE IMPLEMENTATION OF COUNCIL DIRECTIVES ON LABOUR MIGRATION FLOWS FROM THIRD COUNTRIES TO EU COUNTRIES

Introduction

1. This paper evaluates the impact of European Union's migration policies on the magnitude and composition of labour migration flows of third country nationals into EU Member States. The target of the policies analysed is to reduce obstacles to entry in the EU of three categories of third country nationals (i.e. students, researchers, and highly skilled workers), and to level their work conditions relative to EU citizens.

2. Several studies have documented Europe's need for high-skilled workers (Bauer and Kunze 2004; Chaloff and Lemaitre 2009; Kahanech and Zimmermann 2011): labour market shortages, ageing of the population, and heavier welfare system's burden increase the demand for skilled migration. High-skilled migrants positively contribute to the economic growth of receiving economies by spurring innovation, widening the tax base, and raising wages of low-skilled workers because of complementarities in the production process (Aydemir 2014).

3. Immigration management and the design of effective policies aiming at attracting high-skilled foreign workers has become one of the key challenges for the European Union. The lack of co-ordination among Member States, and the widespread belief among the general public of immigration as a threat instead of opportunity, have limited the efforts of the European Union to adopt a common immigration policy. Over the years Europe has been facing the issue of labour skill shortages through two approaches: free mobility of labour across Member States and inflows from non-EU countries (Zimmermann 2005). EU enlargement to new Member States has increased the immigration potential and mitigated skill shortages (Kahanech, Zaiceva and Zimmermann 2010). On the other hand, some of the EU-level immigration policies targeting third country nationals have been implemented only recently through Council Directives, their effects are thus difficult to evaluate. Since final decision on admissions has always been in hands of national governments, national-specific regulations and quotas appear more influential than European policies.

4. This paper precisely addresses this issue by assessing whether EU Directives have helped to foster EU attractiveness as a destination for third country nationals. In particular, I focus on the Blue Card Directive (2009/50/EC), the Researcher Directive (2005/71/EC), and the Student Directive (2004/114/EC). For this empirical investigation I use data from the European Union Labour Force Survey (EU-LFS), a rotating random sample survey covering the population in private households in European countries, and Eurostat database on the number of first permits issued to non-EU migrants for study and work reasons.

5. The Blue Card Directive, which aimed at easing the access of highly skilled non-EU workers to Europe, came into force in 2012. Highly skilled are tertiary educated individuals earning above a national salary threshold, which should be set at least at 1.5 times the average gross salary in the host country. Descriptive evidence shows that, as of 2013, national schemes are still the most used tool to attract high-skilled migrants; for instance, more than 9,000 high-qualified non-EU workers entered the Netherlands in 2013, only three of them were granted a Blue Card. Other Member States, such as Germany and

Luxembourg replaced their national scheme with the EU Blue Card system; however the magnitude of these flows is almost negligible when compared to the stock of non-EU high-skilled workers already employed in Europe. The econometric analysis shows that the Directive has not had any statistically significant impact on the inflows of high-skilled third country nationals to countries that adopted it. Only France experienced an improvement in the composition of migration flows after the implementation of the Directive: the number of high-skilled migrants increased more than the number of other types of immigrants; this effect, though, cannot be entirely attributed to the Directive as the inflows of high-skilled immigrants to France have increased since 2008.

6. The Researcher Directive was adopted in 2005 with the intention to facilitate the entry of third country nationals who migrate for the purpose of carrying out scientific research. Existing studies have provided evidence of an increase in the number of permits granted for research related reasons, interpreting it as the direct effect of the Directive (ICMPD 2011). Using EU-LFS data on newly arrived international researchers to Europe and a difference-in-differences econometric strategy, I do not recover any evidence of an increase in the inflow of third country national researchers to Member states following the Directive's transposition.

7. The last Directive analysed in this paper, i.e. the Student Directive, sets the rules for entry and stay of international students to the EU. The aim of this Directive was to advance the EU as a centre of excellence in education, thus increasing the inflow of third country national students. Students are central to EU as they represent a potential source of high-level skills to meet labour market needs. Since 2008, the number of first permits issued for all education reasons has increased almost everywhere in Europe. However, this increase can be largely explained by time trends or country-specific factors, such as the quality of the educational system, rather than by the Directive's adoption.

8. Overall the empirical analysis shows that the three EU Directives analysed in this paper have not been fully successful in attracting the targeted categories of immigrants. Among different reasons behind this no measurable impact, one has to do with delayed effects of policy changes. It may be too early to observe any impact of these Directives on immigrant inflows; Member States need time to correctly transpose EU measures into their national legislation. Moreover, possible flaws and low level of coherence in the Directives' implementation across Member States could also postpone these policies' effects. Finally, employers and potential migrants must be provided with sufficient information about the procedures to obtain these permits; this takes time and may then delay any observable impact on flows.

9. The remainder of this paper is organised as follows. Section 2 provides a literature review of studies of the impact of immigration policies on immigration flows. Section 3 focuses on the implementation of the Blue Card Directive on the inflows of non-EU high-skilled workers. Section 4 analyses the effect of the Researchers Directive on the mobility of third country national scientists. The evolution of international students' migration to the EU and the effect of the Student Directive are investigated in Section 5. Section 6 concludes the paper.

Literature Review

10. Numerous studies have highlighted the importance of economic factors as determinants of international migration. Income differentials, physical distance and migration costs largely explain differences in the magnitude and the composition of migration flows across countries and over time (Borjas 1987, 1999; Grogger and Hanson 2008).

11. The role of destination countries' immigration policies in attracting foreign-born workers has

received relatively little attention in the migration literature;¹ much of the existing studies have focused on the effect of immigration policies on the volume of arrivals. Ortega and Peri (2009) collected data on annual bilateral migration flows for 15 OECD receiving countries and 120 source countries, as well as information on immigration policy's changes at the destination over the period 1980-2006. They show that restricting laws regulating immigrants' entry causes inflows to fall by about six percent after one year. Differences in per capita income are still the key driver of migration, a one percent increase in income per capita at the destination increases immigration flows by 0.76%; however, the same elasticity almost doubles when mobility flows (i.e. intra-EU migration) are considered, implying that *pull factors*, e.g. per capita income, become more important in affecting migration decision when the degree of mobility increases. They finally estimate a strong positive effect of the Maastricht Treaty on internal migration, i.e. an increase by about 10% in total flows; while they find that the Schengen Agreement reduced outside-EU immigrants' arrivals. This last result is consistent with findings by Beine et al. (2011): the Schengen Agreement had a weak effect on total flows but it seems to have contributed to the increase in the share of highly skilled foreign-born workers.²

12. Along similar lines, Mayda (2010) constructed a migration policy index for 14 OECD countries that identify whether regulations become more or less restrictive over the time. She finds that pull factors, such as income at a given destination, increase migration rates; on the other hand, push factors, i.e. per capita GDP at the origin, have negative but insignificant effect on migration decisions. The effect of both pull and push factors significantly increases in magnitude and statistical significance when these factors are interacted with changes in immigration policies. Distance and sending country's per worker GDP have a pronounced impact on migration decisions' when the immigration legislation at a given destination becomes less restrictive. Moreover, when governments loosen immigration laws, economic forces play a predominant role in attracting foreign-born workers.

13. By looking at specific immigration policies, Karemera et al. (2000) studies the determinants of migration to Canada and the USA. In particular, they look at changes in the US immigration policy that occurred in 1976, 1980 and 1986, and at the reforms in the Canadian Immigration Act which were implemented in 1976 and 1978. They find that these reforms had a substantial effect on the size and composition of migrant flows: tightening migration regulations has led to a reduction in annual migration. Similarly, Clark et al. (2007) considered changes in quotas for the USA over 1971-1998 as a measure of policy restrictiveness. Through counter-factual simulations, they assess that the impact of loosening immigration laws, such as the 1990 Immigration Act,³ raised immigrants' arrivals by 8% over 1992-1994.

14. Focusing on the UK, Hatton (2005) investigates the role of EU and UK immigration restrictions in shaping immigration flows. Despite the high explanatory power of variables such as income and unemployment, policies do have a significant effect on migration. For instance, EU enlargements of 1986 (Portugal and Spain) and 1995 (Austria, Finland, and Sweden) raised immigration of European citizens to the UK. Similarly, the loosening of UK immigration policy in 1998 and 2000 is associated with an increase of about 59,000 immigrants per year.

15. Another strand of the literature investigated the role institutions as determinants of international

1. For an extensive review of this literature see Czaika and de Haas (2011).

2. The Maastricht Treaty was signed in 1992 leading to the creation of the Euro; it also restated the principle of an internal market, lifting restrictions on migration flows from Spain and Portugal to other EU countries. The Schengen Agreement created the borderless Schengen territory in 1985 in Europe and entered into force ten years later; it facilitated intra-EU mobility of citizens of signatory States and it strengthened boarder control to enter the Schengen Area.

3. This act increased the number of visas of about one third between 1991 and 1992.

mobility from an historical perspective. Bertocchi and Strozzi (2010) find that the level of democracy and the quality of political institutions are magnets to international migration. These authors also provide evidence that *migration institutions*, such as unrestrictive citizenship laws, contribute to explain cross-country variation in 19th century mass migration: countries with better institutions are associated with higher immigration rates.

16. Falling barriers to migration are generally associated with larger volumes of migration flows. Only few studies have instead focused on the effect of immigration policies on the composition of immigrant flows, i.e. whether they managed to attract low or high skilled migrants; these papers mainly look at the effect of the implementation of point-based systems on the selectivity of immigrants.

Green and Green (1995) investigate whether the implementation of the Canadian point system in 1967 had an impact on the occupational composition of immigration to Canada. They find that the new system shifted the inflow away from unskilled labour, such as transportation workers, towards professionals. These compositional effects are only recovered immediately after the implementation of the point based system, and they fade out over time.

EU Blue Card Directive (2009/50/EC)

17. In 2007 the European Commission proposed an EU residence and work permit, i.e. the Blue Card, to facilitate the entry of high-skilled non-EU nationals. The aim was to compete with Canada, Australia and the United States in attracting *talents*. The Directive 2009/50/EC was eventually adopted on 25 May 2009. Member States had to transpose the Directive into national law within a period of two years, i.e. 19 June 2011; Denmark, Ireland, and the United Kingdom opted out.

18. Requirements to obtain a Blue Card are: a valid work contract or a binding offer for a skilled job, and a minimum salary threshold equal to at least 150 percent of the annual average wage in the destination country. Some countries allowed a possible derogation to 1.2 times the gross annual average wage for workers employed in professions in which there is a high demand for migrant workers. The period of validity ranges from one to four years, the Blue Card is generally issued for the duration of the work contract plus three additional months. This permit can be renewed without limitations as long as the requirements mentioned above still hold. Holders of the Blue Card, are entitled to social and welfare rights, freedom of movement within the Schengen area, and family reunification.

19. In July 2011, the Commission launched infringement procedures against eighteen Member States that did not transpose the Directive in time.⁴ By early 2013 all Member States but Sweden and Lithuania were able to issue Blue Cards. Signatory States still reserve the right to limit the entry of this type of immigrants through quotas fixed by national governments. Moreover, national schemes aiming at attracting talents may still be in place and thus competing with the Blue Card system.

Descriptive Evidence

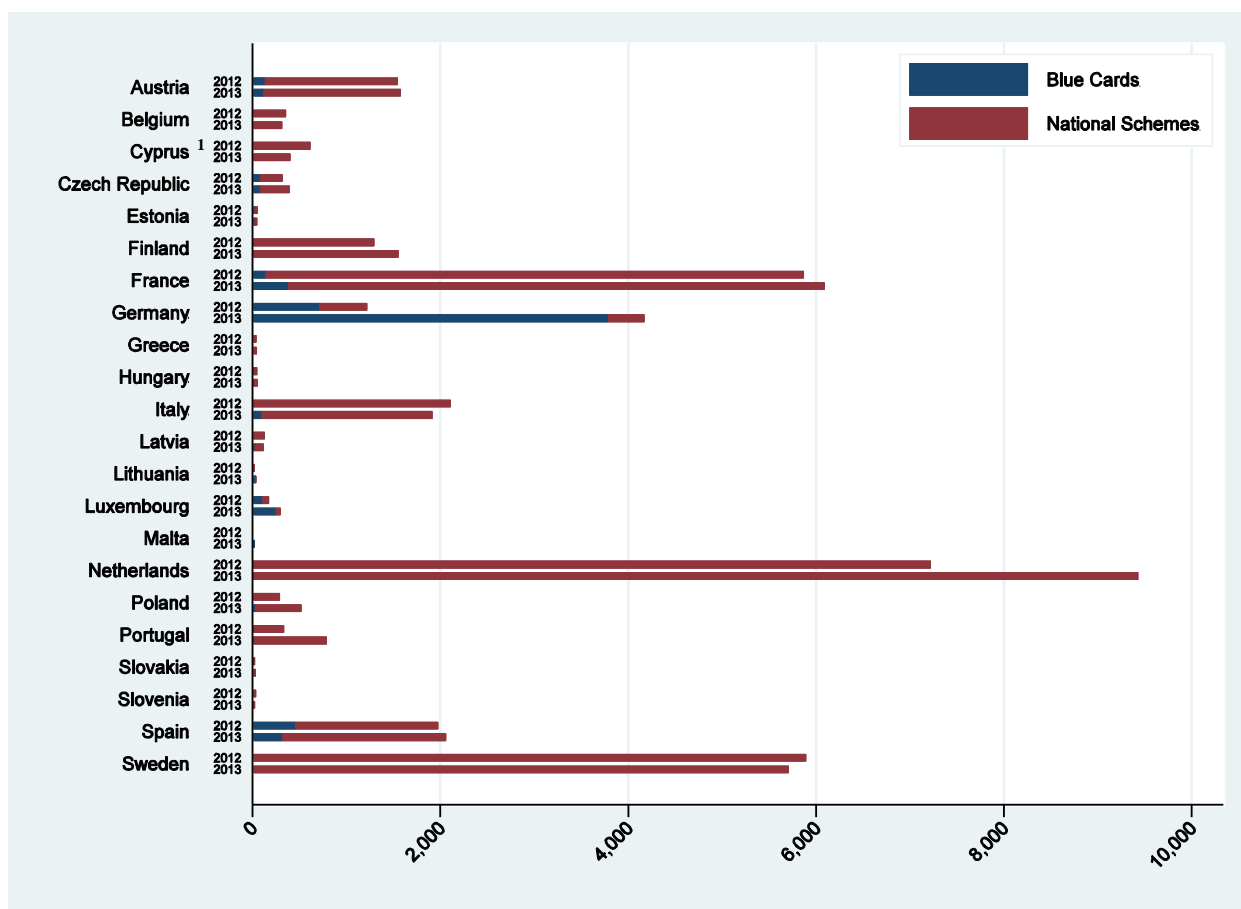
20. Figure 1 uses data from Eurostat database on first work permits issued in 2012 and 2013 to non-EU citizens to show the use of Blue cards by Member States compared to work permits issued under national schemes.⁵ All EU-25 countries are included in the graph; Denmark, Ireland and the United

4. These Member States are: Austria, Belgium, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, Portugal, Slovakia, Slovenia and Sweden.

5. The appendix provides a detailed description of the data used in this work. Data on work permits refer to first permits issued for remunerated activities (*migr_resocc*), distinguishing between researchers, high-skilled workers and Blue Cards (since 2012). As these permits are issued to newly arrived immigrants, Blue Cards granted to foreign-workers that were already living in the host Member State previously

Kingdom are not represented as they decided not to adopt the Directive, while Lithuania and Sweden only transposed it in 2013. The Figure clearly indicates that national schemes are still the most used tool to regulate the entry of high-skilled immigrants. Among Member States, only Germany and Luxembourg almost entirely replaced their national entry schemes with the Blue Card system by 2013; in these countries the number of Blue Cards over other types of work permits was close to one. The same proportion in France and Italy, two of the largest immigration countries in Europe, was only six and four percent respectively. According to this figure, the Netherlands is the country that attracted the largest number of highly skilled immigrants in the two years considered, but only four of them entered the country holding a Blue Card.

