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THE BOLOGNA PROCESS'
IMPACT ON CROSS-NATIONAL
STUDENT MOBILITY
A MULTI-METHOD EVALUATION

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ABSTRACT

The Bologna Process (BP) has induced a remarkable amount of structural higher education policy change in its participating countries. From a program-theoretical perspective, one of the main benefits associated with these changes is thought to be increased student mobility between participating countries. However, due to a lack of suitable data and the highly heterogeneous nature of the newly-formed European Higher Education Area (EHEA), it has thus far remained unclear whether student mobility has indeed increased and, if it has, whether countries benefit evenly. In this paper, we aim to evaluate (1) whether the Bologna Process has led to an increase in degree seeking student mobility within as well as beyond the EHEA and (2) whether the exchange relationships are balanced. Drawing from previous literature on student mobility, we isolate the impact of BP membership from other factors hypothesized to shape mobility flows. Methodologically, we employ a two-fold approach: First, we conduct time-series-cross-section (TSCS) analyses of both in- and outbound degree seeking student mobility ratios, establishing which factors account for the overall attractiveness of higher education systems. Secondly, we take a dyadic approach in order to analyze push and pull factors between pairs of countries. In short, we find that while membership in the Bologna Process does not have an impact on inbound mobility ratios, outbound mobility ratios have indeed increased within the group of BP members. However, although participation in the BP per se does not further inbound mobility or relevance of exchange relationships, cross-national student exchange patterns within this group are more balanced compared to those of non-participants. In conclusion, the BP has failed to establish the EHEA as a favorite destination for degree seeking student mobility.

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1 INTRODUCTION

In recent decades, European universities and other institutions providing higher education have in parallel begun to reform their program structures and engaged in setting up quality assurance systems. Most recently, these developments can be connected to the so-called Bologna Process, whose name is derived from the Bologna Declaration drafted and adopted by European education ministers.¹ The Bologna Process aims at generally enhancing international student mobility beyond Europe's borders (see Zgaga 2006), as student mobility "has always been at the heart of the Bologna Process. It has been conceived both as a transversal action to complement the original action lines of the process and as a key instrument to develop the European Higher Education Area" (Euridice 2012:151). Traditionally, the only European country receiving an important share of non-European students has been the United Kingdom. The Bologna Declaration set the goal to challenge the attractiveness of non-European higher education destinations such as the USA and Australia, by stating that there is a "need to ensure that the European higher education system acquires a world-wide degree of attraction equal to our extraordinary cultural and scientific traditions" (ibid. 1999:2-3). Thus, the Bologna Process aims at harmonizing continental European higher education provision so that it is more compatible with the Anglo-Saxon model, thereby hoping to attract students from non-European countries.

As it is the first attempt to harmonize higher education policies on an international scale, the Bologna Process has aroused much attention in the research community. However, there is still a lack of research on the question of whether the Bologna Process has actually facilitated student mobility and whether student mobility did indeed increase in recent years due to Bologna-induced reform processes at the national level. Moreover, we still lack insights into the relational patterns of these exchanges (e.g. whether they are balanced). Therefore, in this paper we aim to evaluate if and to what extent the Bologna Process impacted student mobility patterns and also explore the characteristics of student exchange patterns between the countries of our sample. More expressly, we aim at answering 1) whether degree-seeking student mobility has actually increased over the last decade, 2) which factors account for different strength in ex-

¹ Depending on the context, the term Bologna Process sometimes also relates to a complex governance structure assuring its operation (Heinze and Knill 2008).

change patterns and 3) whether these exchange relationships are balanced. Utilizing longitudinal data on overall mobility rates as well as student flows between pairs of countries, we employ a two-fold methodological approach in answering these questions. As a first step, we use in- and outbound mobility ratios for Bologna and OECD member countries to describe the trajectory of student mobility as Bologna reforms were implemented (2000-2010). Subsequently, we run TSCS models to investigate determinants of degree-seeking student mobility, including Bologna membership as the central independent variable. In a second step, we analyze relational patterns of degree-seeking student mobility between pairs of countries, by means of dyadic analysis. Again, we provide descriptive statistics followed by a multi-level Poisson regression model. As a result, we offer a comprehensive analytical framework of student mobility and the Bologna Process' impact on it. The remainder of this paper is structured as follows: first, we provide evidence that student mobility was the main goal of the Bologna Process. Then, we discuss factors identified in the literature as influencing transnational student mobility patterns before outlining our approach to evaluate the impact of the Bologna Process on student mobility. This section is followed by a presentation of our empirical analyses, divided into two parts. Before concluding the paper, the different results are discussed in light of the existing literature and theoretical lens applied.

2 THE BOLOGNA PROCESS AND STUDENT MOBILITY

The Bologna Process aims to create a European Higher Education Area (EHEA), to harmonize education program structures as well as to institutionalize quality assurance mechanisms. The Bologna Process is widely regarded as a common attempt to solve problems related to demographic changes, sluggish economic growth, and the impact of globalization: “Countries adhered to the Bologna process to solve long-term problems that they had failed to resolve because of internal resistance” (Charlier 2008:107). Thus, the Bologna Process has “acted as a catalyst for European-wide action to address [these] new international paradigms regarding higher education” (Hoareau 2012:539).

While leaving enough leeway for signatory states to reform their higher education policies according to national contexts and national political preferences, the Bologna framework enables program structures to work in a transparent and harmonious manner across Europe. For this purpose, a number of tools have been developed or adapted for use at institutional and country levels. Foremost among them at the institutional level are the European Credit Transfer and Accumulation System (ECTS) and the Diploma Supplement. Originally introduced as part of the European (Community) Action Scheme for the Mobility of University Students (ERASMUS) framework in 1989, ECTS was solely a credit transfer system at first, but has more recently developed into a credit accumulation system as well. Established by the Lisbon Recognition Convention

(UNESCO 1997), the Diploma Supplement is a transcript of credits from courses undertaken and grades achieved. It has a standard format designed to allow the comparison of qualifications throughout countries participating in the Bologna Process. The diploma supplements are supposed to promote the employability of European citizens as well as to improve international competitiveness of European higher education systems (Bologna Declaration 1999:3). The Bologna Process embraces the definition of Europe developed by the Council of Europe. Thus, it is not limited to European Union (EU) member countries, and the “prospect of inclusion in an immense transnational integrated higher education system attracted many countries on the periphery of the academic system and even at and over the frontiers of Europe, to apply for membership” (Van Damme 2009:43). It has even been argued that for some non-EU member countries, the Bologna Process poses a strategy to pursue European integration starting from higher education, “in an expectation to move in due time to other areas, achieving a free movement of labor being one of the most attractive ones” (Tomusk 2007a:15).

Taking the Sorbonne Declaration as the first substantial policy document for the following reform process, student mobility was stated as *the* main goal of the harmonization process and every successive declaration or communiqué reiterated the commitment of the Minister of Education to further student mobility. Internationally mobile students are defined as “students who have crossed borders expressly with the intention to study” (EUROSTAT 2009:98). The London Communiqué (2007:2) states that “mobility of staff, students and graduates is one of the core elements of the Bologna Process, creating opportunities for personal growth, developing international cooperation between individuals and institutions, enhancing the quality of higher education and research, and giving substance to the European dimension”. In their 2009 meeting in Leuven/Louvain-la-Neuve, the ministers “gave a new boost to mobility in the form of a target to be reached by the EHEA countries: In 2020, at least 20% of those graduating in the European Higher Education Area should have had a study or training period abroad” (Eurydice 2012:151). However, the mobility target was set before statistical data was available to quantify short-term student mobility in Europe and in the world.

Table A in *Annex A* summarizes the explicit commitments in the official Bologna documents with reference to student mobility as well as targets for student mobility that could potentially be measured.² Some of these targets cannot yet be assessed since they refer to future time points and some cannot be assessed in a cross-national perspective. The most important distinction for student mobility is between degree and credit or short-term mobility. Whereas “degree mobility is a long-term form of mobility which aims at the acquisition of a whole degree or certificate in the country of destination”,

² Targets highlighted with bold letters are those that we will analyze in this paper.

short term or credit mobility is defined as “aiming at the acquisition of credits in a foreign institution in the framework of on-going studies at the home institution” (Eurydice 2012:153). One drawback of the data we use for our analyses is that it only includes degree-seeking international mobile students, disregarding short-term study stays abroad, for which such data is not yet available. Hence, our evaluation of the Bologna Process can only make statements about the impact of the Bologna Process on *degree-seeking mobility*.

In a first step, we assess if *degree-seeking* mobility has actually increased during the course of the Bologna Process before investigating factors impacting on degree seeking mobility figures. In a next step, we analyze if the student exchange patterns vary between the sub-samples and which factors account for the strength and degree of balance in cross-national student exchanges. This latter point is especially relevant in the context of the Bologna Process as the Bologna members stated in the 2009 Leuven/Louvain-la-Neuve Communiqué and in the Bucharest Declaration of 2012 that they strive for better balanced mobility in the EHEA.

3 SURVEY OF THE LITERATURE

In the literature, student mobility is approached from a variety of analytical perspectives. For instance, one might find studies that investigate macroeconomic outcomes of student mobility (e.g. *brain drain*³ vs. *brain gain*, see Rosenzweig 2007), the effect of having studied abroad on professional careers (Dwyer and Peters 2004) or even the role of foreign-educated individuals in developing democracies (Spilimbergo 2007). Most scholarly work on the subject matter, however, is concerned with student mobility flows in and by itself. Here, the central question is what factors drive and impede student mobility to and from different countries.