Figure 1. First permits to high-skilled immigrants by type



Notes: Data come from Eurostat and they refer to first residence permits issued for remunerated reasons to highly skilled immigrants (*migr_resocc*). In 2012 and 2013 Eurostat also provides data on the number of Blue Cards issued by every Member State, these are Blue Cards granted to newly arrived immigrants only.

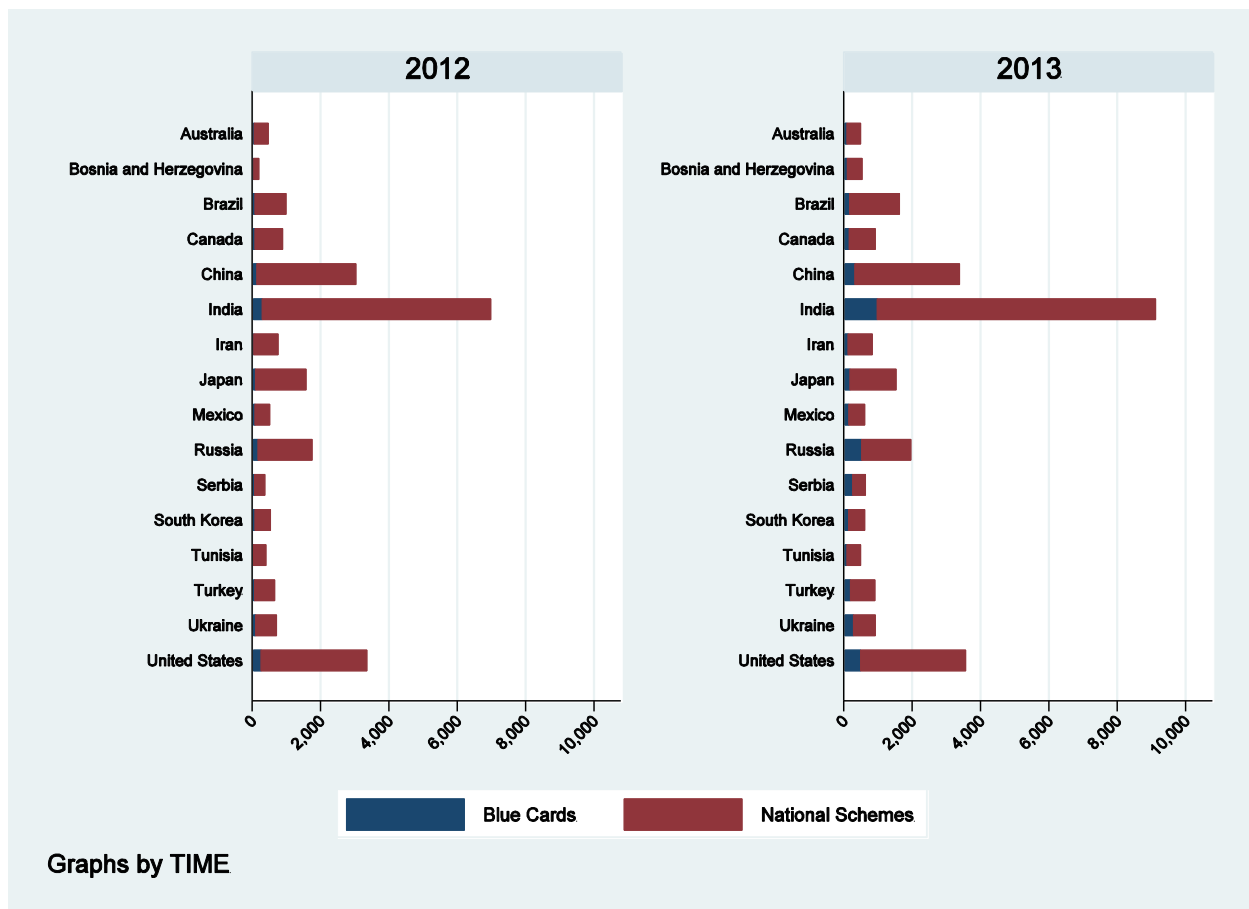
1. Footnote by Turkey: The information in this document with reference to « Cyprus » relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of United Nations, Turkey shall preserve its position concerning the “Cyprus issue”.

Footnote by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.”

holding a different work permit, are not reported. It should be noted that some immigrants may be granted a general work permit, even if they meet all requirements for a high-skilled permit.

21. If we look at the main countries of origin in both 2012 and 2013 (Figure 2), Indians represent the largest group of high-skilled immigrants, followed by US and Chinese nationals. In 2012 only immigrants from few countries were granted Blue Cards, namely India and the US. After a year, the proportion of Blue Cards increased for almost every sending country analysed.⁶ Top sending countries are middle income economies, such as China (upper middle), India (lower middle), as well as high income economies, like Russia, the United States and Japan.⁷ The figure suggests that the Blue Card Directive does not target immigrants from specific countries, the proportion of Blue Cards is homogeneous across top sending countries. The probability of getting a Blue Card is likely to depend on the immigrant's destination rather than the country of origin: among immigrants arriving from India only 10% were granted a Blue Card in 2013, of which about 90% were issued by Germany.

Figure 2. First permits to high-skilled immigrants: top origin countries



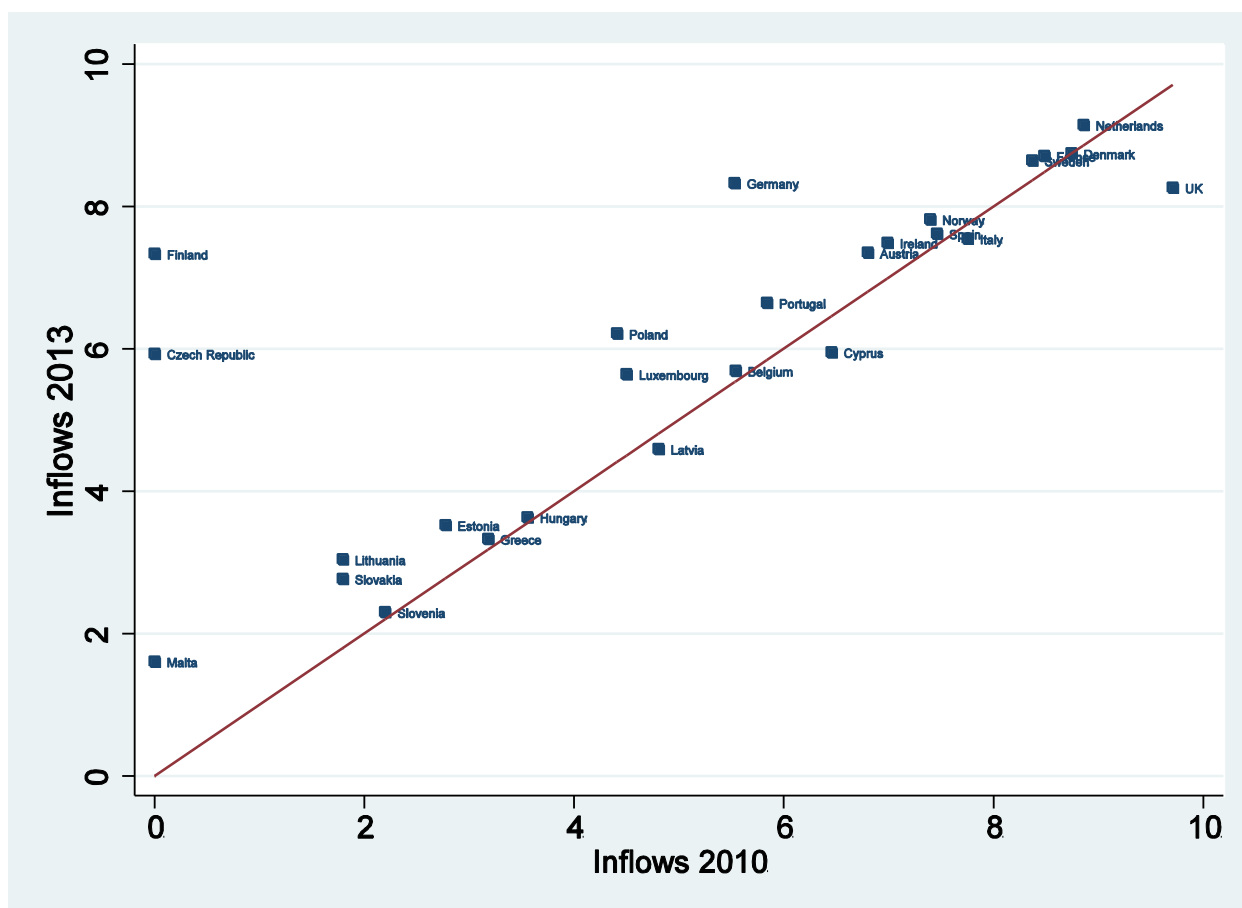
Notes: Only origin countries that contributed to the 90% of arrivals are reported. Destination countries are the ones represented in Figure 1. The number of permits to third country high-skilled immigrants includes both Blue Cards and national permits and come from Eurostat (migr_resocc).

6. Only top sending countries, according to the number of arrivals in 2013, are reported.

7. According to the World Bank classification, lower middle income countries have GNI per capita between US\$1,026 and US\$4,036; while upper middle income countries have GNI per capita between US\$4,036 and US\$12,476

22. Figure 3 plots the number of high-skilled immigrants arrived in 2010 and 2013 for all Member States, including those that were not subject to the Directive, and Norway. Among countries that adopted the Directive, Italy experienced a decrease in the number of permits issued to highly skilled (i.e. squares below the 45-degree line). Large and positive changes are registered in Germany, Finland and the Czech Republic.

Figure 3. Changes in the number of first permits to high-skilled immigrants, 2010-2013



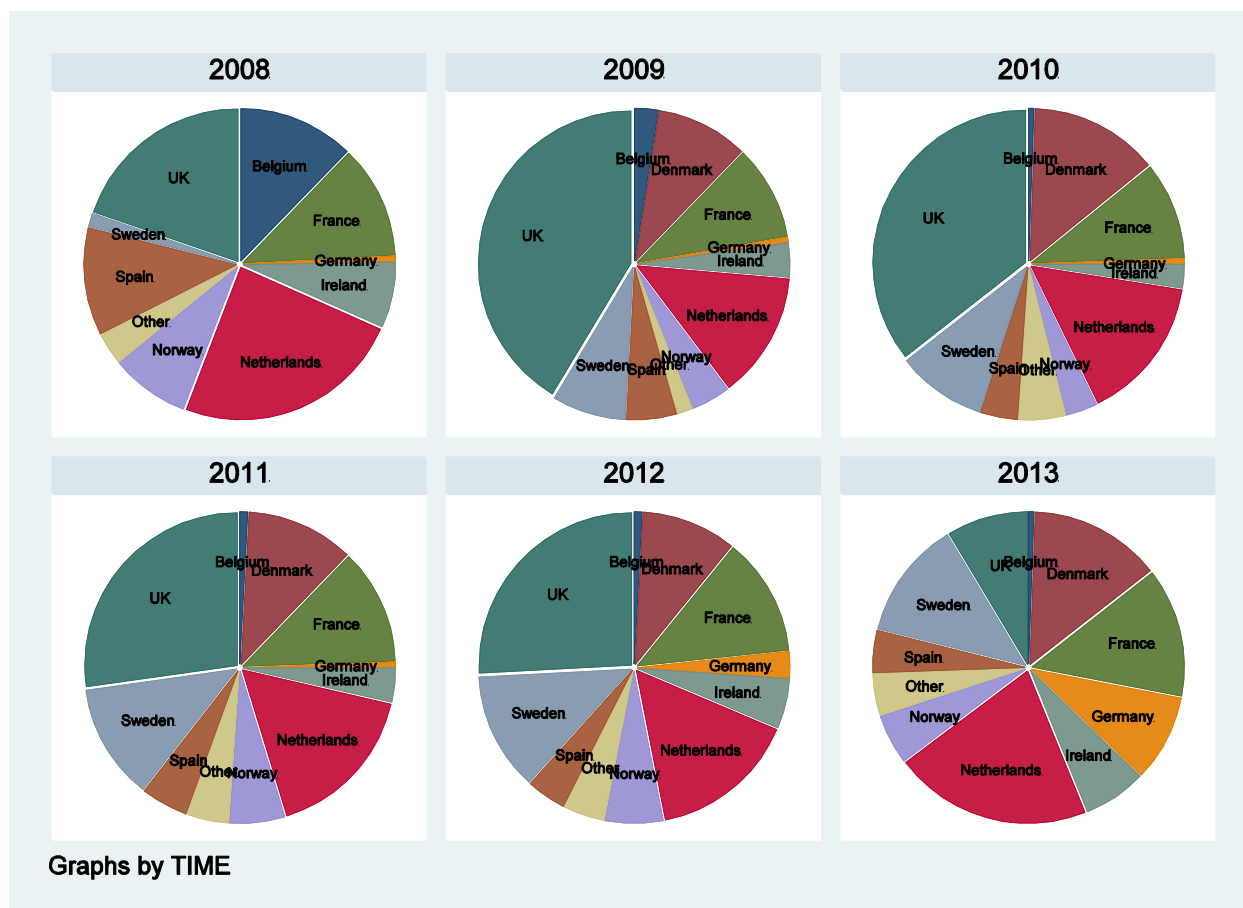
Notes: Data come from Eurostat (*migr_resocc*) and they refer to the number of permits to third country high-skilled immigrants. On the vertical axis the number of first permits (in log) issued to high-skilled in 2013 is reported. The same number (in log) for 2010 lies on the horizontal axis.

23. Figure 4 reports the *market share* of each Member State, i.e. the number of newly arrived high-skilled immigrants in each European destination over the total number of newly arrived high-skilled in Europe. Only top ten European destinations are considered.⁸ In 2009 the United Kingdom was the main receiving country for highly qualified immigrants, almost pulling half of the total flows to Europe. In between 2011 and 2013 the number of highly skilled migrants entering the UK had decreased by more than a third, the reason being the government's intention to reduce net migration; since the British government could not stop the inflow of European workers following EU enlargements, they had to limit the inflow of

8. The figure uses data from Eurostat database on first permits issued for remunerated activities to high-skilled non-EU workers and Blue Cards (since 2012). Each country's share is computed as the number of first permits issued over the total number of first permits issued in Europe every year.

non-European migrants. In 2013 both Netherlands and Germany experienced an increase in the share of high-skilled immigrants, possibly attracting some of the flows that used to be directed to the United Kingdom. This increase seems to be attributable to the adoption of the Directive. If this may be plausible for Germany, it is hard to believe that the Directive had an effect also for the Netherlands as it only issued four Blue Cards in 2012 and 2013.⁹ Overall Figure 4 suggests that since 2009 a larger number of Member States become more competitive in attracting talents, implying that the level of competition for high-skilled in Europe has constantly raised.

Figure 4. Shares of high-skilled immigrants: top receiving countries



Notes: Only top ten destinations are reported. All other European States are classified as "Other". The figure plots the share of highly skilled third country nationals relative to the total amount of high-skilled arrivals every year in Europe. Data used come from Eurostat and they refer to new permits issued to high-skilled non-EU immigrants.

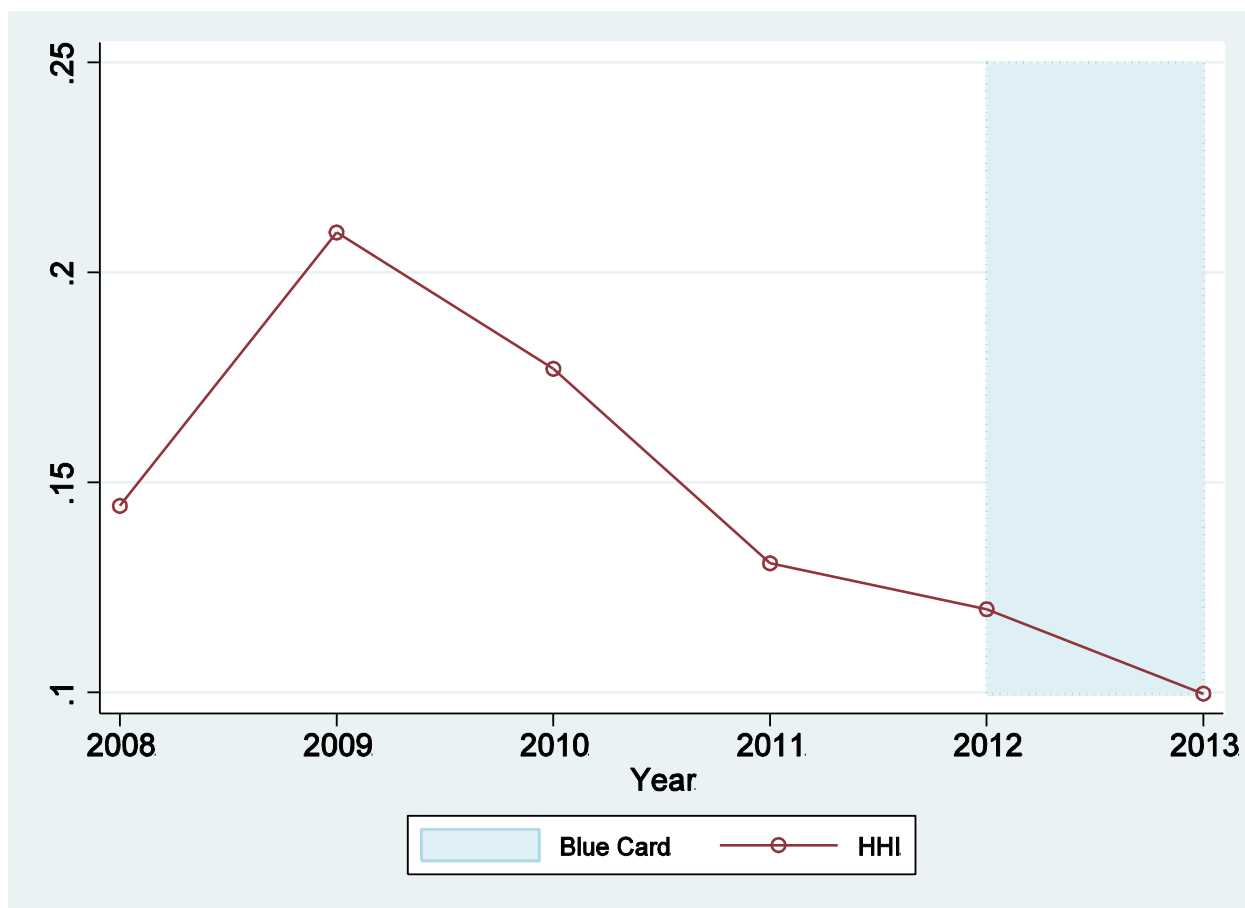
To support this claim, Figure 5 plots the evolution of the Herfindahl index over time in Europe, which has been on a declining path since 2009.¹⁰ Whether the Directive had any effect in increasing the inflow of highly qualified workers from non-EU countries to Member States, and thus improving their

9. The figure uses data from Eurostat database on first permits issued for remunerated activities to high-skilled non-EU workers and Blue Cards (since 2012). Each country's share is computed as the number of first permits issued over the total number of first permits issued in Europe every year.

10. The Herfindahl index is computed as $HHI = \sum_{i=1}^N s_i^2$ where s_i is the share of immigrants entering country i . The index ranges from $1/N$ to 1, values above 0.25 generally indicate high concentration and low competition.

competitiveness, remains an open question.

Figure 5. Herfindhal index and high-skilled migration



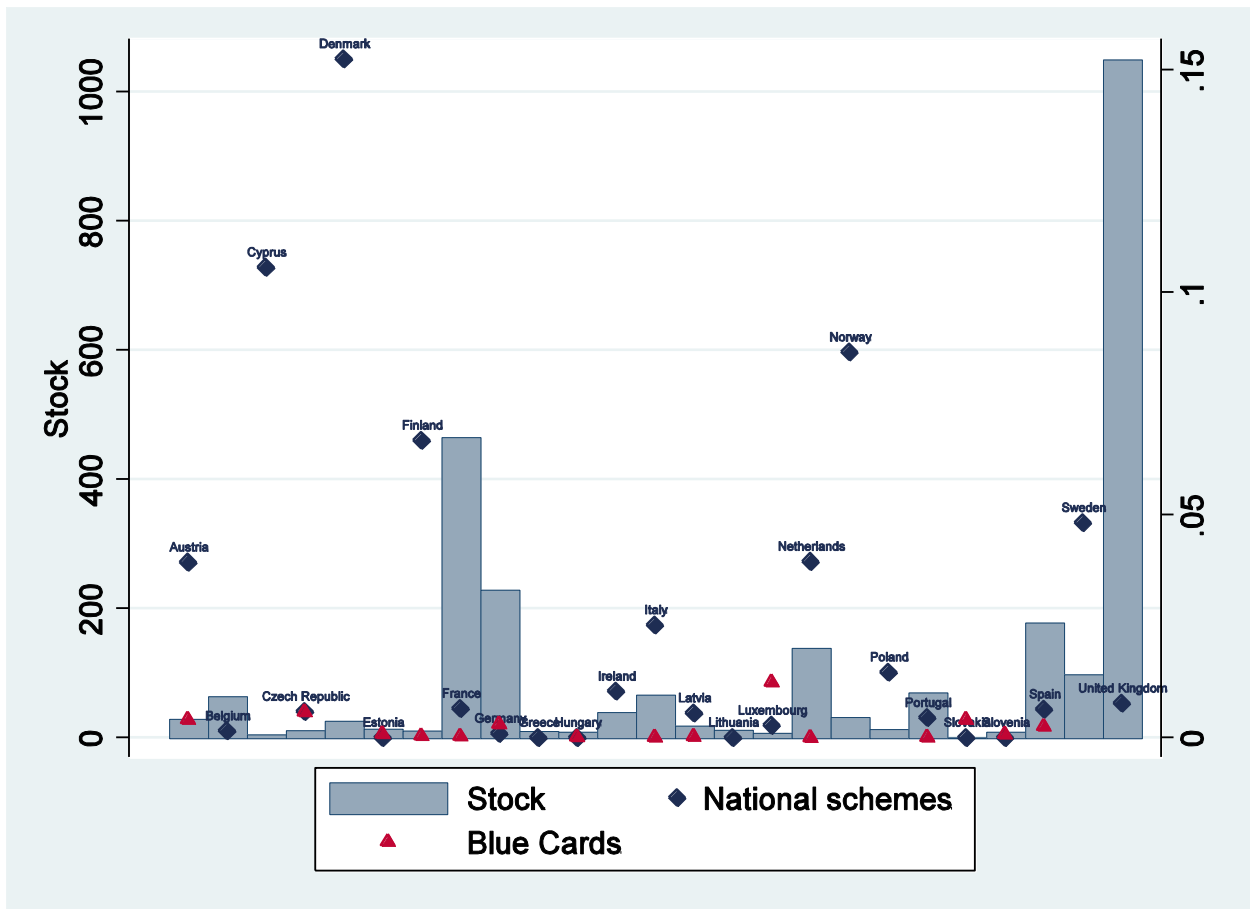
Notes: The Herfindahl index is computed as $HHI = \sum_{i=1}^N s_i^2$ where s_i is the share of non-EU high-skilled immigrants entering country i . Data are the ones used in Figure 4.

24. Before turning to the econometric analysis of the Blue Card Directive's impact, it is worth looking at the magnitude of immigrants' flows compared to the population of high-skilled third country nationals already living in Europe.¹¹

25. Figure 6 puts the number of first permits issued in each European country (both Blue Cards and national schemes) into context. Vertical bars report the stock of high-skilled non-EU immigrants in 2012, on the left hand-side vertical axis; while the shares of Blue Cards and national permits are represented by red and blue dots respectively, on the right hand-side vertical axis.

11. Using the EU-LFS, I define this group of immigrants as all tertiary educated non-EU workers (employed in a skilled job), who meet the salary threshold and have lived in the host country for 2 to 10 years. Information on the monthly (take-home) pay from main job is available in the EU-LFS data, but this variable only tells the corresponding decile of the wage distribution. I therefore retain workers in top four deciles, i.e. 7th – 10th decile. Skilled jobs are defined according to the ISCO-88 classification of occupations (at one digit level); these occupations are "Legislators, senior officials and managers" (ISCO-88=1), "Professionals" (ISCO-88=2) and "Technicians and associate professionals" (ISCO-88=3).

Figure 6. Inflows and stock of high-skilled third country nationals in Europe, 2012



Notes: The figure reports the ratio of newly arrived high-skilled immigrants from non-EU countries to the stock of high-skilled non-EU immigrants already living in each host country in 2012. The proportion of immigrants entering under the Blue Card system is represented by red triangles on the right hand-side Y-axis. The ratio of immigrants granted a national permit other than the Blue card is given by blue diamonds. Vertical bars represent the number (on the left hand-side Y-axis, in thousands) of non-EU high-skilled foreign workers. Eurostat provides number of first permits issued to high-skilled workers, including Blue cards and national work permits to high-skilled. To estimate the stock of high-skilled immigrants I used the European Labour Force Survey.

26. It seems that the group of third country nationals targeted by the Directive is much larger than the actual number of permit holders in each Member State. For instance, in Germany, where national entry schemes were almost entirely replaced by the Blue Card system, the share of Blue Card holders relative to the stock of high-skilled immigrants from outside the EU was less than .01. A similar figure is recovered for Luxembourg, where the Blue Card is the main entry scheme for non-EU high-skilled nationals. As a comparison, the proportion of national permits relative to the stock of high-skilled immigrants in Denmark is about 15%. Denmark introduced a green-card scheme based in 2007, allowing foreigners with particular educational qualifications, job experiences and language skills to live in Denmark for three years while they look for work.¹² If we consider the Netherlands, the share of Blue Cards relative to the stock of non-EU high-skilled immigrants was very close to zero in 2012, as only one Blue Card was issued in that year; on the other hand, the proportion of new permits issued under national scheme relative to the same target group was considerably higher, being roughly equal to 4%.

12. According to Eurostat, the number of Green cards issued to high-skilled third nationals entering Denmark in 2012 was 4,088.

27. At first glance, this figure suggests that, as of 2012, national schemes were more effective than the Blue Card system in targeting high-skilled immigrants. This figure also suggests that countries that were able to attract a large number of high-skilled immigrants appeared to be reluctant in transposing the Blue Card system.

Empirical Analysis

28. From the descriptive evidence just presented, it is unclear whether the patterns that we have observed are due to the implementation of the Blue Card Directive.

29. In this section I show regression results from a difference-in-differences (DiD) model, which estimates the effect of this Directive on inflows of high-skilled immigrants to Europe. The DiD strategy compares the average change over time in the outcome variable (i.e. immigrant inflows) for the treatment group (i.e. migrants targeted by the Directive) to the average change over time for the control group, composed of non-targeted migrants.

30. This econometric strategy assumes that no major events, which can potentially affect the inflow of migrant workers, happened at the same time of the implementation of the Directive. In other words, the key assumption of the model is that differences between treatment and control groups would have remained constant in absence of the Directive's implementation. One has to exercise some caution in interpreting Difference-in-differences results as causal: this strategy relies on the use of arbitrary counterfactual groups thus not eliminating all potential sources of bias.

31. For this empirical exercise I use data on first permits issued for remunerated reasons to high-skilled migrants from outside the EU. The data cover the period 2008-2013 and they provide information on flows to 25 Member States (and Norway) from 164 sending country.¹³ The data also distinguish between third country national workers by type of permit; the main categories are: students, researchers, high-skilled workers, workers (other than high-skilled), and family members. I thus compare total inflows of highly skilled immigrants to the ones of all not-high skilled immigrants entering the country for work reasons.¹⁴

32. The estimated equation is:

$$y_{ijt} = \beta_0 + \beta_1 After_t + \beta_2 Directive_i + \beta_3 Directive_i * After_t + \eta_{ij} + \theta_{jt} + \phi_{it} + u_{ijt}(1)$$

where y_{ijt} is the number (in logs) of immigrants to country i at time t from origin j . All origin countries are non-European States. *After* is a dummy variable for years 2012 and 2013, i.e. after the official transposition date. Like in a classical *intention-to-treat study*, all countries have been assigned the same transposition date, regardless of whether or not they transposed it in time; this strategy mitigates potential endogeneity in the timing of the Directive's implementation across countries.

33. *Directive* is the treatment variable, which takes value one for immigrants classified as high-skilled and value zero for immigrants entering the country holding a standard work permit. The control group is thus composed of all third country national workers entering Member States other than the highly skilled.¹⁵ This category of foreign-born workers is not targeted by the directive and thus not affected by it;

13. Switzerland, Bulgaria, Romania and Croatia are excluded from destination countries as data on permits are available only for two years, 2012 and 2013.

14. Family members, students and researchers are excluded from the analysis.

15. From now on this type of immigrants are named not-high skilled (see the Appendix).

the key assumption is that there are no spillover effects of the adoption of the Blue Card system: the treatment group received the treatment and the control group did not. The coefficient of interest is thus β_3 , which estimates the average treatment effect of adopting the Blue Card system on the inflow of high-skilled migrants.

34. The advantage of this econometric specification is that it allows controlling for time and country specific unobservables simultaneously affecting both high and not-high skilled migration flows. η_{ij} are origin-destination country fixed effects, capturing unobserved time-invariant differences in flows from country j to country i , such as bilateral agreements between single EU Member States and specific sending countries. θ_{jt} are origin-year fixed effects, which control for time-specific push factors in each origin country, such as wars or economic downturns. ϕ_{it} are year-destination fixed effects, washing out any spurious correlation due to unobservables that may have influenced all immigrants flows (high and not-high skilled) to a particular destination at a given time other than the implementation of the Directive, hence controlling for pull factors, as economic conditions at the destination or national migration policies. Finally, standard errors in all regressions are clustered at the level of the interaction between country of destination and year.

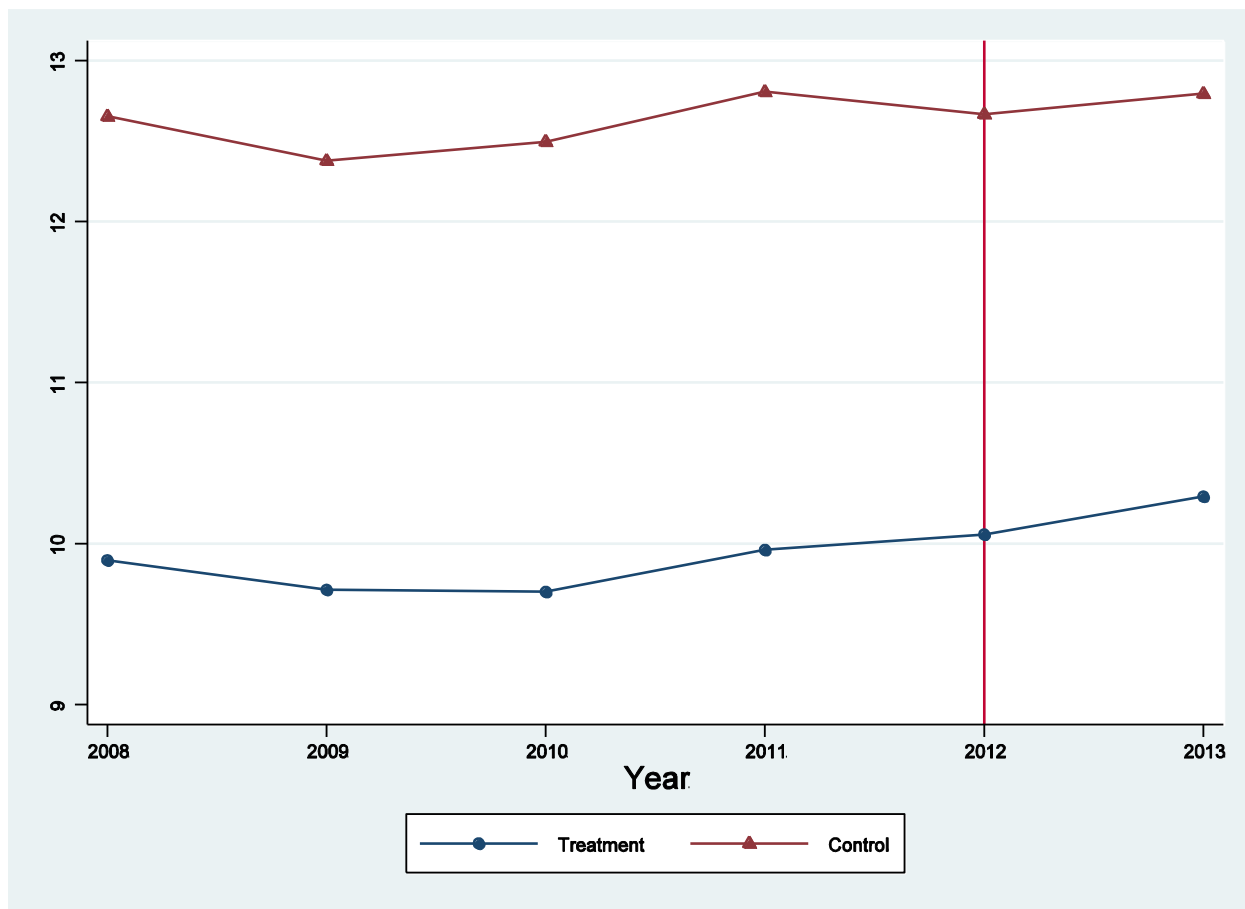
35. Results are shown in Table 1 (See Annex 2). The coefficient in column (1) is positive: the Blue Card's implementation increased the arrivals of high-skilled immigrants by 1.1 percent in the years after the implementation of the Directive. As the control is composed of all foreign workers other than high-skilled, a positive coefficient implies that the composition of inflows has changed and become more positively selected. However, the estimated coefficient is not statistically significant.