This strand of literature can further be differentiated along two dimensions. The first distinguishes between different rationales (on the individual-level) for studying abroad. On the one hand, what can be called the human capital approach conceptualizes students as rational actors investing in their education with the goal of maximizing their lifetime earnings (Rosenzweig 2006; Beine et al. 2011). In this framework, students pursue their education outside of the country of their origin when the benefits (increased future earnings) outweigh the cost of studying abroad (e.g. tuition fees or housing costs). The second rationale, on the other hand, rejects the notion of students as pure utility maximizers and brings non-pecuniary (or cultural) explanatory factors to the fore (Bessey 2010; Dreher and Poutvaara 2005; Tremblay 2001). For instance, according to this literature,

³ Brain drain is the loss of highly skilled professionals from a source country to a recipient country (Sako 2002: 25).

the existence of migration networks or a colonial link may increase student mobility from one country to the other while language barriers may hamper it.

The second dimension of the literature on the determinants of student mobility is a methodological one: one group of studies looks at student inflows either in individual countries or from a comparative perspective. For instance, Dreher and Poutvaara (2005) examine a set of factors explaining student migration to the U.S. from 78 foreign countries and over time.⁴ Rosenzweig (2006), on the other hand, assesses differences in student inflows in 157 host countries. Naturally, these approaches have different benefits. Focusing on inflows into one country only makes it possible to analyze in detail characteristics of sending countries and model idiosyncratic country-to-country relationships in a sensible way. Assuming a comparative outlook, on the other hand, shifts the perspective to the host countries and provides a broader and perhaps more representative picture of student flows. The second group of studies takes a dyadic approach in which *pairs* of countries are the observational units. This approach allows for a detailed investigation of student flows between countries. For instance, scholars can take into account variables as complex as the distance between countries, the existence of common language, and the stock of non-student migrant networks as predictors for the numbers of students going from one country to another (Beine et al. 2011). Therefore, dyadic approaches are well-suited when the research objective is to determine relations between countries rather than to identify general determinants of student mobility. In the present paper, we will take advantage of both methods in order to establish the overall trajectory of student mobility over time and country-to-country relations with regard to the number international students as well as the balance of mobility flows.

Irrespective of the method employed, the literature has suggested a plethora of factors driving student mobility – with varying success. Perhaps the most utilized variable is GDP per-capita, albeit with differing theoretical reasoning. Bessey (2010), for example, argues that students from countries with a high GDP should study abroad in high numbers because – stated simply – they are more likely to be able to afford it. Dreher and Poutvaara (2005), on the other hand, assume that it is more attractive for students from a low-GDP country to study abroad because of exorbitantly increased private returns. Thus, the direction of the GDP's impact on student mobility flows is unclear. The empirical evidence, however, points towards the latter interpretation to be correct. Geographical location is also used as a variable in virtually all analyses concerned with student mobility. This can, depending on the method, either be done with regard to the distance between two countries⁵ (Beine et al. 2011; Bessey 2010) or by separating coun-

⁴ Bessey (2010) has a similar approach, but focuses on student migration to Germany.

⁵ Distance between two countries is measured by indicators such as the existence of a common border or geodesic

tries by continent or region (Dreher and Poutvaara 2005; Tremblay 2001). Whichever approach is used, geographic location empirically seems to play an influential role: bordering countries exchange students to a larger extent compared to distant countries; moreover, countries in remote regions are less likely to attract (or lose) students. A dynamic that may offset some of the explanatory power possessed by geographical location is language. In dyadic analyses, if two countries have the same primary language, they naturally have increased exchange flows (Beine et al. 2011). In comparative studies, it is often assumed that English – as the world’s lingua franca– improves the attractiveness of HE systems to internationally mobile students while countries without widely used primary languages have an in-built disadvantage (Tremblay 2001). Perhaps hardest to measure are variables concerned with the perceived quality of HE systems. As mentioned before, complicated procedures of estimating private returns to studying abroad have been devised (Rosenzweig 2006 and 2008). Alternatively, international rankings such as the Shanghai Ranking or even the existence of tuition fees as a signaling device for high-quality education (Beine et al. 2011) have been proposed to serve as proxies for the perceived quality of a HE system. Perhaps due to the imperfect nature of these indicators, their explanatory power remains opaque.

In conclusion, student mobility has been investigated by utilizing a variety of both methods and explanatory variables.⁶ In this paper, we aim to offer a comprehensive account of mobility flows by employing a multi-destination multi-origin framework (investigating both inbound and outbound mobility) and taking advantage of comparative as well as dyadic methodological approaches. In doing so, we hope to make a contribution to the literature because, aside from the importance of geographical location, no clear-cut patterns as to which factors structure mobility flows have been established. In our view, part of the reason for this lack of consensus is that most existing studies suffer from a set of limitations. For example, there often is a lack of generalizability due to the focus on individual countries and – as most of the studies are written by scholars of economics – there is little attention paid to political variables such as increased institutional ties between countries (e.g. membership in the Bologna Process). The most serious shortcoming of the existing literature, however, is its questionable conceptualization of student mobility. As we will argue later, increasing absolute numbers of mobile students are largely a function of growing enrolment worldwide. Therefore, if the phe-

distance.

⁶ Factors that have also been hypothesized to impact on student mobility but could not be discussed here due to space constraints include existing migrant stocks, living costs (Beine et al. 2011), colonial links (Tremblay 2001), being landlocked (Dreher and Poutvaara 2005), and the provision of personal freedom (Bessey 2010).

nomenon under question is student mobility over time, one needs to isolate its informational content from the confounding influence of enrolment figures (see section 5.1.1).

4 EVALUATIVE APPROACH

This paper deals with policy evaluation in the sense that we investigate if the policies implemented in the course of the Bologna Process have impacted on student mobility patterns as foreseen in the Communiqués (see Annex A). Hence, we assume a program-theoretical perspective (see Knill and Tosun 2012 for an overview).

Policy programs make statements about how and why program activities and resources will bring about change for the better (Tilley 2004). In relation to the Bologna Process, Bologna participants believe that the introduction of certain structural measures (e.g. ECTS, Diploma Supplement, and modularized program structures) enhances student mobility; thus, upon widespread transnational implementation of these policies, cross-national student mobility should increase.

Claims that a particular policy has been a ‘success’ are commonplace in political life (Marsh and McConnell 2010: 564). Marsh and McConnell seek to remedy the omission of justified claims of policy success by offering a heuristic, which practitioners and academics can utilize to explore the question of whether a policy is, or was, successful (ibid 564). They emphasize the importance of a spatial dimension in the assessment procedure, particularly if policy success is to be assessed comparatively across different countries. Thereby, they define space in terms of polities and what is regarded as success in one political system might not be regarded as success in another; however, there are different degrees of policy success, since a policy may achieve some of its objectives and not others (ibid 577).

To assess the goals that the ministers of education agreed upon in the course of the Bologna Process, we use the heuristic of Marsh and McConnell (2010) (see *Table 1*). Our analyses focus on programmatic policy success, since we take the goals stated in the official documents as reference points for our analysis and disregard to assess the process itself or political goals in connection to the Bologna Process. Within the eleven-year period (2000-2010), we use a medium-term timeframe; the reasoning for choosing this period is that it begins with the onset of the Bologna Process and ends with the launch of the EHEA. We evaluate policy success in relation to the interests of the target group – internationally mobile degree-seeking students – and leave other relevant actors and stakeholders aside. To assess if the Bologna Process actually had an impact on degree-seeking student mobility, we control for membership in the Bologna Process. By including countries not participating in the Bologna Process, it will be feasible to account for effects not triggered by membership to the Bologna Process and to comparatively assess the relevance of changes in student mobility patterns.

Table 1: *Critical choices to be made in assessing policy success*

	Our choices	
1. Form of policy success	Which forms of success is/are being assessed? Process? Programmatic? Political?	Programmatic, since we take targets stated in official documents as starting point for our analyses.
2. Timeframe	What time period(s) are being assessed? Short-term? Medium-term? Long-term?	Medium-term, from the onset of the Bologna Process until the launching of the EHEA (eleven years).
3. Interests	In relation to whose interests is success being assessed, for example, target group? stakeholder? institution? interest group? individual? collective?	Target group, since we focus on internationally mobile students.
4. Reference points	What is the standard by which success is to be judged? Compared to intentions? Compared to policy domain criteria, for example, efficiency and effectiveness? Compared to the past? Compared to ethical or moral principles? Compared to another jurisdiction?	Intentions, since we take the goals stated in the official documents as reference points; compared to the past and to another jurisdiction since we start our comparative cross-national assessment at the onset of the Bologna Process.
5. Information	Is there sufficient and credible information to assess the extent of success?	Yes, UNESCO student mobility database.
6. Policy isolation	With what degree of certainty and credibility it is possible to isolate and assess the impact of a policy from other factors such as other policies or media influences?	Controlling for influences of factors non-related to the Bologna Process.
7. Conflict and ambiguity	What significance should be given to conflicts and ambiguities, and how should they be weighted in the overall judgment of success? For example: <ul style="list-style-type: none"> - process vs. programmatic - short-term vs. long-term - interests benefiting vs. interest losing - one reference point vs. another, for example, moral principles vs. stated intentions - availability of information vs. lack of information - certainty in isolating the 'policy effect' vs. uncertainty being able to do so - one formal objective vs. another formal objective - one informal objective vs. another informal objective - one formal objective vs. another informal objective - unintended consequences vs. actual or indented consequences - foreseeable shocks vs. unforeseeable shocks 	We analyze if the exchange relationships are balanced, and control for Bologna and European Union membership.

Source: Adapted from Marsh and McConnell (2010)

5 EMPIRICAL ANALYSES

In this section, we turn to our empirical analyses of student mobility. We proceed in three steps. First, descriptive data on in- and outbound mobility are presented. Here we argue that the common practice of conceptualizing (and estimating regressions with) student mobility in terms of absolute numbers is problematic and thus propose an alternative solution – the calculation of mobility ratios. The inspection of these ratios reveals substantial variance both between countries and over time, making an explanatory account a worthwhile undertaking. Therefore as a second step we conduct a set of TSCS regressions in order to assess possible determinants of both in- and outbound mobility ratios. Here we are informed both by previous literature as well as by our guiding research objective – evaluating the Bologna Process. Finally, we investigate by means of dyadic analysis which sub-sample contains the most (im)balanced as well as most relevant cross-national student exchanges one the one hand and which factors influence on the extent of exchange relationships as well as to which degree they are balanced on the other.

Before turning to the presentation of the results, we briefly describe data sources used, coding procedures applied and methods referred to in our country-based as well as dyadic analysis. What is common to both empirical investigations is that they investigate Bologna member countries as well as OECD countries not being members to the Bologna Process. However, we excluded those countries with less than one Million inhabitants, countries that did not possess a university sector at the onset of our investigation (e.g. Luxembourg) and countries that changed their statehood status during the period of investigation (e.g. Serbia and Montenegro). This leads to a sample of 48 countries. Additionally, we excluded some of the countries due to too many missing observations on the indicators for the dependent variables (these were Albania, Armenia, Bosnia and Herzegovina, Greece, Israel, Mexico and Ukraine). This leaves us with 41 countries respectively 1640 dyads (see below) as units of analysis for the dyadic analysis, and 384 or 387 country-years for our TSCS analysis (based on 38 and 39 countries, respectively).

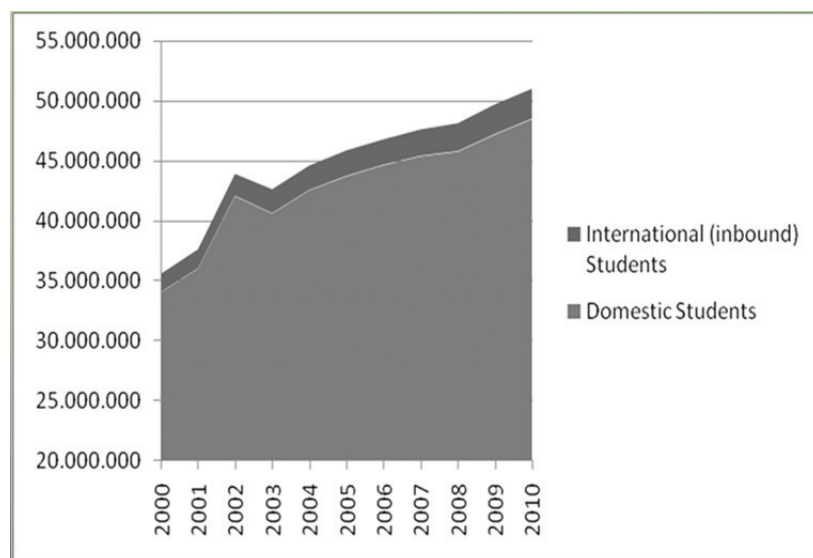
We draw our data from the *UNESCO Institute for Statistics* (UIS) online resources. However, data on enrolment had to be supplemented by OECD resources, as data for time points were absent in the UNESCO database.

5.1 Comparative analyses

As demonstrated above, virtually all analyses concerned with student mobility and its determinants start with the premise that in light of a globalizing world, more and more

students pursue their higher education outside of their home country. As we will show now, these matter-of-fact statements may indeed be reflected in absolute numbers of internationally mobile students. However, they also suffer from a severe underlying misconception. For illustrative purposes, we have aggregated absolute numbers of total enrolment (ISCED 5A+6) and international students studying in any of our sample countries for which comprehensive data were available in the UNESCO database.⁷ In *Figure 1*, the trajectory of both domestic and international enrolment is plotted over time. As can be seen, the number of international students has clearly increased over the past decade. However, this increase in absolute numbers appears concurrently in domestic enrolment, suggesting that underlying factors (e.g. ongoing deindustrialization processes) may drive growth for both types of students. If that is the case, of course, the conventional wisdom about growing student mobility as an independent development would have to be called into question.

Figure 1: Growth in enrolment by domestic and international students, 2000-2010



To add to the argument, *Table 2* displays student numbers more precisely. Again, it becomes apparent that the number of international students has risen sharply: While in the year 2000 a total of 1.61 million foreign students were studying in any of the included countries, by 2010 this number had grown to 2.62 million – corresponding to an in-

⁷ Countries included in our sample were: Australia, Austria, Azerbaijan, Belgium, Bulgaria, Canada, Chile, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Hungary, Ireland, Italy, Japan, Kazakhstan, Korea, Latvia, Lithuania, Macedonia, Moldova, the Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russia, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

crease of 39%. As *Figure 1* already suggested, total enrolment also grew substantially in the same period – from 36.48 million to 51.09 million, or 29%. The correlation between those variables ($r = 0.78$) is quite strong and again suggests that rising numbers of internationally mobile students cannot, as is done so often, be treated as exogenous to enrolment.

Table 2: Total Enrolment & International Students in million and per year.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Δ
Total Enrolment	36.48	37.40	44.92	42.71	45.17	46.74	47.16	48.59	49.20	50.78	51.09	29 %
International Students	1.61	1.69	1.95	2.14	2.20	2.26	2.25	2.41	2.54	2.69	2.62	39 %
Share of International Students %	4.44	4.52	4.34	5.02	4.86	4.84	4.77	4.96	5.17	5.29	5.13	14 %

Notes: Δ refers to percentage change in between years 2000 and 2010. Included countries are those found in Footnote 11.

If one wants to analyze the trajectory of student mobility independently, it is therefore advisable to utilize ratios depicting the share of international students in total enrolment. As is also shown in *Table 2*, calculating such ratios reveals that student mobility has indeed increased over the past decade, but not nearly as profoundly as most of the related literature would lead to believe. In the year 2000, the share of international students in domestic enrolment was 4.44% and by 2010, this figure had gone up to 5.13%. This corresponds to a 14% increase in total.⁸ In conclusion, it is fair to say growth in student mobility has only moderately outpaced growth in enrolment. Conceptualizing student mobility in terms of ratios, we would argue, provides a more precise picture of its extent and its trajectory in a descriptive sense. It also is a measure well-suited to serve as the dependent variable for analyses investigating determinants of student mobility comparatively – as is done in the next section – because it isolates the phenomenon under question (student mobility) from the confounding influence of enrolment.

As mentioned, the figures above contain aggregated data from most of our sampled countries. This has been done strictly for illustrative purposes. What they do not tell us, however, is how mobility ratios have developed in individual countries. Since the goal of this paper is to assess student mobility in both a comparative and longitudinal way, we proceed by providing country-level data. In accordance with the argument made above, we utilize mobility ratios rather than absolute numbers of mobile students. Fortunately, the UNESCO provides student mobility ratios for both inbound (referring to

⁸ Compare this annual increase of 1.4% to the 9% annual increase Beine et al. (2011) found in between 2000-2008 utilizing absolute numbers only.

foreign students coming in) and outbound mobility (referring to domestic students going out). In both cases, the denominator used to calculate the ratios is total domestic tertiary enrolment.⁹

In *Figure 2*, both outbound and inbound mobility ratios are plotted for each country in the sample.¹⁰ From inspecting these graphs, a few observations can be made. First, data on mobility ratios unfortunately is not available for all countries and all years under consideration, which is a shortcoming we have to cope with methodologically (see below). Substantively, a good bit of variance between countries is revealed. There are cases in which high inbound mobility ratios suggest HE systems are attractive to internationally mobile students (such as Australia, Austria, New Zealand, and the United Kingdom) and those which – as denoted by high outbound mobility ratios – are losing students to foreign institutions (such as Albania, Ireland, and the Slovak Republic). In most countries, however, inbound mobility figures are higher than for outbound mobility, which runs contrary to the figures reported in the latest Stocktaking Report, where the “majority of countries reporting on total mobility flows record more outward than incoming students” (Eurydice 2012:156). The higher inbound mobility figures we detect are most likely due to a sample selection bias in our data as many countries that figure to be at the other end of the spectrum (such as China or India) are not included. In accordance with the aggregated data presented above, there is no clear-cut pattern of trajectories over time.

As indicated by the summary statistics in *Table 3*, both mobility ratios have – on average – increased over time (1.38% for inbound mobility, 1.09% for outbound mobility). However, there are stark differences between sample countries: for some, mobility rates have increased by 9 or 10 percentage points, whereas for others, we even observe a decrease over time. There also is considerable variance between sampled countries with standard deviations of 5.10 (inbound mobility) and 3.18 (outbound mobility). In conclusion, this observed variance begs the question: What accounts for differences both between countries and over time? In the following section, we will try to answer this question by testing the explanatory power of a variety of factors, including membership in the Bologna Process.

⁹ Because students are always counted in the country in which they are enrolled in, there is an important difference between inbound and outbound mobility ratios. In the case of inbound mobility, the measure yields the share of international students in total enrolment. In the case of outbound mobility, it is the number of outgoing students compared to total enrolment.

¹⁰ For this part of the analysis, the following countries are removed from the sample due to missing data: Azerbaijan, Bosnia, Bulgaria, Canada, Cyprus, Macedonia, and Moldova. Data for Germany are also missing in the UNESCO database, but have been provided by the German federal statistical office and are thus included.