36. In order to look at the impact of the Directive in each Member State, I perform country by country regressions, which are reported in column (2). Only estimated coefficients for EU-15 countries are shown.¹⁶ Most of the coefficients are small and not statistical significance. Among European countries that adopted the Directive, the only one that had a positive and statistical significant increase in the number of high-skilled third country nationals is France. On the contrary, Luxembourg experienced a decline in the composition of immigrant flows in the years following the adoption of the directive.

37. The validity of this empirical specification relies on the common-trend assumption: underlying trends of the outcome variable must be the same for control and treated groups. Common trend assumption is difficult to verify but I use pre-treatment data, i.e. years before 2012, to visualise if treatment and control groups' trends are parallel before the transposition data. Figure 7 plots total inflows (measured in logs) of high-skilled and not-high-skilled immigrants over the period 2008-2013. The red vertical bar indicates the year in which the Blue Card system was implemented. Trends between treatment and control groups are similar before the implementation; however they do not start diverging after 2012, thus explaining why the coefficient in column (1) of Table 1 is not statistically significant. It also has to be noted that the number of highly skilled immigrants has constantly risen since 2010.

16. Sweden is not reported as it only transposed the Directive in late 2013. Denmark, Ireland and the United Kingdom are also excluded as they opted out. Coefficients for other Member States are never statistically significant and thus not reported.

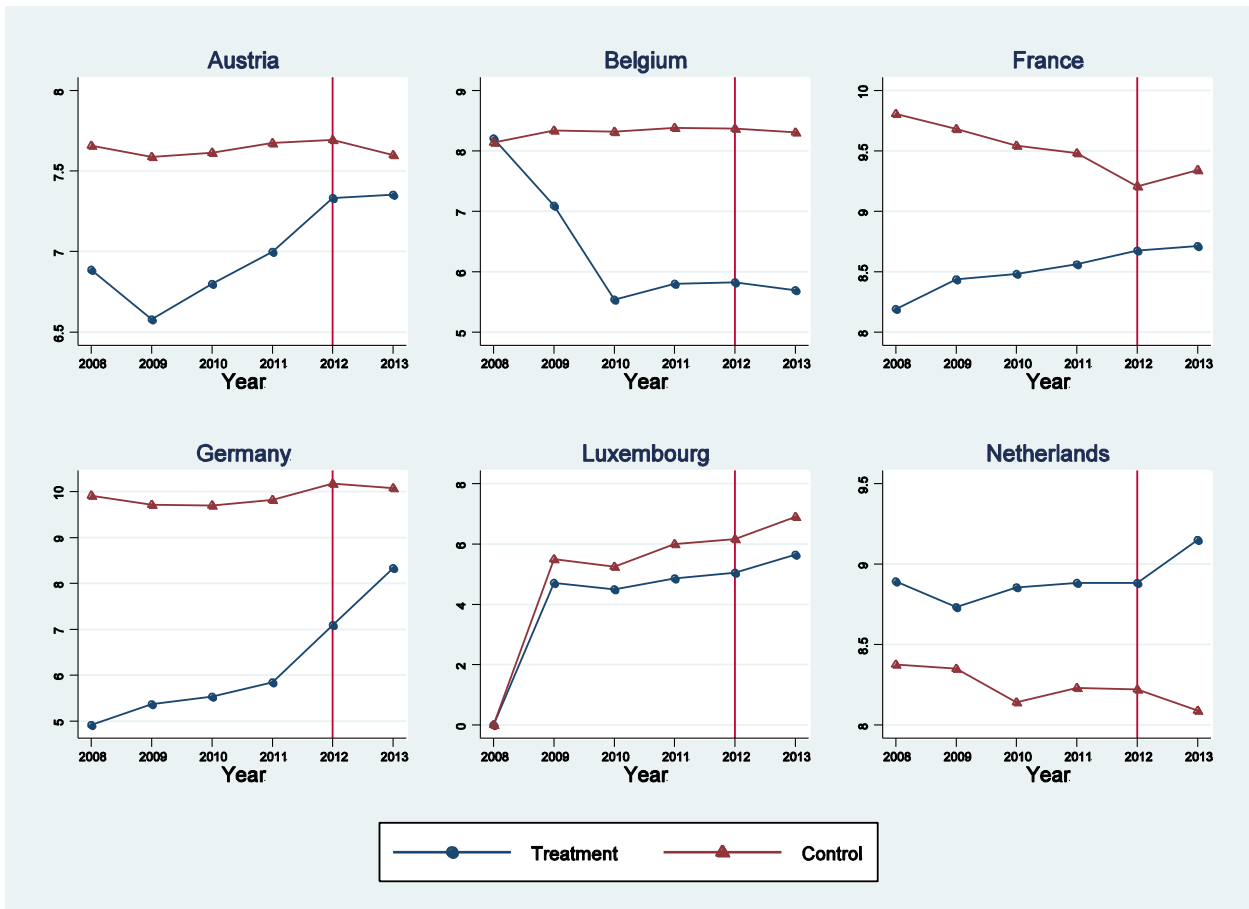
Figure 7. Inflows of high-skilled and not-high skilled immigrants



Notes: The figure reports the log number of permits issued to high-skilled (treatment) and not-high skilled (control) third country national workers entering Europe. Data are the same used in Figure 4.

38. Figure 8 plots the inflows of both high and not-high skilled for a sample of Member States. It is quite clear that trends between control and treatment group are different if we look at specific countries. For instance, France shows a decrease of not-highly skilled third country nationals before the implementation of the Directive; on the contrary, the inflow of highly skilled has been on an upward trend since 2008. The positive coefficient estimated for France in column (2) is likely to be driven by diverging trends between treatment and control groups rather than by the implementation of the Blue Card system. Similarly, the negative coefficient found for Luxembourg is probably due to the fact that the inflow of not-high skilled immigrants has constantly increased at a higher rate compared to the one of high-skilled well before the Directive’s adoption.

Figure 8. Inflows of high-skilled and not-high skilled immigrants, by Member States



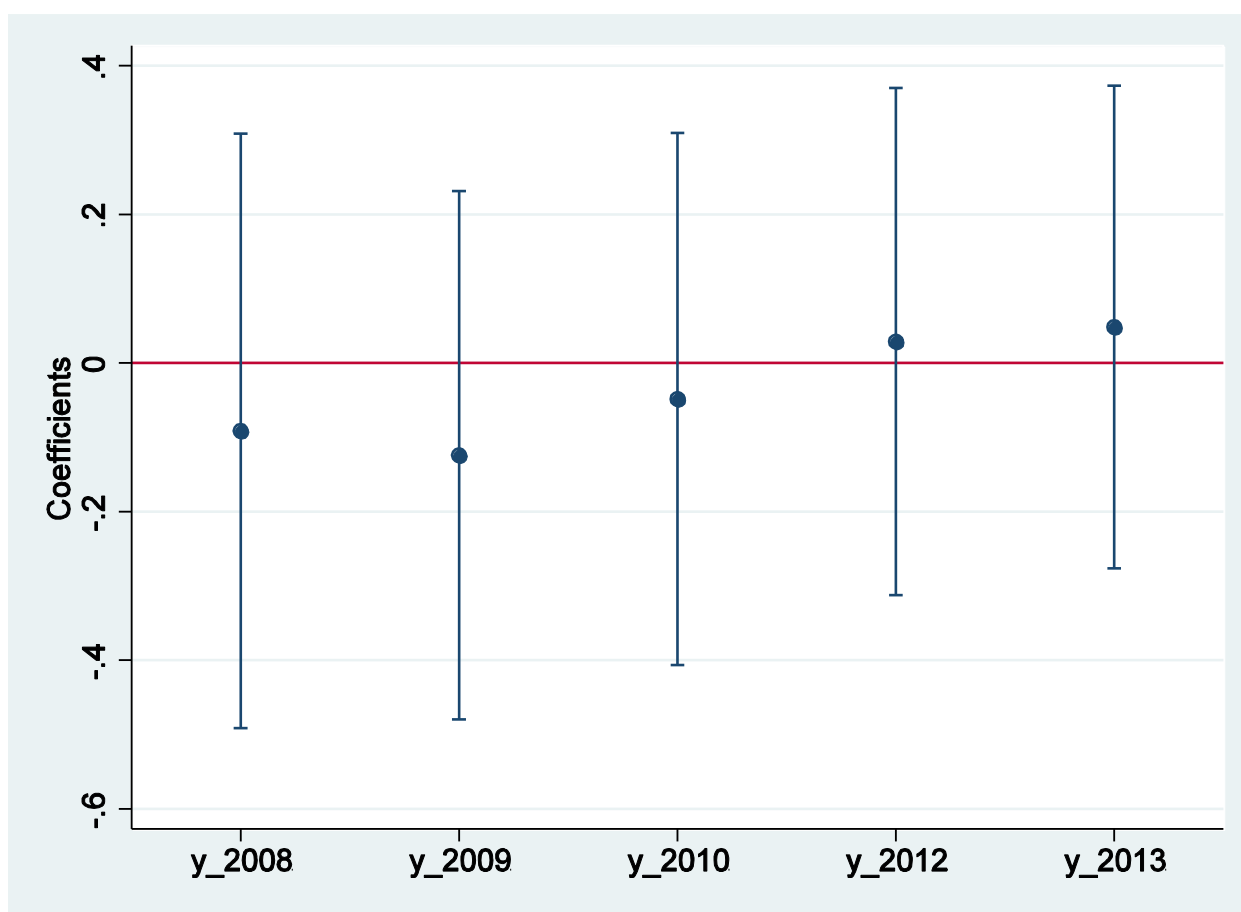
Notes: The figure reports the log number of permits issued to high-skilled (treatment) and not-high skilled (control) third country national workers entering Europe. Data are the same used in Figure 4.

39. The DiD implicitly assumes that the Directive had no impact on targeted migrants (i.e. highly skilled) in the pre-treatment periods, i.e. before 2012. Exploiting the time series feature of the data, I include in the regression lead and lag time dummies, capturing the effect of the Directive in each year before and after its implementation. This strategy allows me to test whether the treatment effect changes over time. I thus estimate the following equation:

$$y_{ijt} = \alpha_0 + \sum_{k=2008}^{2010} \delta_k \text{Directive}_{ik} + \sum_{k=20012}^{2013} \delta_k \text{Directive}_{ik} + \eta_{ij} + \theta_{jt} + \phi_{it} + u_{ijt}(2)$$

40. where $\sum_{k=2008}^{2010}$ captures anticipatory effects, i.e. effects of treatment in the pre-treatment years. While, $\sum_{k=2012}^{2013}$ are estimates for post treatment effects, indicating in which years after the implementation the Directive had an effect. The benchmark year is thus 2011. Coefficients are reported in Figure 9. The figure plots the magnitude of the estimated coefficients (dots) and their statistical significance measured by 95% confidence intervals (vertical bars). The outcome variable is again the log number of immigrants arriving in Europe. The pre-treatment dummies are never statistically significant. This is good news for the common trend assumption to hold, as already shown in Figure 7. However post-treatment coefficients are not significant either, even if they turn from negative to positive in the years after the adoption of the Blue Card.

Figure 9. Pre and post treatment effect of the Blue Card Directive



Notes: The figure reports estimated coefficients of equation (2), where the dependent variable is the log number of non-EU immigrants arriving every year. Standard errors are robust. Vertical bars are 95% confidence intervals. 2011 is the reference year.

41. This result is consistent with the argument that it may be too early to see any effect of the Blue Card. It may take some more time to inform potential employers and potential migrants about all the necessary procedures to get the Blue Card and its condition of access.

Researcher Directive (Directive 2005/71/EC)

42. On 12 October 2005 the Council adopted the Directive 2005/71/EC, which regulates the entry of third country researchers for stays longer than three months. Doctoral students conducting research relating to their theses as students are not classified as researchers, their entry in a Member State is instead regulated by the Student Directive.

43. Any research institute willing to hire or host a researcher has to be first approved by the Member State in which it is located. Every year Member States must publish a list of approved research organisations.¹⁷ The organisation and the researcher must sign a hosting agreement, i.e. a legal contract, in which the researcher commits to the completion of the research project and the organisation hosts the researcher subject to the researcher being granted a residence permit. Moreover the organisation hosting a third country researcher, who resides unlawfully in the territory of the Member State, is financially responsible for six months after the end of the hosting agreement.

44. Research organisations may sign hosting agreements only if the research project has been accepted by the relevant authorities in the organisation after several examinations; these include the purpose and duration of the research, the availability of the necessary financial resources, and the researcher's qualifications. Although there is no minimum salary set by the Directive, the researcher must have sufficient economic resources and a sickness insurance. Researchers in order to enter the Member States must present a valid passport, the hosting agreement, and a statement of financial responsibility issued by the research organisation.

45. The residence permit issued to non-EU researchers is valid for one year or more and it could be renewed annually. If the research project lasts less than a year, the residence permit must be issued for the duration of the project. This permit allows researchers to enter and reside on the territory of the Member State which has admitted them and to conduct the research project there. This residence permit allows mobility for part of the research project to be conducted on the territory of another Member State.

46. Signatory Member States were required to transpose the Directive by 12 October 2007. By December of the same year, the Commission launched infringement procedures against 12 Member States that did not transpose the Directive in time.¹⁸ Since then all Member States eventually adopted transposition measures. Denmark and the United Kingdom are not bound by this Directive.

Descriptive Evidence

47. A report commissioned by the European Commission (ICMPD 2011) found that the Researcher Directive had a positive impact on inflows of third country national researchers to Europe. This analysis shows that over the period 2007-2010 15 Member States, for which statistics on permits are available,

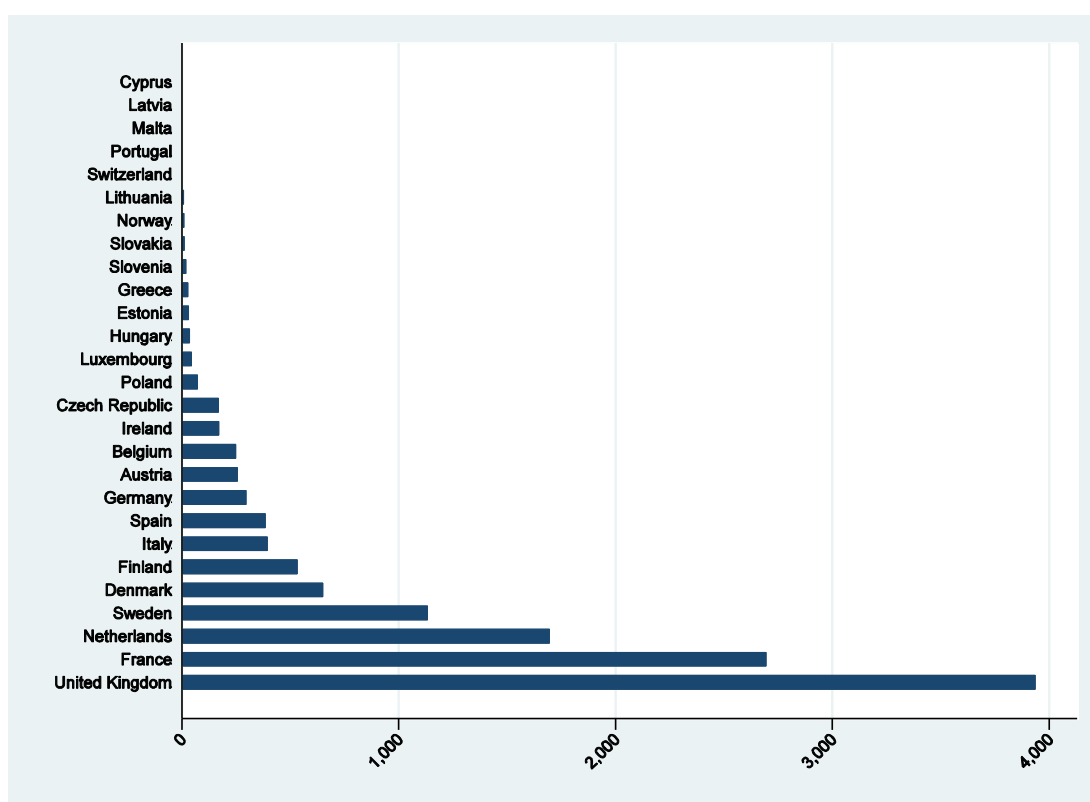
17. The research organisation status is valid for five years and can be renewed if the conditions are still met.