Figure 2: Outbound- and inbound mobility ratios for countries in sample, 2000-2010



Table 3: Summary statistics for inbound and outbound mobility ratios

Variable		Mean	Std. Dev.	Min.	Max.	Obs.
Inbound mobility ratio	Overall	5.26	5.10	0.50	21.47	N = 380
	Between		4.86	0.69	17.95	n = 38
	Within		1.38	-2.58	10.43	$\overline{T} = 10$
Outbound mobility ratio	Overall	3.70	3.18	0.56	26.19	N = 384
	Between		3.60	0.77	20.89	n = 39
	Within		1.09	-2.80	9.79	$\overline{T} = 9.84$

As outlined in the previous section, in the TSCS analyses, in- and outbound mobility ratios serve as dependent variables. As indicated by Table 3, our original sample of 48 countries shrinks to 38 (inbound mobility) and 39 (outbound mobility), respectively, due to missing data.¹¹

5.1.1 Independent variables for TSCS analyses

Our main research objective is to assess the impact of membership in the Bologna Process on student mobility. Given its goal to increase student mobility per se, we would expect a positive relationship between membership and both our dependent variables, *ceteris paribus*. Since member countries are highly heterogeneous with regard to many variables thought to shape student mobility flows, however, we need to include a plethora of additional variables to isolate its impact. In choosing these, we rely on prior literature on student mobility. As outlined in the survey of the literature, both time-variant (GDP per-capita, enrolment, and perceived quality of higher education) and time-invariant (location of country and primary language) variables have been hypothesized to possess explanatory power.

Bologna member consequently is a dummy variable indicating whether a country was a participant in the Bologna Process in a given year. For founding countries, this variable is set to ‘1’ for all years under consideration and for countries joining later in the decade, the indicator varies accordingly. We also include a variable dubbed *Length*

¹¹ We have included all countries for which five or more observations were available. Inbound mobility ratios were available for years 2000-2010 ($T = 11$) while outbound mobility ratios were only available through 2009 ($T = 10$). The total number of observations is close to equal because sample attrition is much higher for inbound rather than for outbound mobility due to missing observations. More specifically, 130 country-years could not be included in inbound mobility models (attrition of 24.6%) and 79 country-years had to be left out of outbound models (attrition of 16.4%).

of *Bologna membership* in the country-based analyses, which specifies the number of years a country has been participating in the Bologna Process. The rationale of including such a variable is that BP membership may generate increasing returns over time. As new study-programs in accordance with the two-cycle degree system in ECTS are implemented, the volume of student flows both in- and outbound may increase.

While total tertiary *Enrolment* is already included in the values of the mobility ratios, there is a substantive reason to include it as an independent variable in the country-based analyses as well. The number of students in tertiary enrolment (ISCED 5A + 6), we would argue, indicates the level of opportunity to study in a given country. HE systems in countries with high enrolment (and thus a high number of universities) may supply aspiring international students with more options than those with low enrolment. Likewise, students may be more likely to study in a foreign country when domestic opportunities are constrained due to an underdeveloped HE system.

In order to measure the perceived quality of different HE systems, we rely on the *Shanghai Ranking*. This ranking aims to identify the top 500 universities worldwide and ranks them according to criteria such as number of Nobel laureates and faculty citation counts. The Shanghai Ranking may be an imperfect indicator for the perceived quality of HE systems, as it does not, for example, address teaching quality. Moreover, it assesses individual institutions rather than the quality of national HE systems. However, we would argue that it does provide at least some substantive information about the relative attractiveness of different HE systems. Therefore, rather than aggregating the number of top universities and creating a continuous variable (as, for example, Beine et al. (2011) have done), we divide countries into three groups.¹² We do so in order to mitigate the influence of an extreme outlier, the United States, and because we assume the relationship between the number of ranked universities and mobility ratios is not of a linear nature. The reference category consists of countries in which no university appears in the Shanghai Ranking ($n = 10$), the second group comprises countries with less than six ($n = 13$) and the final group countries with more than six ($n = 14$) ranked universities. At least, this should allow us to judge differences between the countries without ranked universities and the top group. Unfortunately, however, the Shanghai Ranking only exists since 2003 so that we would lose a substantial amount of observations if we made the variable time-variant.¹³ Thus, we have decided to base our grouping on the average of ranked universities in between the years 2003-2010.

¹² This also has the advantage that it mitigates the leverage of an extreme outlier, the United States.

¹³ In addition, the variable is characterized by very little variance, making it unnecessary to conceptualize it as time-variant.

The variable *English* is a dummy indicating whether the official language of a country is English (=1) or not (=0). As it is the language spoken most widely around the globe, one would expect English-speaking countries have a built-in advantage in attracting international students. In terms of outbound mobility, the hypothetical relationship is less clear. One could assume, for instance, that the propensity to learn a foreign language is less pronounced in English-speaking countries and thus the cost of studying in a non-English country is heightened, leading to lower outbound mobility ratios.

Geographical location has also been hypothesized to impact on student migration. While we cannot take into account geographical distance in the comparative part of the analyses, we include a variable, *Region*, which simply indicates geographic location. Again, we rely on the groupings provided by the UIS and construct a set of dummies for each category. Accordingly, the reference category is *Central & Eastern Europe* ($n = 14$) and additional groupings are *Central Asia* ($n = 3$), *East Asia and the Pacific* ($n = 4$), *Western Europe* ($n = 17$) and *Americas* (denoting South, Middle and North America, $n = 3$). As for hypotheses, one could construct an argument stating that mobility should be low in remote regions (such as East Asia and the Pacific) and that it should be higher in regions that are easily accessible to a bigger fraction of the overall student population (such as Western Europe). However, the purpose of the region variable in this context is rather to absorb regional idiosyncrasies. Since the Bologna Process spans three highly heterogeneous regions, it seems reasonable to evaluate its impact under statistical control of these imbalances.

GDP per-capita is available on a year-to-year basis from the UIS. As a proxy for the economic prosperity in a given country, it is assumed to exert a positive influence on inbound mobility and a negative one on outbound mobility. With regard to similarity in overall economic performance, two effects might be present. On the one hand, students from countries with a relatively high GDP per capita might prefer study destinations in countries with comparable economic performance. On the other hand, students from countries with low GDP per capita might choose study destinations in high GDP per-capita countries. The reasoning behind both mechanisms might be that students predominantly seek quality education and expect this to be provided by universities situated in high GDP per capita countries.

As has become clear, the structure of our data is longitudinal in that we have multiple observations for each country at different points in time. Within the dataset, we have observed considerable variance both between countries and over time. Since we have a substantial interest in both of these variance types and also want to test for the impact of time-invariant variables (such as *English*), we have chosen to run hybrid regressions that combine the advantages of fixed-effects (absorbing unit-specific heterogeneity) and random-effects models (inclusion of time-invariant predictors). Formally, the estimation

Table 4: Hybrid regression estimates for inbound mobility ratios +

VARIABLES	Model 1	Model 2	Model 3	Model 4
Bologna member	0.551 (-0.516)	0.342 (-0.516)	0.410 (-0.524)	0.353 (-0.527)
Length of membership		0.129*** (-0.041)		0.047 (-0.0556)
GDP per capita			0.000116*** (-3.09E-05)	9.23e-05** (-4.18E-05)
Enrolment			-1.22E-07 (-3.26E-07)	-1.03E-07 (-3.29E-07)
English			5.245** (-2.593)	5.199** (-2.579)
Central Asia++			-1.315 -4.714	-0.260 -4.944
East Asia & Pacific			1.972 (-7.008)	3.784 (-7.457)
Western Europe			4.620 (-2.970)	4.275 (-2.997)
Americas			-0.504 (-6.687)	1.820 (-7.480)
Shanghai Middle Group			-4.020* (-2.219)	-4.020* (-2.206)
Shanghai Top Group			-2.161 (-3.082)	-1.926 (-3.082)
Constant	4.860** (-2.066)	5.727*** (-2.128)	3.398 (-5.068)	0.705 (-6.411)
Observations	387	387	387	387
Number of countries	39	39	39	39
R² Within	0.008	0.059	0.109	0.010
R² Between	0.001	0.038	0.470	0.478
R² Overall	0.000	0.036	0.441	0.450
Chi²	1.24	13.04**	49.12***	50.37***

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; + Demeaned variables are included in all models, but not reported; ++ Reference category is *Eastern Europe*.

method is a random-effects GLS regression. In order to reproduce fixed-effects coefficient estimates of the time-variant variables (and thus controlling for the fraction of the unobserved heterogeneity that is correlated with those variables), demeaned versions of

the variables are included in the random-effects model (for detailed discussions, see Allison 2009 or Gießelmann and Windzio 2012).

Formally, the regression equation can thus be described as:

$$y_{it} = \beta_1 * x_{it} + \beta_2 * \bar{x} + \beta_3 * z_i + w_{it}$$

In addition to unobserved heterogeneity, TSCS models are also often plagued by serial correlation of their residuals. This is true for our data as well. More specifically, we find autocorrelation of the first order (AR1) in all of our models. We correct for these disturbances following Baltagi and Wu (1999).¹⁴

In *Table 4*, our hybrid regression estimates for inbound mobility ratios are reported. In Model 1, the only predictor is the dummy variable indicating Bologna membership. It fails to exert a significant relationship, suggesting that participating in the BP does not attract international students.

When including length of membership, the number of years a country has been a member of the Bologna Process is significantly correlated with higher inbound mobility ratios. This effect, however, vanishes as soon as we estimate our full model. Taking into account variables previously identified to shape student mobility flows reveals membership in the Bologna Process does not impact on inbound mobility whatsoever. Rather, our models yield that the driving factors of inbound mobility ratios are GDP per-capita and whether the official language in a country is English. As hypothesized, both of these factors exert a positive influence on the dependent variable. These findings are robust in light of regional dummies, all of which fail to reach significance. Similarly, the size of the higher education sector – as measured by *Enrolment* – is not a significant predictor of inbound mobility ratios. Paradoxically, countries that on average have at least one but not more than six universities ranked in the top 500 of the Shanghai Ranking display significantly (at the $p < 0.1$ level).

While in terms of inbound mobility the Bologna Process did not have an impact, the story is quite different for outbound mobility ratios. As shown in *Table 5*, the coefficient for membership in the BP is consistently significant and positive across all models. In other words, once a country joins the Bologna Process, it sees its outbound mobility ratio increase by more than 1.3 points, *ceteris paribus*. This effect is quite substantial since the dependent variable has a mean of only 3.7.

In sum, we find no evidence for an impact of the Bologna Process on inbound mobility ratios, but a robustly positive relationship with membership and outbound mobility. While official BP documents are vague in specifying what type of mobility should increase, the notion of a highly competitive Europe of knowledge would suggest that pol-

¹⁴ This method is also robust for estimating regression coefficients with unbalanced and unevenly spaced underlying data, as it is the case with ours.

Table 5: Hybrid regression estimates for outbound mobility ratios +

VARIABLES	Model 5	Model 6	Model 7	Model 8
Bologna member	1.302*** (0.383)	1.341*** (0.386)	1.411*** (0.388)	1.345*** (0.389)
Length of membership		-0.0140 (0.0326)		0.0766* (0.0445)
GDP per capita			-5.06e-05** (2.53e-05)	-8.58e-05*** (3.25e-05)
Enrolment			-5.21e-07 (7.62e-07)	-7.09e-07 (7.68e-07)
English			-0.0439 (1.637)	-0.130 (1.468)
Central Asia ++			-4.181** (2.073)	-4.528** (1.863)
East Asia& Pacific			-3.005 (3.466)	-3.021 (3.109)
Western Europe			2.358 (2.046)	1.104 (1.869)
Americas			-5.456* (3.103)	-3491 (2.836)
Shanghai Middle Group			-3.122* (1.634)	-2.642* (1.471)
Shanghai Top Group			-5.002** (2.266)	-4.138** (2.045)
Constant	3.558*** (1.074)	2.379** (1.001)	10.780*** (2.126)	6.827*** (2.201)
Observations	382	382	382	382
Number of countries	39	39	39	39
R² Within	0.045	0.055	0.082	0.077
R² Between	0.004	0.262	0.376	0.525
R² Overall	0.019	0.145	0.303	0.391
Chi²	11.77**	27.3***	44.12***	66.08***

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; + Demeaned variables are included in all models, but not reported; ++ Reference category is *Eastern Europe*.

icy-makers were primarily interested in growing inbound mobility. Rather, the propensity to study in a HE system outside of the country of origin seems to have been fostered by the Bologna Process. It is unclear whether this could be qualified as a programmatic policy success. On the one hand, the BP is explicit in stating that increasing outbound

mobility is desirable so long as it occurs within the EHEA. On the other hand, the analysis above does not take into account destination countries for outbound flows. This is done, however, in the following dyadic analysis of country-pairs.

5.2 Dyadic analyses

This part of our analyses rests on a comparison of country pairs, so called *dyads* (see Volden 2006; Holzinger 2006; Holzinger, Knill and Sommerer 2008; Boehmke 2009). In general, the dyadic approach allows scholars to study exchange patterns directly between all pairs of states. It has been widely used in the international relations literature (e.g. Gartzke 2007), where often the dependent variable does not measure attributes of countries but rather of pairs of countries: “The advantage of the dyadic approach is that observable relationships of theoretical interest, such as geographic proximity or similarities in socio-economic structures, can be included easily into the analysis” (Gilardi and Fuglister 2008:418). The pair approach can “more accurately measure peer relationship between each pair of states” (Boehmke 2009:1125). In the directed approach, each state can function as potential “receiver” and “sender” whereby independent variables capture the characteristics of both “receivers” and “senders”, as well as their relationships. These models have the following general form:

$$y_{ijt} = \alpha + x_{ijt}\beta + \varepsilon_{ijt}$$

where i , j , and t indexes are, respectively, “receivers”, “senders”, and time, y_{ijt} is a vector of relational outcomes, x_{ijt} is a matrix of measures for the characteristics of the dyad, and β is a vector of coefficients to be estimated (Gilardi and Fuglister 2008:416). The drawback of this approach is that observations are not only non-independent within the same dyad, but also across all dyads sharing the same state.

The data used for the construction of our dependent variables was gathered by referring to the UIS online database. It is non-aggregated micro data, counting every student seeking a degree abroad. We collected data for the period 2000 to 2010 and analyzed it cross-sectionally (in 2000, 2003, 2006 and 2009); thus, information for the remaining periods could be used to impute missing data for the observed time points. The indicator we call *received* accounts for the number of students of a sending country studying in a receiving country. These numbers are then used to code the variables *relevance* and *relv* (see below). Data accounting for the amount of students exchanged between two countries (*diffexch*) consists of a direct comparison of number of students exchanged between two countries. These values were then divided by the total amount of internationally mobile students of both countries constituting a dyad, resulting in the variable *balanced*. Due to this non-directed coding, our sample for the calculation of the degree of balance in the exchange relationships contains only 820 country pairs.

The variable *relevance* measures the magnitude of cross-national exchanges. It takes the number of students one country receives from another and divides it by the number of outbound mobile students of the sending country. We thus calculate which fraction of outbound mobile students of one country choose one specific country as study destination. Hence *relevance* is defined as the extent to which one study destination is preferred over other destinations. The other variable accounting for the magnitude of the exchanges, called *relv*, controls for the size of the higher education sector of the sending country by dividing the received student by enrolment figures (ISCED level 5A and 6) of the sending country.

5.2.1 Independent Variables

On part of the independent variables, information on *membership status in the Bologna Process* was gathered referring to the process' official documents; *membership in the EU* was determined with reference to the official website of the EU. The coding of membership status led to the formation of three sub-samples: the group of non-member countries (=0), used as reference category in the analyses; a group called mixed-dyads (=1), where one country is a Bologna EU member and the other is not; and common membership in the BP/ EU, coded (=2).

Information on *stage of implementation of ECTS* or a comparable system was gathered by means of the Stocktaking as well as the National Reports of the Bologna Process, by reference to secondary academic literature (Westerheijden et al 2010; Knill, Voegtle and Dobbins 2012) and extensive document analysis of national higher education regulations. The reference category was the yellow category of the 2005 Stocktaking Report scorecard, which indicates whether a “national system for credit transfer and accumulation is in place, which is compatible with ECTS, OR The national credit transfer and accumulation system is being gradually integrated with ECTS” (ibid 2005:21). The logic for coding the stage of implementation of ECTS in the dyadic approach follows the same as for Bologna and EU membership.

Additionally, we include information about *study program structures* in the analyses. However, there is no single model of both first and second-cycle programs for Bologna Process participants: “the 180+120 ECTS credits ("3+2") model is [therefore] the most widespread, but a number of other combinations are also present in the EHEA” (Eurydice 2012:35). Thus, we do not refer to compatibility in format but to the percentage of students enrolled in any kind of two-cycle degree system to assess the extent to which this policy is implemented. To do so, we referred to Stocktaking and National Reports of the Bologna Process as well as OECD Education at a Glance reports. We used the scorecard of the Stocktaking Reports as benchmarks, level of student enrolment, light green and up, from 2009 on yellow and up, as reference category, thus if “51-80 [or

more] of students are enrolled in the two-cycle system” (ibid 19) respectively if “50-69 [or more] of all students are enrolled in a two-cycle degree system that is in accordance with the Bologna principles” (Stocktaking Report 2009:31). Dyads with approximately the same level of student enrolment in two-tier degree systems were coded with 1, otherwise with 0. We did not evaluate if common adoption and implementation of a Diploma Supplement influenced exchange relationships between the countries of our sample since recent studies (e.g. Knill, Voegtle and Dobbins 2012) have shown that the Diploma Supplement has so far only been introduced by Bologna participants. Thus, including the stage of implementation of Diploma Supplement in our analysis would cause problems of collinearity with membership status in the Bologna Process.

Besides assessing the effects of common higher education policies, we include factors mentioned in the literature (see section 3) as impacting cross-national student migration. As aforementioned in the discussion on student mobility literature (see section 3), *language commonalities*, *geographical proximity* and economic performance – measured in GDP per-capita – impact cross-national student exchange patterns. To assess language commonalities, we refer to common official language(s) used (=1); otherwise (=0), as indicated in the CIA World Fact Book. Common borders were coded with reference to the online resource, NationMaster; the coding scheme resembles the one for common official language. Data on GDP per-capita was taken from UIS online resources, and similarity was assessed by calculating the *absolute distance in GDP per-capita* between two countries forming a dyad.

5.2.2 Descriptive analyses

Before investigating cross-national student mobility ties, we control for the probability distribution of the dependent variables. As we can refer from *Figure A* in Annex B, the values for the difference in exchanged students (*diffexch*) – the baseline for calculating the variable *balance* – are stable over time. Further we detect a highly right-skewed distribution; hence there are a lot of zeros, mostly very small values and some very large values. Due to the highly right skewed distribution of the dependent variable, relying on the mean in our descriptive analysis would be misleading. Hence, we compare the results for the median, mean, and variance and look at the maximum values of the variables as well as control for group effects resulting from different membership status in the Bologna Process and in the EU. Thereby, the group of the non-members serves as a reference group. In general, the smaller the median and mean values, the more balanced the exchange relationships between the countries. *Table 6* displays the results of the descriptive analyses on the degree of (im)balance. The most imbalanced student exchange patterns can be found between non-BP members and has risen remarkably since 2006, irrespectively if referring to the mean or median values.