18. These Member States are: Cyprus (4/2008), Czech Republic (12/2007), Estonia (11/2007), Finland (8/2008), Greece (9/2008), Italy (1/2008), Lithuania (2/2008), Luxembourg (8/2008), Malta (3/2008), Slovak Republic (5/2008), Spain (12/2009), Sweden (7/2008).

recorded increases that range from 46% to 500% in the annual inflow of foreign scientists. However one has to exercise some caution in interpreting these increases as a direct consequence of the adoption of the Directive. The figures presented in the report are likely to capture time-trends of this type of migration, they may also reflect a shift from one immigration classification to a new one, e.g. the researcher classification, that did not exist before the implementation of the Directive.

48. Figure 10 shows European destinations of third country national researchers in 2012;¹⁹ among top destinations, two countries (Denmark and the UK), did not adopt the Directive; it thus seems that the rise in the number of researchers arriving in Europe may be correlated to factors other than the implementation of the Directive, such as a quality improvement of European research organisations. In 2012 about 3,800 and 2,600 researchers entered the United Kingdom and France, these two countries alone attracted more than 50% of all newly arrived scientists in that year.

Figure 10. Inflow of third country national researchers: top destinations



Notes: Data come from Eurostat database and they refer to first residence permits issued to non-EU researchers in 2012.

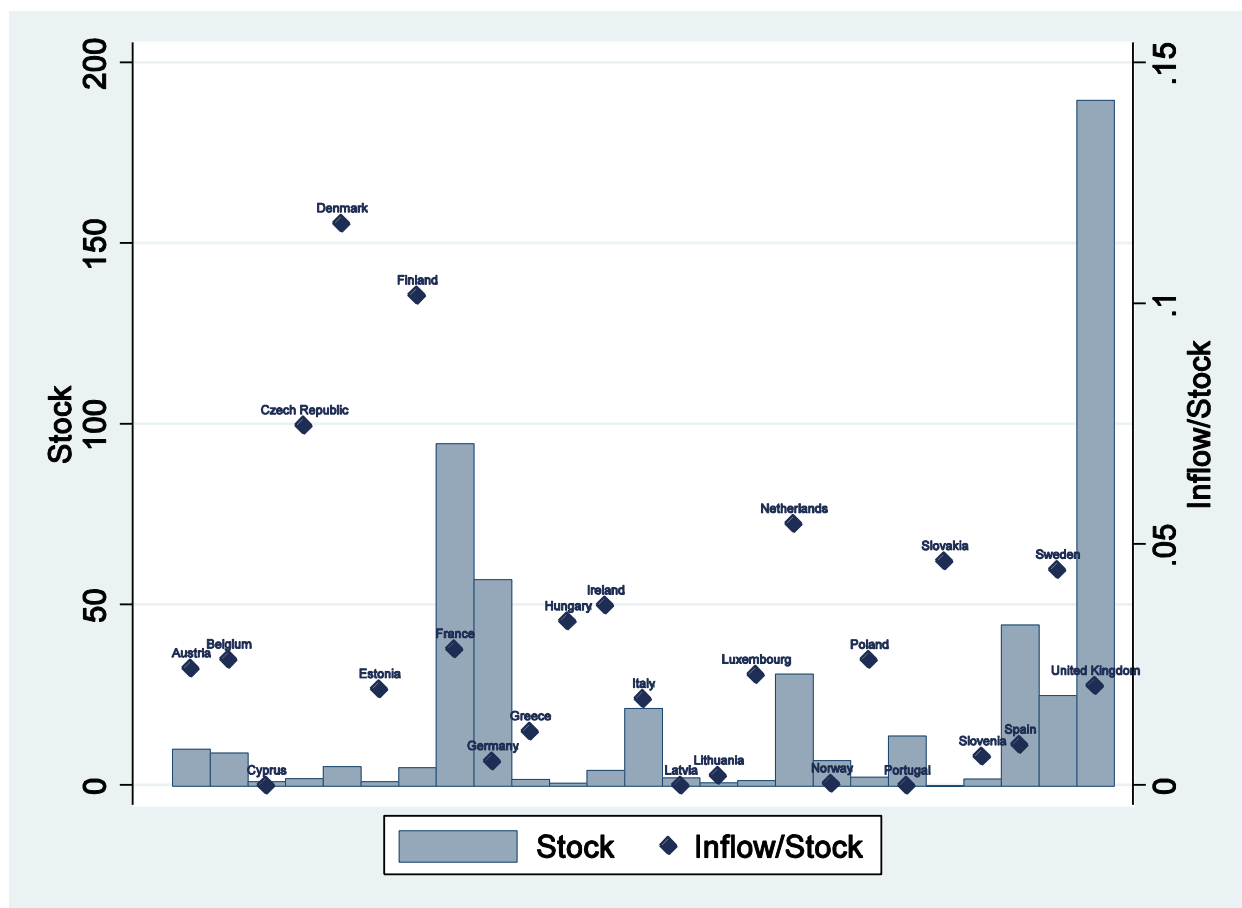
49. Figure 11 compares the magnitude of these flows to the stock of researchers already living and working in Europe. I use the European Labor Force Survey to estimate the number of third country national researchers living in each European country.²⁰ Vertical bars report the stock of non-EU researchers

19. Data come from Eurostat database, the variable migr_resocc provides the number of third country nationals entering each member state as researchers. It should be noted that this category is not homogenous across countries and over time. Some countries may classify researchers as immigrants entering the country for other remunerated activities. Some other countries introduced the researcher category after they implemented the Directive.

20. Data come from Eurostat database, the variable migr_resocc provides the number of third country nationals

in each European country in 2012.

Figure 11. Inflows and stock of third country national researchers in Europe



Notes: The figure reports the ratio between newly arrived researchers from non-EU countries and the stock of non-EU researchers already living in each host country in 2012. Vertical bars represent the number (on the left hand-side Y-axis, in thousands) of non-EU scientists. Eurostat provides number of first permits issued to researchers. To estimate the stock of non-EU researchers I used the European Labour Force Survey.

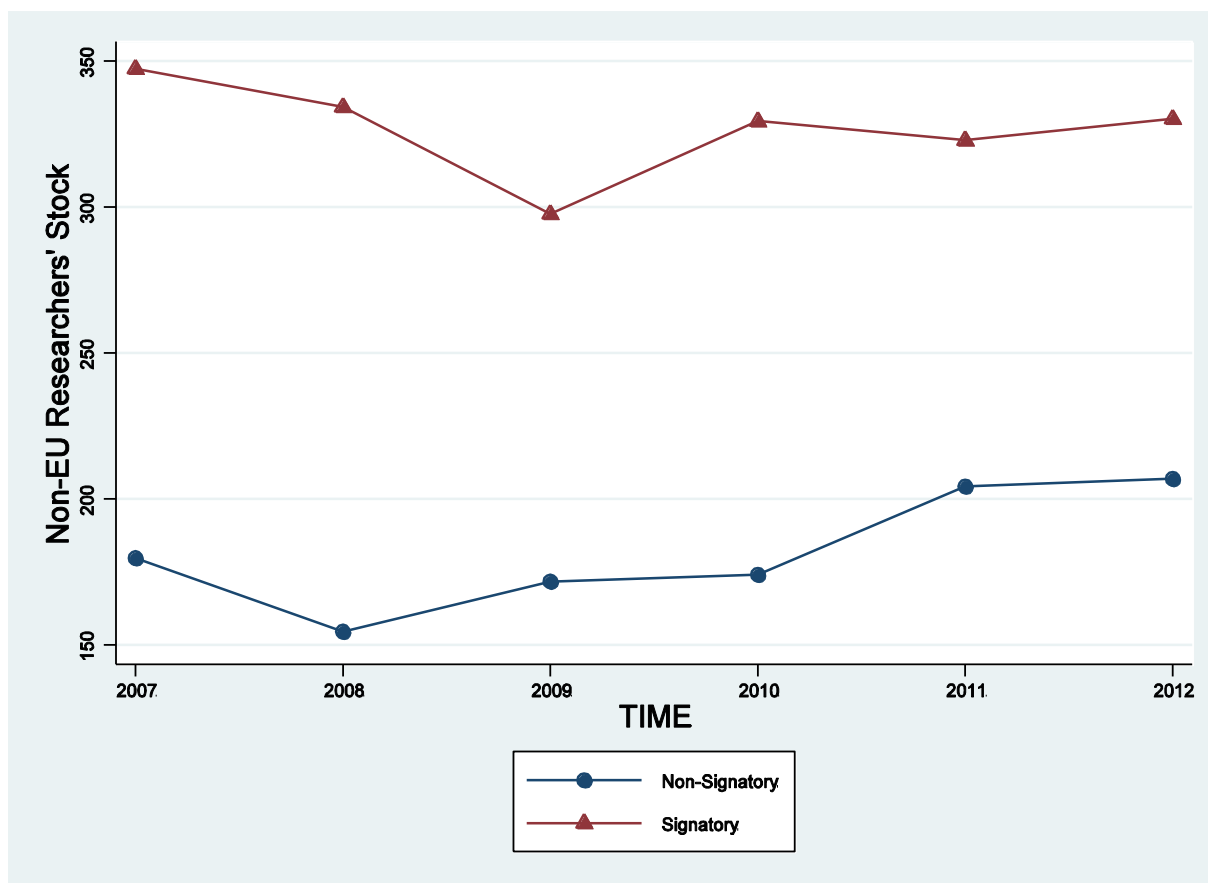
As we have seen from Figure 10, top destination countries are France and the United Kingdom, hosting about 90,000 and 189,000 non-European researchers. The ratio between new permits and the stock of this category of immigrants (i.e. blue squares) is relatively large in Nordic countries, such as Denmark and Finland, which is about 12 and 10 percent respectively. These figures are similar to the ones shown in Figure 6, it does not seem that the Researcher Directive targeted more non-EU researchers in signatory States than national schemes in non-signatory countries.²¹ To support this claim, Figure 12 shows the evolution of the stock of non-EU researchers for both signatory and non-signatory States over time. After

entering each member state as researchers. It should be noted that this category is not homogenous across countries and over time. Some countries may classify researchers as immigrants entering the country for other remunerated activities. Some other countries introduced the researcher category after they implemented the Directive.

21. The zero share for Portugal and Norway is due to the fact that EU-database does not provide information on the number of permits issued to non-EU researchers.

the year of adoption, the two lines seem to follow a similar path.

Figure 12. Stock of third country national researchers in Europe over time



Notes: The figure reports the evolution of the stock (in thousands) of non-EU researchers living in each host country over time. To estimate the stock of non-EU researchers I used the European Labour Force Survey. Signatory States are EU-25 countries but Denmark, Ireland and the United Kingdom, which compose the group of non-signatory countries (plus Norway).⁵⁰ Before turning to the econometric analysis, it is worth highlighting two conclusions of the report mentioned at the beginning of this section (ICMPD 2011). First, the aim of the Directive to speed up the entry of qualified foreign scientists has so far not been sufficiently realised: 61% of the third country national researchers stated that they had to wait from one to three months to complete the application process. Second, there has not been a uniform implementation of this directive among Member States, in particular concerning the time that it takes to an organisation to be approved as a research organisation. Anecdotal evidence suggests that this last point is a serious concern; Bocconi University, one of the top Business Schools in Italy and Europe, was granted the status of *research institution* only a year after its application to the Ministry of Interior. Because of this delay, Bocconi lost one of its researchers as it could not provide him with a hosting agreement and hence a residence permit within a reasonable time.²²

Empirical Analysis

51. To assess whether the implementation of the Directive had any effect on inflows of third country national researchers, I use data from the European Labour Force Survey. The advantage of using this dataset is that the definition of the *researcher* category is homogenous among member states and over time;²³ national statistics on the number of permits to researchers are instead subject to re-classification

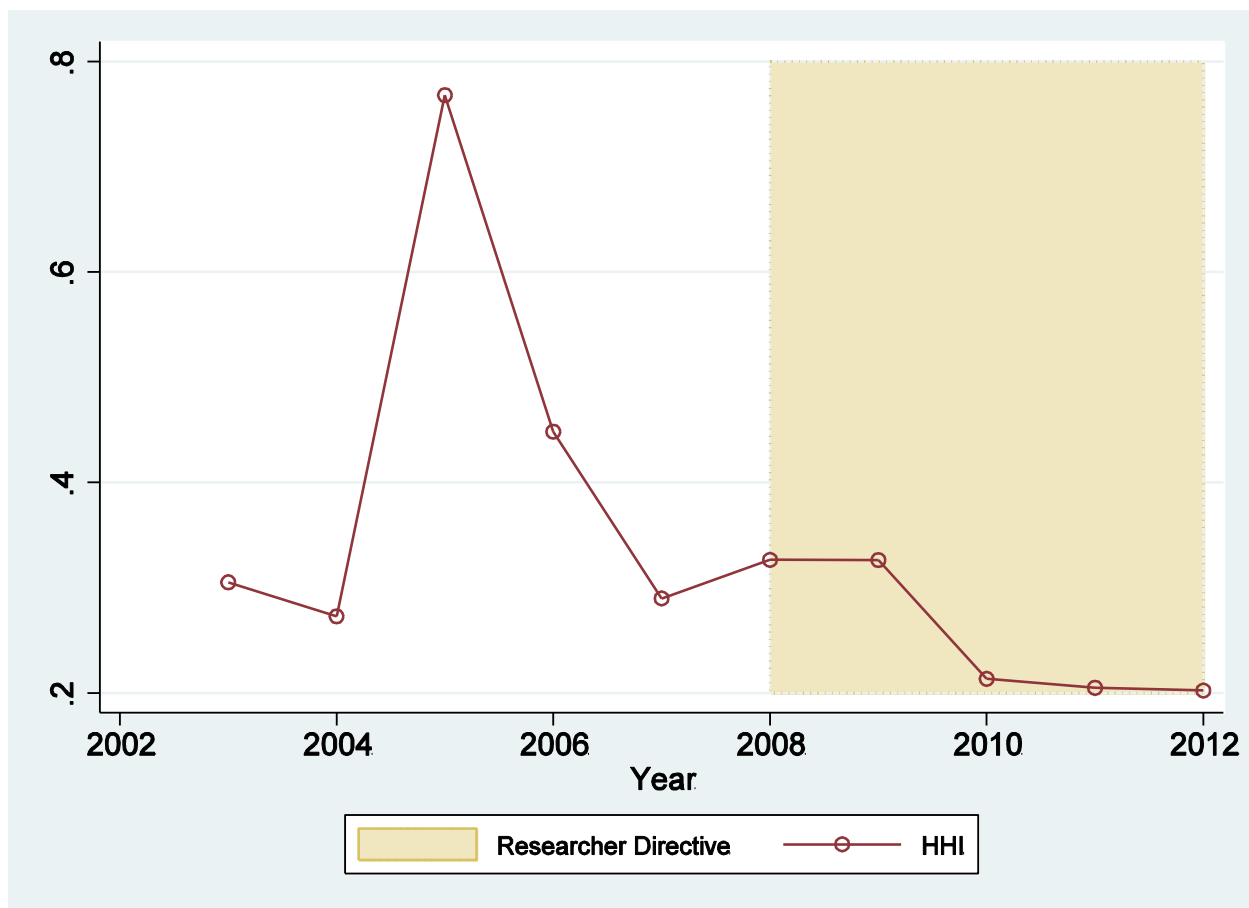
22. This case received a relatively large attention from Italian media, see Corriere.it.

23. Consistently with Figure 12, a third country national researcher is any individual, born outside the EU, living in a Member State, and employed in "Professional, Scientific and Technical Activities. As I focus on newly arrived immigrants, the sample is composed of researchers that were born outside the EU and have

over the period considered.²⁴ The EU-LFS data also cover a larger time-window (2003-2012) with respect to permit data, thus allowing to estimate the DiD model described in Section 3.2.²⁵

52. By employing EU-LFS data, I can compute the Herfindhal index for the "market" of international researchers before and after the Directive was adopted by Member States. The idea behind this approach is that the adoption of the Researcher Directive should have removed barriers to entry for countries that did not have a specific permit for non-EU researchers, e.g. fast track entry scheme for this category of workers. Therefore we should observe an increase in the competition for researchers in Europe after 2008, as a larger number of countries are now able to compete. Figure 13 shows that the level of competition among European countries has increased since 2009, reaching the peak in 2012, four years after the official transposition date. This figure suggests that the effect of the Directive may be delayed over time. As pointed out by Hoffmann (2012), the measures indicated in the Directive are difficult to transpose at a national level, they may require some time to become fully effective.

Figure 13. Herfindhal index and researchers' migration



been living in the host country for less than a year. The EU-LFS provides information on the country of birth (and nationality) as well as the years of residence in the destination country.

24. It may be the case that in some Member States the researcher category was created because of the adoption of the Directive.
25. Data on first permits issued to researchers only go back to 2008, the year in which the Directive was transposed by all signatory States; I thus cannot control for pre-treatment periods.

Notes: The Herfindahl index is computed as $HHI = \sum_{i=1}^N s_i$ where s_i is the share of non-EU researchers entering country i . Data come from EU-LFS.

53. To estimate the effect of the Directive on the inflow of third country national researchers I use the Difference-in-Differences model presented in Section 3.2. I first estimate equation (1), which compares inflows of third-country national researchers to those of European researchers, before and after the mandatory transposition date (October 2007). *After* is a dummy switching to one for years 2008-2012. As described in Section 3.2, since the time of the actual transposition of the Directive across countries may be endogenous, I define the same treatment period for all countries, irrespectively of the actual date in which they transposed it.

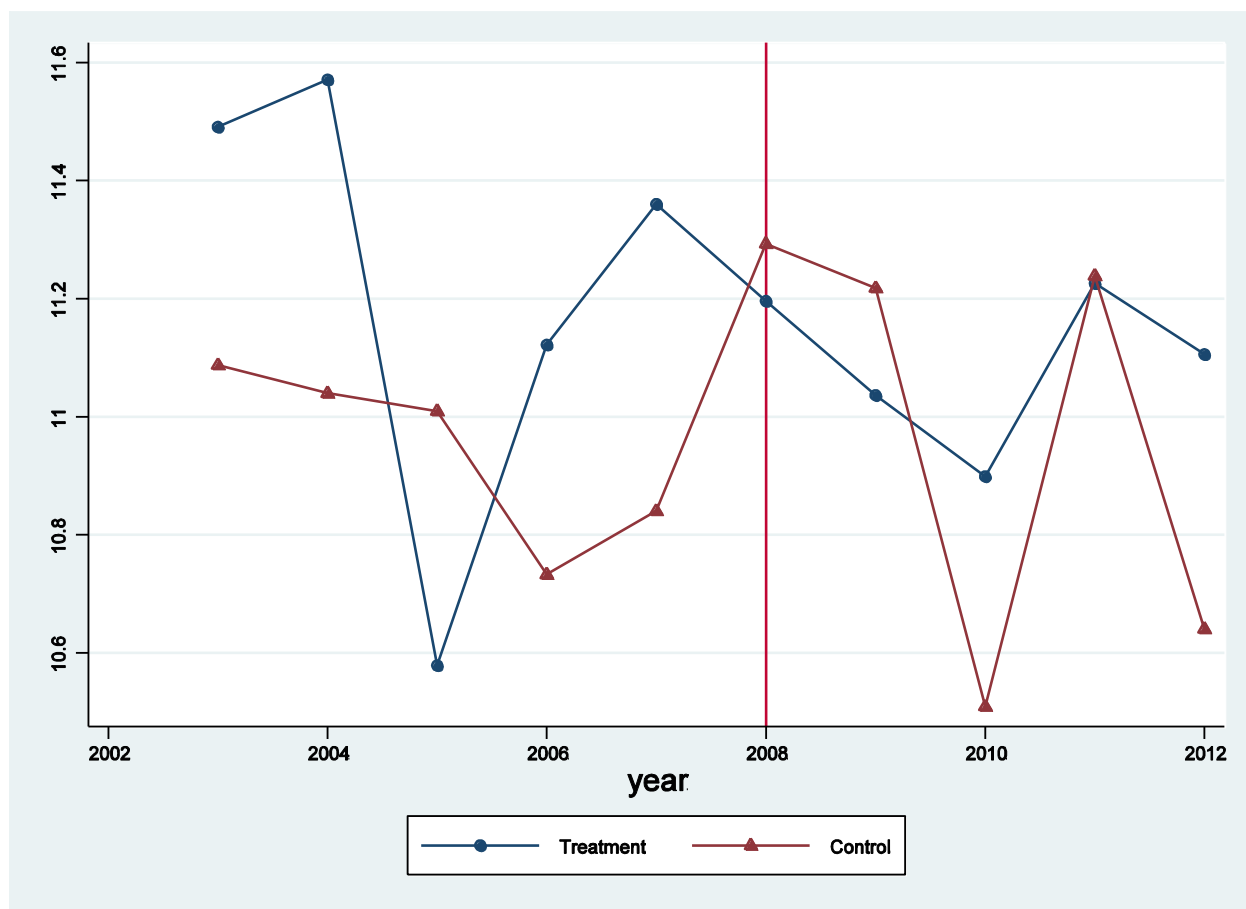
54. To wash out any spurious correlations arising from country-specific factors changing at the same time of the adoption of the policy, I include in the regressions fixed effects for the interaction between destination country and year. The treatment and control group are respectively third country national and European newly arrived researchers within the same country of destination; European researchers constitute a suitable control group as they could be affected by time-varying unobservables influencing researcher flows overall; however, they should not be affected by the implementation of the Directive.²⁶

55. The time window analysed goes from 2003 to 2012, allowing to control for pre and post treatment effects.²⁷ Table 2 provides estimated coefficients from regression (1) (see Annex 2). In column (1) the coefficient is positive: following the adoption of the Directive, the inflow of third country national researchers increased with respect to the inflow of European researchers. However the coefficient is not statistically significant. This is in contrast with previous studies on the analysis of permits to non-EU researchers (ICMPD 2011). One of the reasons behind this discrepancy may be a shift from one immigration instrument to another, with Member States counting non-EU researchers under a new category that did not exist before. Another possible reason has to do with simultaneous increases in inflows also for the control group. Figure 14 shows that the inflow of both European and third country national researchers have diverging trends before the Directive was introduced. Finally, the estimated coefficient may be downward biased if the effect of this policy is delayed over time, as it seems plausible from both descriptive and anecdotal evidence.

26. This country-time specific factors could be reforms targeting the University system, that could have attracted more international researchers independently of the country of origin.

27. Estimating third country national inflows using EU-LFS may be problematic because of small sample sizes, which can be particularly small when focusing on specific subgroups, like third country national researchers. Few countries, like Malta or Finland, did not survey any newly arrived immigrant for the period analysed in this work. These two countries are thus excluded from the empirical analysis.

Figure 14. Inflows of EU and non-EU researchers to Europe



Notes: The figure reports the log number of newly arrived international researchers, distinguishing between third country nationals (treatment) and EU citizens (control). Data come from EU LFS.

56. To further investigate this last explanation, I estimate equation (2), which accounts for pre and post treatment effect of the Directive. The pre-treatment period is composed of years from 2004 to 2006 and post-treatment years are 2008-2012. Column (2) reports estimated coefficients. There is no evidence of pre-treatment effects as all coefficients for years prior to 2008 are not statistically significant. Positive coefficients are recovered for post-treatment years, increasing in magnitude in the last three years after the adoption of the Directive. Again these estimates are not statistically significant.

57. Despite the increase in numbers of permits issued to third country national researchers registered by Member States' statistical offices, the econometric analysis based on EU-LFS does not record any effect of the Directive on the inflows of this category of migrants.

Student Directive (Directive 2004/114)

58. The Council Directive 2004/114 was adopted on 13 December 2004. The purpose of this Directive was to facilitate the entry and the stay of non-EU students and to promote Europe as a "world centre of excellence for studies". All Member States, excluding Denmark, Ireland and the United Kingdom, had to transpose the Directive into their legislation by 12 January 2007.²⁸

59. This Directive set the rules for the admission of third country nationals to Member States for a period longer than three months and for the purposes of studies, primarily concerning higher education. Necessary conditions to get this "study permit" are: the availability of adequate financial resources and admission to an educational institution. Moreover applicants must have sufficient knowledge of the language of the course to be followed, and they have to pay in advance the fees charged by the institution. The duration of the permit is of at least one year and it can be renewed if the holder continues to meet the conditions described above. If the duration of the course of study is less than one year, the permit is valid for the duration of the course. Students are also entitled to be employed by any employer of the host Member States, however the access to economic activities for the first year of residence may be restricted according to national legislation.

60. In 2007 the Commission launched infringement procedures against 11 Member States that did not transpose the Directive in time.²⁹ These procedures were closed as all Member States eventually adopted transposition measures. According to a report issued by the European Commission (COM(2011)587), foreign students still experience difficulties coming to the EU to study, mainly because of an uneven implementation of the Directive.³⁰

61. Another obstacle to the entry of third country nationals is that Member States can decide whether to issue work-permits to third country national students at the end of their studies, thus influencing migrant's decisions to acquire education in a specific destination: access to the labour market during and after completion of studies largely influences migration decisions to a particular destination.

Descriptive Evidence

62. By 2009 all Member States implemented the Directive in their national legislation. Figure 15 uses Eurostat data on international students to show the stock of EU-27 and third country national students in tertiary education in each European country in 2012.³¹

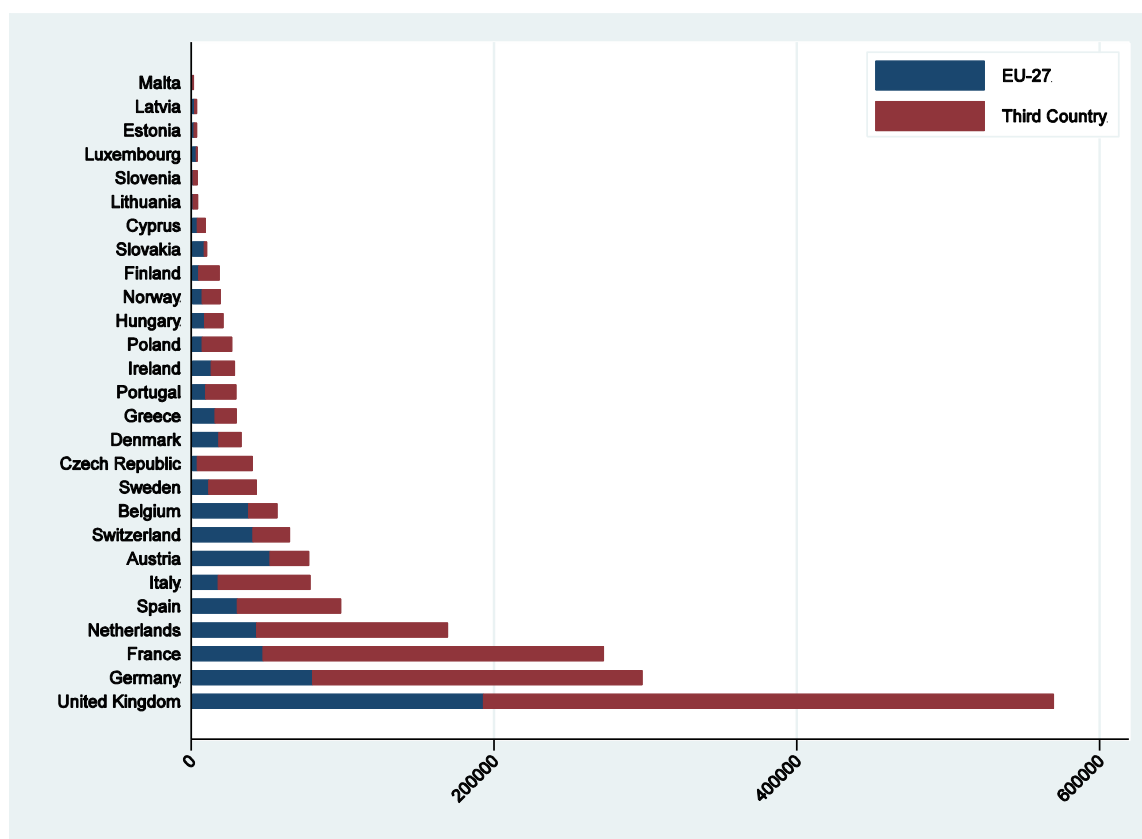
28. The Directive also regulates the conditions under which school pupils, unremunerated trainees and volunteers may enter and stay in the EU. As opposed to the rules on students, which are compulsory for all signatories, Member States may choose whether to apply the Directive to these three categories of migrants.

29. These Member States are: Cyprus (12/2007), Estonia (11/2007), Finland (4/2007), Greece (7/2008), Italy (8/2007), Luxembourg (8/2009), Malta (1/2008), Poland (5/2007), Portugal (7/2007), Slovak Republic (8/2007), Spain (2/2007).

30. The report suggests different amendments to the Directive, in particular: the reinforcement of procedural guarantees; the strengthening of mobility clauses (especially regarding students admitted in a first Member State and that apply to continue their studies in a different Member State); the stimulation of synergies with EU programmes that facilitate third country nationals' mobility into the EU.

31. Eurostat database contains information on international students living and entering Europe every year (migr_resedu).

Figure 15. Stock of international students in Europe



Notes: Data come from Eurostat database and they refer to the stock of international students in 2012.