Table 6: Degree of (im)balance in cross-national student exchange patterns depicted by sub-groups

Membership in BP	N	Median	Mean	Variance	Max	EU-membership	N	Median	Mean	Variance	Max
2000						2000					
Non-members	120	.03	2.28	51.91	42.58	Non-members	378	.04	1.16	19.93	42.58
Mixed-dyads	400	.07	.73	4.93	25.82	Mixed-dyads	364	.16	.93	5.17	25.82
Bologna-members	300	.28	1.45	10.54	31.67	EU-members	78	.58	2.86	24.87	31.67
2003						2003					
Non-members	55	.04	3.09	73.51	39.81	Non-members	378	.04	1.17	19.75	39.81
Mixed-dyads	329	.06	.75	5.40	27.10	Mixed-dyads	364	.23	1.04	5.09	23.49
Bologna-members	436	.27	1.39	10.59	32.31	EU-members	78	.64	2.55	15.32	21.55
2006						2006					
Non-members	28	.76	4.91	106.45	39.04	Non-members	172	.09	1.54	25.31	39.04
Mixed-dyads	264	.07	.70	4.20	22.99	Mixed-dyads	417	.12	.76	2.69	12.60
Bologna-members	528	.21	1.32	14.43	48.74	EU-members	231	.30	1.89	27.76	48.74
2009						2009					
Non-members	28	1.49	5.13	94.19	41.38	Non-members	138	.13	1.74	29.22	41.38
Mixed-dyads	264	.08	.70	4.65	27.39	Mixed-dyads	406	.14	.74	2.29	9.12
Bologna-members	528	.23	1.39	13.87	43.33	EU-members	276	.31	1.89	23.29	43.33

Looking at the values for the median, the group of BP-members displays the highest imbalance from 2000 until 2003. However, there is no significant increase in mean values over the period of investigation; thus the imbalances between members of this group do not increase even though the number of participants of the Bologna Process has increased starkly. This might be due to the fact that this group contains countries with the most balanced rates between inbound and outbound mobility flows – namely Belgium, Finland, France, Germany, Italy, Norway, Poland, Romania, Slovenia, Spain, Sweden, and Turkey – as reported in the latest Stocktaking Report (see Eurydice 2012:161). Regarding the values for the variance, we can see that it largely, and increasingly, exceeds the mean values in all three groups but most remarkably in the group of non-BP members. The most balanced exchanged patterns can be found in the group of the mixed-dyads, as reflected by all measures presented in *Table 6*. During our period of investigation, 12 countries joined the EU, and thus, we have to control for group effects related to membership as well as accession to the EU. In 2000, the highest median imbalance can be found in the group of EU-members; however, with an increase in members from 2006 onwards, the imbalance reduces. Hence, with the accession of new members to the EU, the imbalance in student exchange relationships decreases, whereas the imbalance between non-EU members increases.

As has been the case with *balanced*, before analyzing the magnitude of cross-national student exchanges, we controlled for the probability distribution of the dependent variable *relevance*. As we can infer from *Figure B* in Annex B, the variable accounting for the relevance of the student exchange relationship has a highly right-skewed distribution. In general, high median and mean values indicate high relevancy for the respective exchange relationship. As we can infer from *Table 7*, the countries with the most relevant student exchange relationships in 2000 belong to the group of Bologna participants (see their median values). However, the higher mean in the group of non-member indicates that the most extreme values for relevance can be found in this group. *Table 7* also depicts the results for EU membership status; both the median and the mean are highest in the group of EU-members in the beginning of the period of investigation before decreasing drastically in the following periods. Concurrently, the median and mean values for the group of the non-members have increased. In accordance with the results depicted in *Table 6*, the group of non-BP members contains the most relevant as well as the most imbalanced exchange relationships. This leads us to conclude that the strongest exchange relationship have existed, and are still present, between Western-European countries being both long-time EU members as well as founding participants to the Bologna Process. Moreover, membership in the Bologna Process leads to slightly more balanced student exchanges, since the most imbalanced relationships are not found within the group of participants (see *Table 6*).

Table 7: Relevance of dyadic student exchange relationships depicted by sub-groups

Membership in BP	N	Median	Mean	Variance	Max	EU-membership	N	Median	Mean	Variance	Max
2000						2000					
Non-members	240	.02	3.48	141.77	76.60	Non-members	756	.03	2.01	68.80	76.59
Mixed-dyads	600	.04	1.50	32.81	69.09	Mixed-dyads	727	.13	1.95	30.45	55.29
Bologna-members	800	.37	3.14	54.37	80.54	EU-members	157	1.22	6.24	110.90	80.54
2003						2003					
Non-members	110	.08	4.53	184.90	71.97	Non-members	756	.03	1.88	59.67	72.42
Mixed-dyads	659	.06	1.60	31.86	72.41	Mixed-dyads	727	.18	2.22	45.59	76.92
Bologna-members	871	.22	2.80	62.36	77.20	EU-members	157	1.35	6.08	102.08	77.20
2006						2006					
Non-members	56	1.08	8.02	274.03	67.81	Non-members	343	.08	2.86	91.71	67.81
Mixed-dyads	530	.10	1.58	24.36	67.00	Mixed-dyads	835	.10	1.59	20.74	47.60
Bologna-members	1054	.20	2.53	52.16	84.52	EU-members	462	.50	3.56	76.21	84.52
2009						2009					
Non-members	56	1.35	8.18	266.41	63.99	Non-members	274	.11	3.05	101.03	69.29
Mixed-dyads	530	.11	1.46	22.31	69.29	Mixed-dyads	814	.12	1.55	17.73	40.93
Bologna-members	1054	.26	2.58	51.73	84.22	EU-members	552	.46	3.35	72.79	84.22

5.2.3 *Multilevel analyses of determinants of cross-national student exchanges*

The dependent variables of our study can be regarded as count data since they account for 1) the absolute number of degree-seeking students going from one country to another and 2) the absolute difference in students exchange between two countries. Since our count data is over-dispersed (when the conditional variance exceeds conditional mean, see *Tables 6 and 7*), negative binomial regression should be used for analysis. The dataset for our analysis has a macro-panel structure, since we observe a large number of units over a small number of ‘waves’. Merely pooling observations across time in addition to space is problematic, since the data has an explicit structure that should be modeled (cf. Shor et al 2007:166). Panel data can be conceived as two-level or cluster-data, where periods are nested in units, so that the units become clusters (Rabe-Hesketh and Skrondal 2008:179). Due to the dyadic coding of our data as well as the resulting lack of independence between the units of analysis, it is not advisable to conduct standard regression analysis (Rabe-Hesketh and Skrondal 2008:185), and thus, we refer to multi-level models, whereas the countries constituting the observations (dyads) are introduced as second level. We refer to multi-level Poisson regression which can be justified since the Poisson distribution can be derived from the negative binomial distribution. In Poisson regression, coefficients are interpreted as the difference between the log of expected counts, where formally, this can be written as

$$\beta = \log(\mu x + 1) - \log(\mu x),$$

where β is the regression coefficient, μ is the expected count and the subscripts represent where the predictor variable. Since the difference of two logs is equal to the log of their quotient, or

$$\log(\mu x + 1) - \log(\mu x) = \log(\mu x + 1 / \mu x),$$

we can interpret the parameter estimate as the log of the ratio of expected count or a rate. By definition a rate is the number of events per time (or space), which our response variable qualifies as. In our case, the number of events is simply the number of students from one country studying in another country in a given year. Also note that each subject in our sample was followed for the same period; if this would not be the case, our Poisson regression estimate would be biased, since our model assumes all subjects had the same follow up time.

Table 8 depicts the results of the analyses for *relevance*, *relv*, *diffexch*, and *balanced*. Let us first take a look at the results for each dependent variable separately before drawing overall conclusions. We begin with the results for *relevance*, or the amount of students of one country received by another one, controlled for the total amount of outbound mobile students of the sending country. To our surprise, taking the group of non-

Bologna participants as reference category, participation in the Bologna Process has a significantly negative impact on the magnitude of student exchanges. Pooled over the whole period of investigation, membership of one or both countries of a dyad influences the probabilities for an increase in relevance negatively. Hence, the strongest exchange ties can be found in the group of non-Bologna members. Looking at the results for EU-membership, the results can be interpreted analogously. Thus, non-EU member countries have the strongest exchange ties.

Common implementation of ECTS or a comparable system does not impact the relevance of the exchange relationship; the most relevant exchange patterns can be found among countries at different stages of implementation. In contrast, dyads in which both countries had a two-tier study system implemented to a comparable degree have the most relevant relationships. Besides structural higher education policy similarity, a common official language and geographical proximity account for the magnitude of cross-national student exchanges. A highly influential factor is geographical proximity, whereas similarity in GDP per-capita exerts a significant negative influence, although the strength of the effect is negligible. Thus, the most relevant exchange relationships are between countries with comparable GDP per-capita.

To control for varying size of the higher education sectors, we analyzed the exchanged students controlled by enrolment in the sending country, named *relv*. As can be derived from *Table 8*, the strongest ties are among the non-Bologna participants. The results for EU-membership can be interpreted analogously. Common implementation of ECTS or comparable systems exerts a strong, highly significant and positive influence. The results for common implementation of modularized program structures differ from the ones discussed before. Rather, a common degree of enrolment does not account for the magnitude of exchanges. In similar vein, a common official language does not lay ground to the most relevant student exchange relationships. The impact of geographical proximity remains positive and significant, although its effect is reduced compared to the results for *relevance*. Similarity in GDP per-capita exerts a significant negative influence, but since the strength of the effect is almost non-existent, we can conclude that the most relevant exchange relationships are between countries with similar GDP per-capita. The most surprising result is that the effect a common official language diminishes when controlling for the size of the sending countries' higher education sector.

The next dependent variable we look at is called *diffexch*, which accounts for the difference in the total amount of exchanged students between a dyad. With regard to the results depicted in *Table 8*, the exchange of students is more balanced within the group of Bologna participants, whereas the greatest imbalances can be found between EU-members and least in the group of non-members. In similar vein, if both countries of a dyad have implemented ECTS or a comparable system to a similar degree, they belong

to the group with the highest imbalance in student exchanges. However, the degree of imbalance decreases if both countries have two-cycle study systems implemented to a comparable extent and if both countries have a common official language. Bordering countries show imbalanced exchange patterns, and thus, we can assume that student migration is mostly one-directional. An increase in difference in GDP per-capita leads to a decrease in difference; hence, similarity in GDP per-capita leads to more balanced exchange patterns.

Controlling for the amount of outbound mobile students of both countries constituting a dyad (i.e. the variable named *balanced*), we find the most balanced relationships within the group of mixed Bologna dyads. The most imbalanced relationships are among the non-participants, followed by the Bologna participants. The starkest difference can be found between EU-members, although this effect is rather small. The most balanced patterns can be found in the group of countries with mixed stages of implementation of ECTS or comparable systems. A common stage of enrollment in a two-cycle study system decreases the imbalance in exchange relationships; therefore, the most balanced student exchange patterns are among countries which both have a two-cycle system in place with comparable enrolment levels. Likewise, if two countries have the same official language, their student exchange relationships are more balanced; however, this does not hold for bordering countries. Rather, common frontiers have a strong and significant impact on increasing the imbalance of exchange relationships. For commonalities in socio-economic factors, an increase in difference in GDP per-capita decreases imbalance. Thus, the more similar the countries are in their economic performance, the more balanced their student exchanges are.

Overall, the highest imbalance can be found in dyads where none of the countries participates in the Bologna Process and none of them is EU member. Moreover, the most relevant exchange relationships can be found in the group of non-Bologna members. With regard to structural similarities between higher education systems, imbalances in exchanges are smallest if both countries have approximately the same stage of implementation of a two-cycle degree system. Likewise, language similarities reduce imbalances in exchanges. If two countries have a common official language, their student exchange patterns are more balanced compared to countries with dissimilar official languages. Contrastingly, bordering countries have the most relevant, and yet most imbalanced, student exchanges. This is in line with the results of the latest Stocktaking Report, where some countries reported stark imbalances with a neighboring country that was often linked to a specific study field, for instance: “the French Community of Belgium that reports imbalanced flows of French students enrolling in paramedical or veterinary medicine, and Austria that reports a similar phenomenon in relation to German students enrolling in medicine and psychology” (Eurydice 2012:163). Increasing differ-

Table 8: Pooled Poisson multi-level model of factors impacting on dyadic student exchange patterns

VARIABLES	relevance (received/outbound)	relv (received/enrolment)	diffexch	Balanced (diffexch/outbound)
Bologna-membership				
1	-.617(.034)***	-1.589(.033)***	-1.985(.003)***	-1.269(.065)***
2	-.177(.043)***	-1.776(.039)***	-1.938(.004)***	-1.086(.085)***
EU-membership				
1	-.469(.030)***	-.732(.032)***	.485(.002)***	.104(.052)**
2	-.451(.038)***	-.892(.040)***	1.071(.003)***	.606(.069)***
ECTS				
1	-.359(.041)***	-.235(.055)***	-.249(.004)***	-.357(.082)***
2	-.258(.041)***	.800(.054)***	.707(.004)***	.200(.083)**
TC	.138(.033)***	-.241(.042)***	-.616(.003)***	-.291(.064)***
Language	.136(.027)***	-1.197(.034)***	-.660(.003)***	-.144(.061)**
Borders	1.380(.023)***	1.200(.026)***	1.412(.002)***	1.630(.047)***
GDP per capita	-.000(1.14e-06)***	-.000(1.14e-06)***	-7.18e-06(9.34e-08)***	-8.14e-06(2.19e-06)***
Constant	.608(.250)**	1.139(.324)***	6.516(.208)***	.424(.162)**
Random intercept standard deviation	1.563(.178)	2.031(.232)	1.318(.147)	.846(.103)
Log-likelihood	-14026.987	-34539.185	-2233820.100	-5223.389
N (dyads)	6560	6560	3280	3280
N (groups)	41	41	41	41
Test vs. Poisson regression	.000	.000	.000	.000

ences in GDP per-capita between the countries are influential for degree of balance since the starkest imbalances can be found between countries with large differences in GDP per-capita.

In summary, we cannot say that either similarities or opposites attract, since this is context specific. Mostly, differences in the factors investigated furthered the relevance of exchange relationship while at the same time leading to more imbalanced exchanges. Exceptions are modularized degree structures – where the most relevant exchange relationships can be found among countries with a similar degree of implementation –and language commonalities, which also positively impacts relevance.

6 COMPARATIVE DISCUSSION OF RESULTS

Returning to the question posed with reference to the heuristic of Marsh and McConell (2010), we analyzed the success of the Bologna Process with regard to degree-seeking student mobility in a comparative perspective. Overall, international student mobility has increased between 2000 and 2010, although to a much lesser extent than previous studies would suggest. Mobility into the EHEA has not increased, at least not from other OECD countries. Countries with English as their official language (with the exemption of Ireland) have the highest inbound mobility ratios. For outbound mobility ratios, however, the story is quite different. Here, we find a robust positive relationship between Bologna membership and the share of students studying outside their country of origin. In other words, once a country has joined the Bologna Process, the propensity to leave the country is elevated. This could be interpreted as a brain-drain effect, primarily affecting those countries that have underdeveloped HE systems. However, program-theoretical assumptions of the policy instruments associated with the Bologna Process clearly state that through establishing harmonized degree cycles and a system of transferable degrees, hurdles to studying in foreign countries should be lowered. While it should be worrisome to policymakers, this effect is only observable on the outbound-side of the mobility equation thus far, it is in line with (albeit vaguely stated) goals of the Bologna Process. Setting the results of the dyadic analyses in relation to the ones for inbound and outbound mobility, we can state that participant status of a country in the Bologna Process per se does not attract a higher share of international students. This respect, one would have to conclude that the Bologna Process has not reached its stated goal of increasing mobility.

In general, student exchange patterns are more balanced between countries from the same language community, and exchanges between neighboring countries are more unbalanced, indicating one-directional exchanges. Exchange relationships are most balanced if both countries of a dyad have a comparable percentage of students enrolled in a two-cycle system. Moreover, balanced student exchanges take place between countries

with similar economic performance, measured in distances in GDP per-capita. To this date, the strongest exchange relationships are still present between Western-European countries that are both long time EU members as well as founding participants of the Bologna Process, suggesting a modest to non-existent impact on (essentially Eastern-European and Eurasian) countries that joined later. These findings are in line with those of the latest Stocktaking Report, as “more than half of all incoming students from inside the EHEA choose the United Kingdom, Germany, France and Austria as their study destination” (Eurydice 2012:157). For countries such as Cyprus, Ireland, Moldova, and Slovakia, the difference between in-and outbound mobility is in favor of outbound mobility (ibid. 161).

In contrast to the literature discussed earlier, we find that the most relevant student exchanges take place between countries with similar economic performance, measured in distances in GDP per-capita. Moreover, common language impacts negatively on the extent of exchanged students, and geographical proximity is influential insofar as the importance of an exchange relationship. A common stage of implementation of ECTS or a comparable system exerts a highly positive and significant influence on the relevance of exchange relationships. In summary, the most relevant but least balanced cross-national student exchanges take place between OECD countries that are neither participating in the Bologna Process nor an EU-member. Moreover, we can detect a general tendency towards East-West imbalances, which is also reflected on a global scale, as outward mobility predominantly flows in the direction of the USA (see Eurydice 2012: 164). The difference between inbound and outbound mobility ratios suggests that it would be an interesting endeavor to include large non-European, non-OECD countries (such as China and India) into our analyses, since this might yield different conclusion regarding the impact of the Bologna Process on attracting international mobile students. For example, the 2012 Stocktaking Report states that four countries – the United Kingdom, France, Russia and Germany – attract 76% of all students from outside the EHEA (Eurydice 2012:154). Whether higher education policy reforms in the course of the Bologna Process have contributed to the attraction of these preferred study destinations, however, remains an open question.

As our findings are based on analyses of degree-seeking student mobility, we cannot determine whether the Bologna Process has had an impact on increasing short-term or credit mobility or whether the exchange relationships are more balanced in the field of short-term mobility. Unfortunately, internationally comparable data for short-term mobility is not available (see Orr, Gwosc' and Netz 2011: 170). Moreover, our finding that the Bologna Process has not furthered inbound mobility might be due to the composition of the sample, excluding non-OECD countries. In this respect, it would be especially interesting to investigate exchange patterns between OECD countries and large Asian

countries such as China and India in order to analyze whether continental Europe has been successful in attracting more students from this region, which have previously chosen the United Kingdom as the only relevant European study destination. In short, the influence of the Bologna Process on student mobility patterns is less direct than mere membership. It does have an enhancing effect on mobility, but this is due to its communicative power to further implementation processes in the field of credit transfer and accumulation systems and modularized study program structures. Since implementation efforts for these policies have been fortified not only for Bologna members but also beyond its realm of participants (see Knill, Voegtle and Dobbins 2012), we can state that the Bologna Process has brought about a global agreement on the structure of higher education programs. The Bologna Process has contributed to a global discourse on structural standards for higher education provision, and these effects are visible beyond its participants.