63. The United Kingdom is the top destination for students from outside EU: almost 400,000 students from outside the EU were living in the UK in 2012. Other main receiving countries are France (224,778), Germany (217,693) and the Netherlands (126,243). Universities in the UK had by far the highest number of students from outside the EU. The success of the UK in attracting international students possibly relies on both the high quality of the education system and the widespread study of English as a foreign language. The Netherlands has a surprisingly high number of third country students, which have been increasing over the years; the growing offer of educational options for international students and better employment prospects for students after the end of their studies are among possible reasons for these figures.^{32,33}

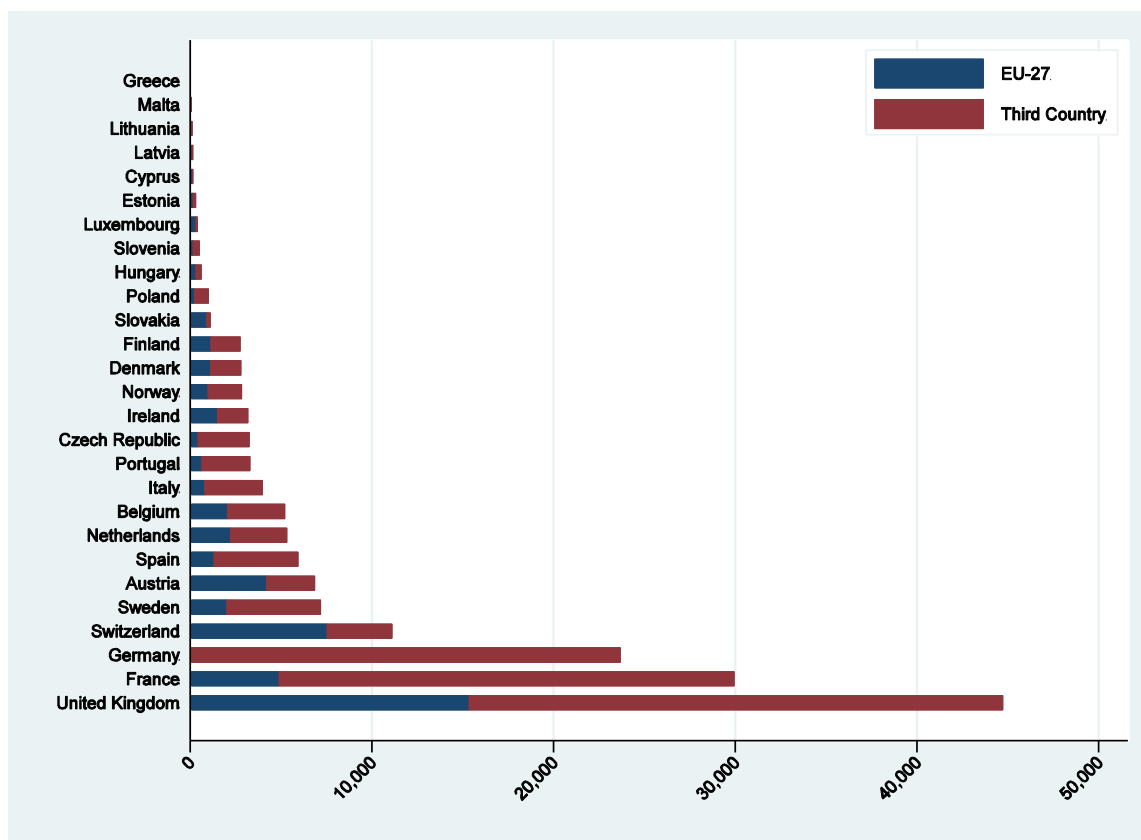
64. Similarly, Figure 16 plots the number of international students (both EU and non-EU) enrolled in the second stage of tertiary education are considered, i.e. master or PhD programs. Again, the UK is the top destination for master or PhD students in Europe, followed by France and Germany.³⁴ Switzerland is among favoured destinations for this category of students, especially among EU students.

32. According to VSNU (a Dutch higher education association), the number of international programmes offered by Dutch universities increased by about 50% from 2010 to 2012.

33. In 2008 the Netherlands introduced a law stating that graduates, who finish their studies in the Netherlands, are automatically granted a permit of stay if they manage to find a job paying an annual salary higher than 25,800 euros (Kahanec and Zimmermann 2011).

34. Eurostat does not provide data for EU students in Germany.

Figure 16. Stock of international students in Europe: Masters and PhDs

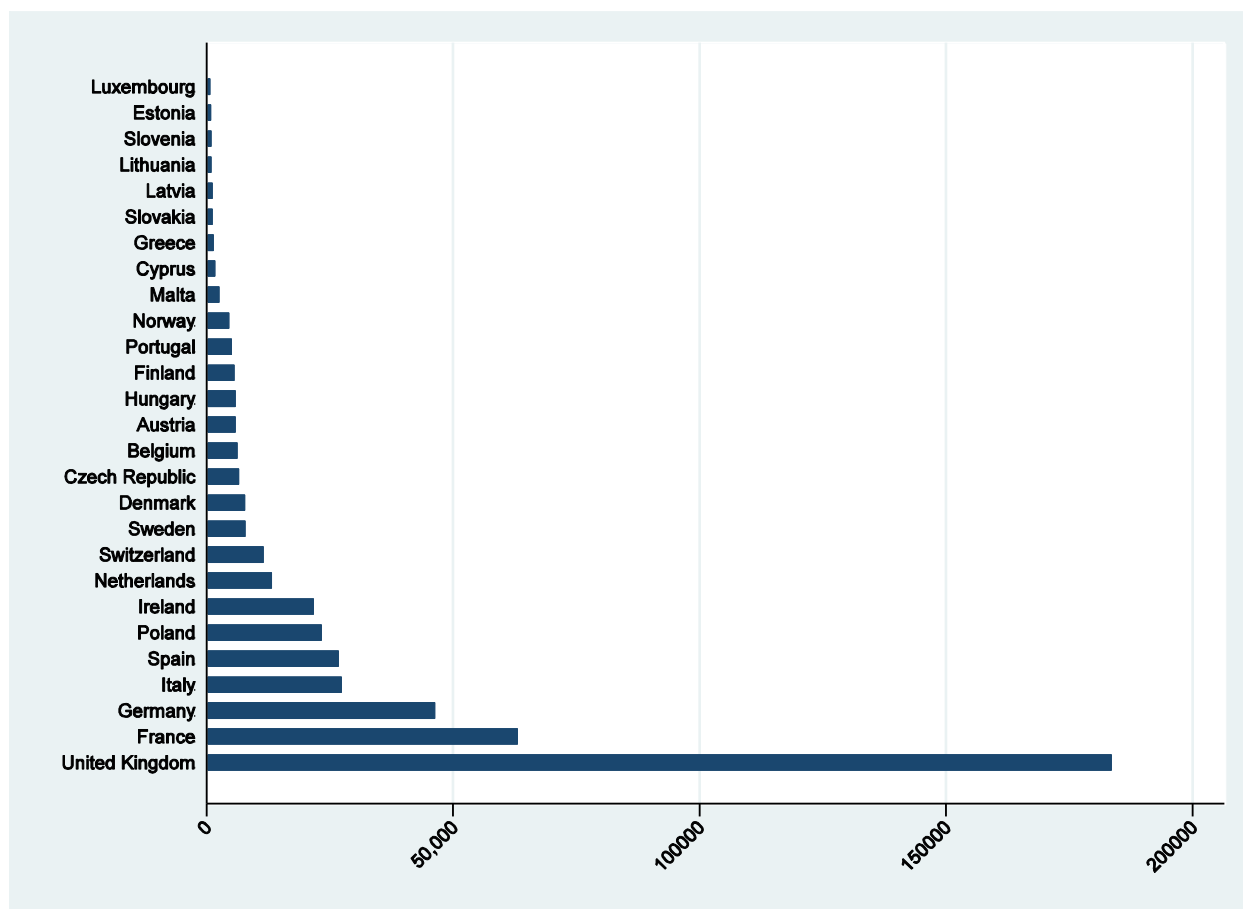


Notes: Data come from Eurostat database and they refer to the stock of international students in 2012. Students are those enrolled in the second stage of tertiary education leading to an advanced research qualification (level 6 of the ISCED97 classification)

65. Annual flows, which are measured by the number of first permits issued to third country national students, show similar figures (Figure 17).³⁵ Countries attracting the largest number of students outside the EU in 2013 are again the United Kingdom, France and Germany: in these countries the size of these flows relative to the stock of international students was 46%, 28% and 21% respectively.

35. The source for this data is still Eurostat Database, as for Figure 15.

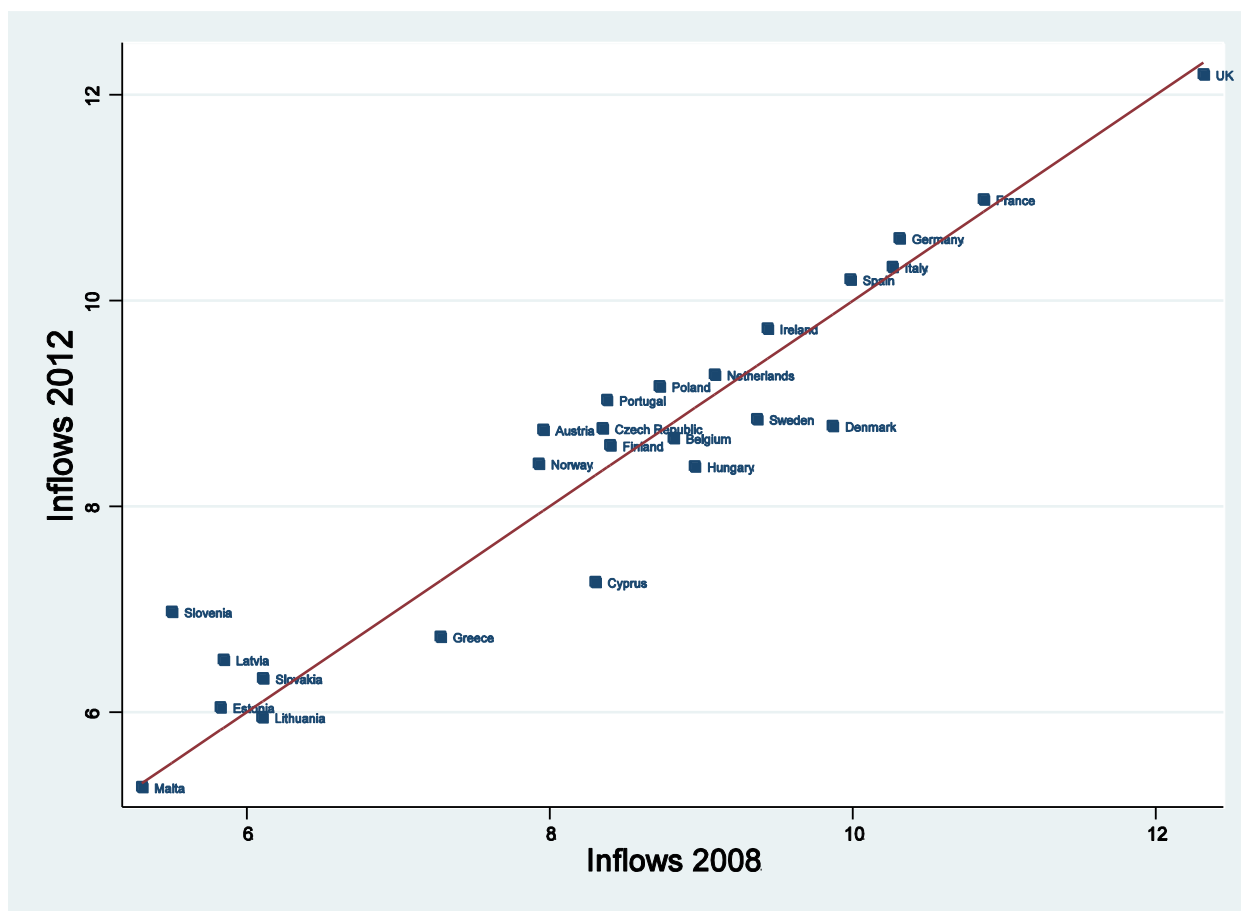
Figure 17. Inflow of third country national students: top destinations



Notes: Data come from Eurostat database and they refer to first residence permits issued to non-EU students in 2012.

66. Since the adoption of the Directive, flows have increased in France, Germany and Spain, whilst Sweden, Greece and Belgium experienced a reduction in the arrivals of students from non-EU countries between 2008 and 2012 (Figure 18). For Sweden the drop may be due to the introduction of tuition fees for international students from outside the EU, which occurred in 2011.

Figure 18. Changes in the number of first permits to non-EU students, 2010-2012

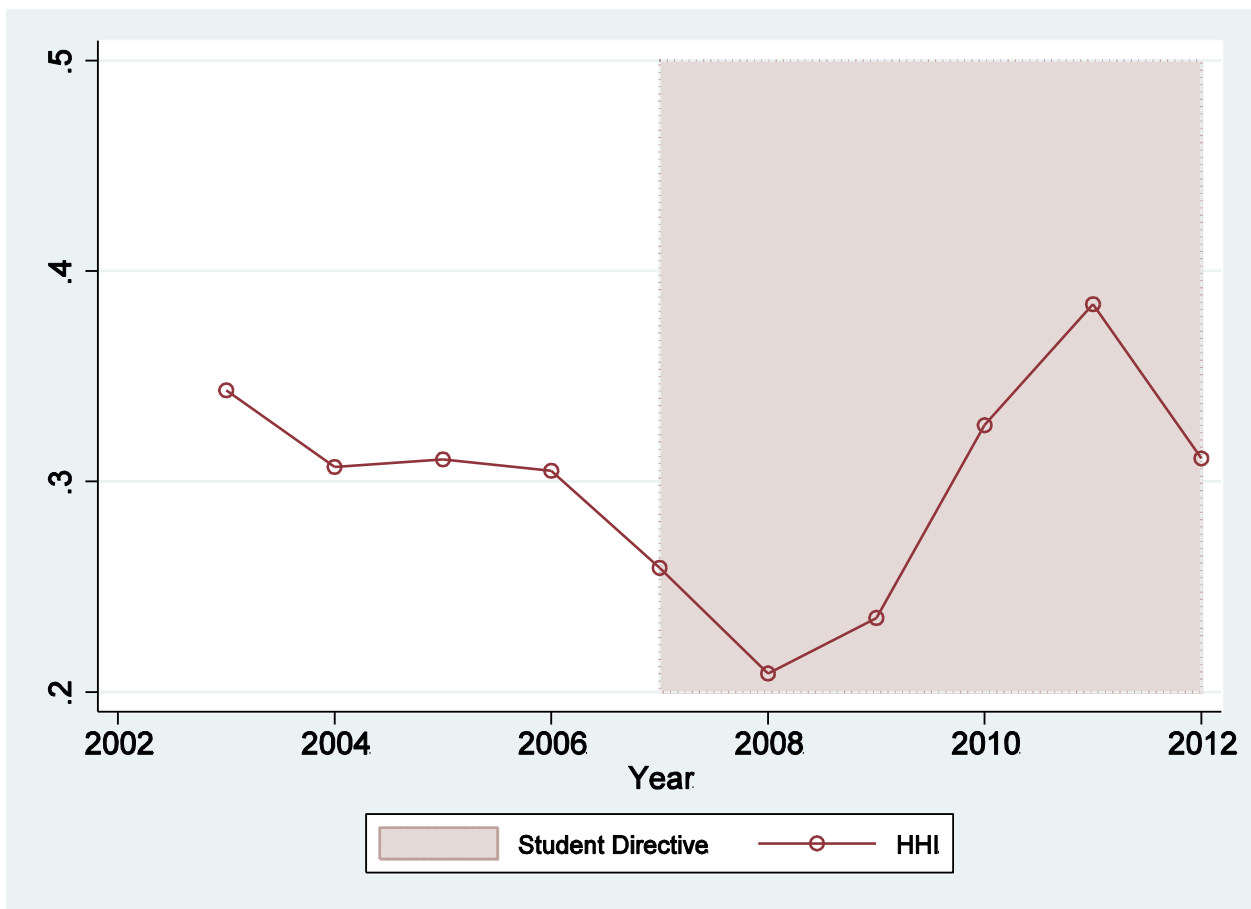


Notes: Data are the same as the ones used in Figure 17. On the vertical axis the log-number of first permits issued to students in 2012 is reported. The same number (in log) for 2008 lies on the horizontal axis. The red line is a 45-degree line.

67. The "market" for international students in Europe seems to be dominated by the United Kingdom. Before assessing the impact of Directive on the flow of migrant students to Europe through the econometric analysis, it is interesting to have a look at Figure 19. This Figure plots the evolution of the Herfindahl index defined in Section 3.1 in Europe over time. Since data on permits to students only go back to 2008, I estimate flows to Europe using the European Labour Force Survey.³⁶ These data allow me to control for pre-treatment periods back to 2003. The Directive should have increased the competitiveness of signatory countries through the introduction of a specific visa for international students.

36. Newly arrived international students are foreign born individuals, 15 years old and older, enrolled in tertiary education system who have been living in the country for less than a year.

Figure 19. Herfindhal index and students' migration



Notes: The Herfindahl index is computed as $HHI = \sum_{i=1}^N s_i^2$ where s_i is the share of non-EU students entering country i . Data come from EU-LFS.

68. The index measuring the market shares for each destination country has started decreasing in the years following the implementation of the Directive. However from 2009 to 2012 the degree of concentration of this "industry" has increased. The reason for this rise is mainly due to the UK institutions enrolling almost one third of newly arrived immigrant students. The value of this index is much higher than the one for the high-skilled, meaning that in this *market* there are only few countries attracting most of the international students. It seems that the quality of the educational institutions, the offer of international degrees, and the recruiting policy at the end of the studies may be more powerful migration magnets than any immigration policies.

Empirical Analysis

69. To assess the impact of the Directive on the inflow of international students I employ the Difference-in-Differences model presented in Section 3.2. Column (1) of Table 3 provides regression results from equation (1), where the dependent variable is the number of international students enrolling in each European country i in year t from region j (see Annex 2).

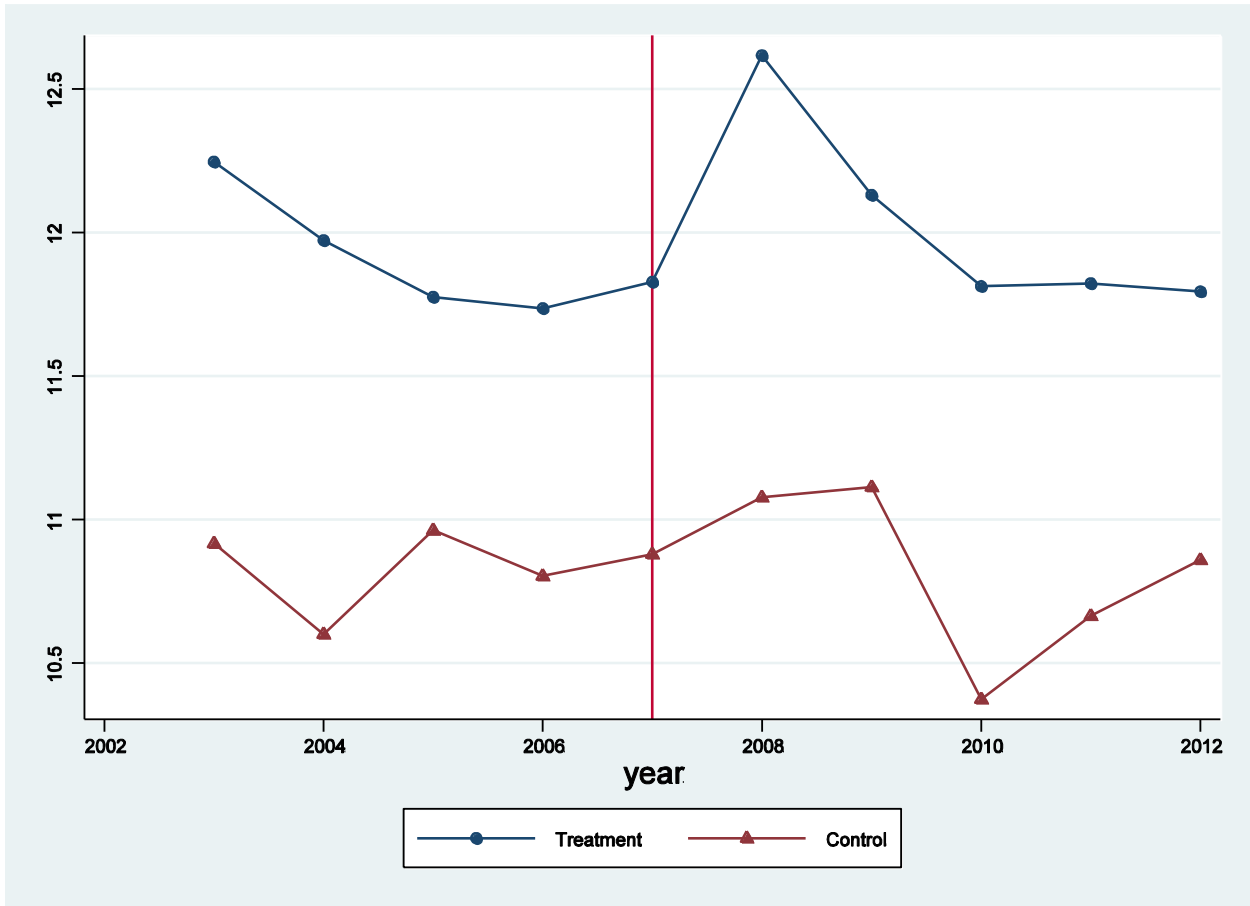
70. I compare inflows of non-EU students to those of EU students, before and after the official transposition date, i.e. 2007. *After* takes value one for years 2007-2012, irrespectively of whether the

Directive was transposed by a country *i*. The observation period goes from 2003 to 2012. The sample comes from the EU-LFS, where a newly arrived international student is any foreign born individual, 15 years old or older, enrolled in tertiary education system, and who has been living in the country for less than a year. The identifying assumption is that the Directive only affected the treatment group, i.e. non-EU students; the use of European students as control group and the inclusion of destination*year fixed effects should wash out any other factors affecting the mobility of all students to a particular destination.

71. The coefficient in column (1) is positive, implying that the Directive's implementation increased flows of third country national students to Europe by roughly 42%. However this coefficient is not statistically different from zero: the Directive seems not to have changed the composition of student inflows to Member States.

72. Column (2) reports pre and post treatment effect. Three years after the transposition of the Directive, non-EU students' inflows to Europe seem to have increased. However all the estimated coefficients are statistically not significant. Figure 20 shows trends of international students' inflows over 2003-2012, distinguishing between third country national (treatment) and EU (control) students. Inflows for both groups seem to be on a parallel trend before 2007; as suggested by estimates in Table 3, these trends do not diverge in the years after the transposition date.

Figure 20. Inflows of EU and non-EU students to Europe



Notes: The figure reports the log number of newly arrived international students, distinguishing between third country nationals (treatment) and EU citizens (control). Data come from EU LFS.73. After controlling for country and year specific unobservables potentially affecting students inflows to a given destination, these results suggest that the implementation of the Directive has not significantly increased the number of international non-EU students to signatory States.

Concluding Remarks

74. The success of countries like Canada, Australia and the USA in attracting skilled workforce has created difficulties for many European States to fill skilled labour positions. In order to compete on the global labour market for skills, the European Union decided to adopt several Directives with the intention to foster EU attractiveness as a destination country for high-skilled immigrants.

75. This paper assesses the impact of three European Directives - Student Directive, Researcher Directive and the Blue Card Directive - on migration flows from third countries to the EU. Using a difference-in-differences empirical strategy and data from the EU-LFS and Eurostat database on work permits to non-EU workers, I estimate the effect of each Directive on the inflow of *targeted* third country nationals.

76. The empirical analysis presented in this work specifically focuses on the impact of EU Directives on inflows of targeted category of immigrants. It has to be noted that other potential effects of the Directives, such as harmonising immigration law across Europe or preventing outflows of third country nationals, are not discussed in this present paper.

77. The Blue Card Directive specifically targeted high-skilled immigrants from third countries. Descriptive evidence shows that the inflow of this category of immigrants has increased in most Member States after the adoption of the Directive, i.e. 2012. However the number of Blue Cards issued in each signatory country is extremely low compared to the number of work-permits granted under existing national schemes. Moreover, the econometric analysis does not provide evidence of any impact of the implementation of the Directive on the inflow of third country skilled workers. The effect is statistically significant for some countries, but it is unlikely to be caused by the implementation of the Directive. It may be too early to draw conclusions about the effect of this policy, employers and potential applicants need to be better informed about the procedures to get the Blue Card, and this may require some time.

78. Despite the increase in the number of permits issued to researchers from third countries to Europe, difference-in-differences estimates do not provide evidence of a direct effect of the implementation of the Researcher Directive on changes in these inflows. The increase registered by national statistical offices is likely to be due to a re-classification of the researcher category after the adoption of the Directive, and to country and time specific factors affecting immigration to Europe overall. Similar results are recovered for the analysis of the Student Directive, there is no clear evidence that the increase in students inflows from outside the EU is due to the adoption of this Directive by Member States. A student's decision to acquire education in a specific country largely depends on employment prospects and labour market access in that country after the completion of her/his studies.

79. These results are in line with what existing literature has found: economic forces play a predominant role in attracting foreign-born workers, especially when immigration policies become less restrictive. However, it could be the case that it is too early to observe any effect of these Directives, since policy changes take time to filter into perception and thus affect immigrant inflows to Europe.

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ANNEX

Annex 1: Data Sources and Definitions

80. This paper uses two data sources: administrative data from residence permit registers and the European Labour Force Survey.

Residence permit data

81. Data on residence permits are provided by Eurostat.³⁷ These are first permits granted to third country nationals during the reference year, disaggregated by citizenship, reason of entry and by the length of validity. The major reason categories are: family formation and reunification, education and study, and remunerated activities. Remunerated activity reasons are divided in four sub-categories: high-skilled workers, researchers, seasonal workers, and other work reasons. For years 2012 and 2013 Eurostat also provides the number of immigrants that were granted a Blue Card for Signatory States.

82. These data only refer to third country national workers, no information on the number of mobile European workers is given, as they do not require a residence permit. There are 164 different citizenships (i.e. countries of origin) and 32 European destinations (i.e. EU-28 Members plus Iceland, Liechtenstein, Norway, and Switzerland). The observation period goes from 2008 to 2013; however, some European destination countries only provide information for the last two years.

83. In the paper I use the number of first permits issued every year by each Member State as a proxy for the inflow of third country nationals to Europe. To the best of my knowledge this is the only dataset providing the actual number of newly arrived immigrants by work reason. For instance, Ortega and Peri (2009) have information on bilateral migration flows, but the data they use do not allow to classify inflows by skill or education.

84. There are several drawbacks, though. First, the classification of the category of immigrant workers may not be homogenous across countries, making thus hard to compare these flows across European States. Second, a category definition may change over time; it could be the case that a particular permit category was created following the implementation of a Directive, as for the researcher category. Finally, there is no information on the socio-economic characteristics of these immigrants, preventing researchers to deepen the empirical analysis.

85. Despite these concerns, the data are particularly suitable to estimate the effect of the Blue Card Directive; this is the only dataset that allows looking at years before and after the implementation of the Directive. The other dataset used in this work, the EU-LFS, does not allow observing inflows in years after the official transposition date, as the observation period stops in 2012.

86. Unfortunately, Eurostat does not provide any number of the stock (i.e. existing permits) of third country nationals by reason of entry. It is not yet possible to look at the effect of the Blue Card Directive on outflows of highly skilled immigrants.

37. Eurostat collects these data from administrative sources (mainly by the Ministries of Interior) on an annual basis.

European Labour Force Survey

87. The second data source used in this work is the European Labour Force Survey (EU LFS), a rotating random sample survey covering households in 33 European States (as of 2012). The data are available from 1983 to 2012 and they provide detailed information on sampled individuals' demographic characteristics, educational attainment, labour force status, occupation, and salary. Information on respondents' country of birth, nationality and duration of stay (if applicable) is also included. Both country of birth and nationality are defined at the macro region level.

88. These data allow me to estimate the effect of both Student and Researcher Directive on immigrant inflows, as they cover a sufficient number of years before and after the implementation of the Directives. Estimates of equations (1) and (2) by employing residence permits would not be possible, as data on residence permits only go back to 2008.

89. Following the empirical literature (Dustmann and Frattini, 2014), I define immigrants based on the country of birth.³⁸ A variable in the data also reports the number of years in which the respondent (if immigrant) has been living in the country. Newly arrived immigrants are then defined as foreign-born individuals, who have been living in the host country for less than a year.

90. In this paper I use EU-LFS to estimate inflows and stocks of international students, researchers and high-skilled workers. International students are foreign born individuals, 15 years old or older, enrolled in tertiary education. I then define a migrant researcher any working age individual, foreign born, tertiary educated and employed in "Professional, Scientific and Technical Activities"; the data provide information on respondents' occupation classified according to the Statistical Classification of Economic Activities in the European Community, NACE Rev.2 (i.e. NACE code "M"). Finally, highly skilled migrants are tertiary educated non-native workers employed in a skilled job, who meet the national salary threshold. Information on the monthly (take-home) pay from main job is available in the EU-LFS data, but this variable only tells the corresponding decile of the wage distribution. I therefore retain workers in the top four deciles, i.e. 7th–10th decile. Skilled jobs are defined according to the ISCO-88 classification of occupations (at one digit level); these occupations are "Legislators, senior officials and managers" (ISCO-88=1), "Professionals" (ISCO-88=2) and "Technicians and associate professionals" (ISCO-88=3).

91. EU LFS classify immigrants according to about twenty macro regions of origin, such as EU 15, NMS-10, North America and so on. As the sample sizes of newly arrived immigrants in these data are small, I aggregate immigrants in two groups: European and non-European born. One limitation of using EU-LFS to estimate flows is the small sample of surveyed migrants, who are likely to be underrepresented in this survey, especially newly arrived immigrants. This becomes a serious concern when defining newly arrived immigrant researchers, the number of respondents falling into this category ranges from three to 600 depending on the year and the country. Finland and Malta are not included in the analysis of Section 4.2 and 5.2 as they do not survey any newly arrived immigrant.

92. The EU-LFS data still remain particularly suitable for the analysis of the Student and Researcher Directives. First, they cover pre- and post-implementation years, which are not covered by residence permit data. Second, the definitions of the researcher and student categories are homogenous across country and over time. Finally, I can define as a control group a comparable group of workers, represented by EU students and researchers, who are not targeted by the Directive as they do not need a visa to work in Europe.

38. The only exception is Germany, which only reports information on respondents' nationality.

Annex 2: Tables

Table A1: Blue Card Directive and inflows of high-skilled migrants

Dependent variable: log(inflows)		
	(1)	(2)
Directive*After	0.011 (0.110)	
Directive*After by country:		
AT		0.072 (0.050)
BE		-0.680 (0.655)
FI		0.061 (0.127)
FR		0.235* (0.100)
DE		0.587 (0.383)
EL		0.128 (0.080)
IT		-0.016 (0.148)
LU		-0.272* (0.118)
NL		0.035 (0.099)
PT		0.099 (0.111)
ES		0.047 (0.197)
Controls:		
Origin*Year	Yes	Yes
Origin*Destination	Yes	Yes
Destination*Year	Yes	Yes
Observations	51,168	1,968

Notes: * p<0.10, ** p<0.05, *** p<0.01. Standard errors in brackets are clustered at the level of the interaction between year t and destination i . The dependent variable in columns is the log of the number of permits issued third-country nationals for work reasons.

Table A2: Researcher Directive and inflows of non-EU researchers

	Dependent variable: log(inflows)	
	(1)	(2)
Directive*After	0.297 (1.748)	
Pre-treatment effects:		
Directive*2003		2.332 (1.732)
Directive*2004		0.888 (1.307)
Directive*2005		0.435 (1.902)
Directive*2006		3.798 (2.717)
Post-treatment effects:		
Directive*2008		1.120 (2.098)
Directive*2009		1.919 (2.082)
Directive*2010		0.112 (6.559)
Directive*2011		2.993 (1.969)
Directive*2012		2.781 (1.802)
Controls:		
Origin*Year	Yes	Yes
Origin*Destination	Yes	Yes
Destination*Year	Yes	Yes
Observations	450	450

Notes: * p<0.10, ** p<0.05, *** p<0.01. Standard errors in brackets are clustered at the level of the interaction between year t and destination i . The dependent variable in columns is the log of the number of newly arrived foreign-born researchers. The benchmark year in column (3) is 2007.

Table A3: Student Directive and inflows of non-EU students

	Dependent variable: log(inflows)	
	(1)	(2)
Directive*After	0.420 (1.001)	
Pre-treatment effects:		
Directive*2003		-2.183 (3.206)
Directive*2004		-0.095 (1.385)
Directive*2005		0.343 (1.139)
Post-treatment effects:		
Directive*2007		-0.646 (1.030)
Directive*2008		-0.384 (1.196)
Directive*2009		-0.372 (1.022)
Directive*2010		1.212 (1.283)
Directive*2011		0.415 (1.178)
Directive*2012		-0.534 (1.033)
Controls:		
Origin*Year	Yes	Yes
Origin*Destination	Yes	Yes
Destination*Year	Yes	Yes
Observations	450	450

Notes: * p<0.10, ** p<0.05, *** p<0.01. Notes: * p<0.10, ** p<0.05, *** p<0.01. Standard errors in brackets are clustered at the level of the interaction between year t and destination i . The dependent variable in columns is the log of the number of newly arrived international students. The benchmark year in column (3) is 2006.