REFERENCES

- Argyris, Chris and Donald A. Schön. 1978. *Organizational learning: A theory of action perspective*. Reading, Mass: Addison-Wesley.
- Astbury, Brad and Frans L. Leeuw. 2010. Unpacking Black Boxes: Mechanisms and Theory Building in Evaluation: *American Journal of Evaluation*: 31(3): 363-381.
- Beine, Michael, Romain Noel and Lionel Ragot. 2011. *The determinants of international mobility of students*. CESifo Working Paper Series No. 3498.
- Bessey, Donata. 2010. International student migration to Germany. *Empirical Economics* 42:345-61.
- Berlin Communiqué. 2003. Realising the European Higher Education Area - Communiqué to the Conference of Ministers responsible for Higher Education: http://www.bmbf.de/pub/communique_bologna-berlin_2003.pdf [03.05.2013].
- Blamey, Avril and Mhairi Mackenzie. 2007. Theories of Change and Realistic Evaluation: Peas in a Pod or Apples and Oranges?: 13(4): 439-455.
- Boehmke, Frederick J. 2009. Policy Emulation or Policy Convergence? Potential Ambiguities in the Dyadic Event History Approach to State Policy Emulation: *The Journal of Politics*: 71(3): 1125-1140.
- Bologna Declaration. 1999. The Bologna Declaration of 19 June 1999 - Conference of European Ministers Responsible for Higher Education: http://www.ehea.info/Uploads/Declarations/BOLOGNA_DECLARATION1.pdf [03.05.2013].
- Bologna Follow Up Group. 2005. Stocktaking Report 2005- Bologna Process Stocktaking: <http://www.ehea.info/article-details.aspx?ArticleId=73> [01.07.2013].
- Bologna Follow Up Group. 2007. Stocktaking Report 2007- Bologna Process Stocktaking: <http://www.ehea.info/article-details.aspx?ArticleId=73> [01.07.2013].
- Bologna Follow Up Group. 2009. Stocktaking Report 2009- Bologna Process Stocktaking: <http://www.ehea.info/article-details.aspx?ArticleId=73> [01.07.2013].
- Bucharest Communiqué. 2012. Making the Most of Our Potential: Consolidating the European Higher Education Area: <http://www.ehea.info/Uploads/%281%29/Bucharest%20Communique%202012%281%29.pdf> [01.07.2013].
- CIA. 2013. World Fact Book: <https://www.cia.gov/library/publications/the-world-factbook/> [01.07.2013].
- Charlier, Jean-Emile. 2008. Assessing Europe's Initiatives to Boost the Competitive Position of Its Higher Education: *European Education*: 40(1): 107-109.
- Chen, Huey-Tsyh. 1990. *Theory-driven evaluations*: Newbury Park, CA: Sage.
- Dreher, Axel, and Panu Poutvaara. 2005. *Student flows and migration: an empirical analysis*. CESifo working papers, No. 1490.
- Dwyer, Mary M, and Courtney K Peters. 2004. The benefits of study abroad. *Transitions Abroad* 37 (5):56-8.
- Eurostat. 2009. *The Bologna Process in Higher Education in Europe: Key indicators on the social dimension and mobility*. European Commission.

- Executive Agency Education, Audiovisual and Culture (Eurydice). 2012. *The European higher education area in 2012: Bologna process implementation report*. Brussels: Education, Audiovisual and Culture Executive Agency [a.o.].
- Friedman, Victor J. 2001. Designed Blindness: An Action Science Perspective on Program Theory Evaluation: *American Journal of Evaluation*: 22(2): 161-181.
- Gilardi, Fabrizio and Katharina Füglistner. 2008. Empirical Modeling of Policy Diffusion in Federal States: The Dyadic Approach: *Swiss Political Science Review*: 14(3): 413-450.
- Hoareau, Cécile. 2011. Deliberative governance in the European Higher Education Area. The Bologna Process as a case of alternative governance architecture in Europe: *Journal of European Public Policy*: 19(4): 530-548.
- Holzinger, Katharina. 2006. Methodological Pitfalls of Convergence Analysis: *European Union Politics*: 7(2): 271.
- Holzinger, Katharina, Christoph Knill and Thomas Sommerer. 2008. Environmental Policy Convergence: The Impact of International Harmonization, Transnational Communication and Regulatory Competition: *International Organization*: 62 553-587.
- Kehm, Barbara M., and Ulrich Teichler. 2007. Research on Internationalisation in Higher Education. *Journal of Studies in International Education* 11 (3-4):260-73.
- Knill, Christoph, and Jale Tosun. 2012. *Public Policy: A New Introduction*. Basingstoke: Palgrave Macmillan.
- Knill, Christoph, Eva Maria Voegtler and Michael Dobbins. 2012. *Hochschulpolitische Reformen im Zuge des Bologna-Prozesses: Eine vergleichende Analyse von Konvergenzdynamiken im OECD-Raum*. Wiesbaden: VS Verlag.
- Lee, Chang Kil and David Strang. 2006. The International Diffusion of Public Sector Downsizing: Network Emulation and Theory Driven Learning: *International Organization*: 60(4): 883-909.
- Leuven Communiqué. 2009. The Bologna Process 2020 - The European Higher Education Area in the new decade: http://www.ehea.info/Uploads/Documents/Leuven_Louvain-la-Neuve_Communique%C3%A9_April_2009.pdf [01.07.2013].
- Marsh, David and Allan McConnell. 2010. Towards a framework for establishing policy success: *Public Administration*: 88(2): 564-583.
- NationMaster. 2013. World Statistics, Country Comparisons: <http://www.nationmaster.com/index.php> [01.07.2013].
- OECD. 2000-2013. Education at a Glance: http://www.oecd-ilibrary.org/education/education-at-a-glance_19991487 [01.07.2013].
- Olsen, Johan P. and Peter Maassen. 2007. *European Debates on the Knowledge Institution - The Modernization of the Universities at the European Level*: in Maassen, Peter and Johan P. Olsen: University Dynamics and European Integration. Dordrecht: Springer. 3-22.
- Orr, Dominic, Christoph Gwosdz and Nicolai Netz. 2011. *Social and Economic Conditions of Student Life in Europe*. Synopsis of indicators. Final report. Eurostudent IV 2008-2011. Bielefeld: W. Bertelsmann

- Papatsiba, Vassiliki. 2006. Making Higher Education More European through Student Mobility? Revisiting EU Initiatives in the Context of the Bologna Process. *Comparative Education* 42 (1):93-111.
- Rabe-Hesketh, Sophia and Anders Skrondal. 2008. *Multilevel and longitudinal modeling using stata*: College Station, Tex: Stata Press.
- Rosenzweig, Mark R. 2006. *Global Wage Differences and International Student Flows*. Brookings Trade Forum
- . 2007. *Higher Education and International Migration in Asia: Brain Circulation*. Regional Bank Conference on Development Economics - Beijing.
- Shor, Boris, Joseph Bafumi, Luke Keele et al. 2007. A Bayesian Multilevel Modeling Approach to Time-Series Cross-Sectional Data: *Political Analysis*: 15 165-181.
- Spilimbergo, Antonio. 2007. *Democracy and Foreign Education*. IMF Working Papers 07/51, International Monetary Fund.
- Tilley, Nick. 2004. Applying theory-driven evaluation to the British Crime Reduction Programme: *Criminal Justice*: 4:255-276.
- Tomusk, Voldemar. 2007. *Pizza Bolognese à la Russe: The Promise and Peril of the Bologna Process in Russia*: in Tomusk, Voldemar: *Creating the European Area of Higher Education: Voices from the Periphery*. Dordrecht: Springer.
- Tremblay, Karine. 2001. *Student Mobility between and towards OECD countries: A comparative analysis*. OECD Trends in International Migration (Annual Report).
- UNESCO Lisbon Recognition Convention. 1997. Convention on the Recognition of Qualifications concerning Higher Education in the European Region: http://portal.unesco.org/en/ev.php-URL_ID=13522&URL_DO=DO_TOPIC&URL_SECTION=201.html [03.05.2013].
- UNESCO Institute for Statistics. 2013. UIS online database: <http://www.uis.unesco.org/Pages/default.aspx> [01.07.2013].
- Van Damme, Dirk. 2009. *The Search for Transparency: Convergence and Diversity in the Bologna Process*: in van Vught, Frans A.: *Mapping the Higher Education Landscape*. Dordrecht: Springer: 39-56.
- Volden, Craig. 2006. States as Policy Laboratories: Emulating Success in the Children's Health Insurance Program: *American Journal of Political Science*: 50(2): 294-312.
- Westerheijden, D. F., E. Beerkens, L. Remonini et al. 2010. *The first decade of working on the European Higher Education Area. Bologna process independent assessment volume 1: Main report*. Enschede: CHEPS.
- Zgaga, Pavel. 2006. Looking out: The Bologna Process in a Global Setting. On the 'External Dimension' of the Bologna Process: http://www.madrid.org/cees/acap/historia/Bologna_Global_final_report.pdf [03.05.2013].
- Zhao, Miao and Danny Wildemeersch. 2008. Hosting Foreign Students in European Universities International and Intercultural Perspectives: Establishing the European area of higher education through the Bologna process. *European Education*: 40(1): 51-62.

ANNEX A

Table A: Student mobility issues mentioned in official documents accompanying the Bologna Process

Document	Statements on student mobility	Measurable targets
1998 Sorbonne Declaration	<p>Nowadays, too many of our students still graduate without having had the benefit of a study period outside of national boundaries.</p> <p>An open European area for higher learning carries a wealth of positive perspectives, of course respecting our diversities, but requires on the other hand continuous efforts to remove barriers and to develop a framework for teaching and learning, which would enhance mobility and an ever closer co-operation.</p> <p>At both undergraduate and graduate level, students would be encouraged to spend at least one semester in universities outside their own country. At the same time, more teaching and research staff should be working in European countries other than their own. The fast growing support of the European Union, for the mobility of students and teachers should be employed to the full.</p> <p>We hereby commit ourselves to encouraging a common frame of reference, aimed at improving external recognition and facilitating student mobility as well as employability.</p>	
1999 Bologna Declaration	<p>It [the Sorbonne Declaration] emphasised the creation of the European area of higher education as a key way to promote citizens' mobility and employability and the Continent's overall development.</p> <p>We must in particular look at the objective of increasing the international competitiveness of the European system of higher education. The vitality and efficiency of any civilisation can be measured by the appeal that its culture has for other countries. We need to ensure that the European higher education system acquires a world-wide degree of attraction equal to our extraordinary cultural and scientific traditions.</p> <p>Establishment of a system of credits - such as in the ECTS system - as a proper means of promoting the most widespread student mobility.</p> <p>Promotion of mobility by overcoming obstacles to the effective exercise of free movement with particular attention to: for students, access to study and training opportunities and to related services</p>	

Document	Statements on student mobility	Measurable targets
2001 Prague Communiqué	<p>Ministers reaffirmed that efforts to promote mobility must be continued to enable students, teachers, researchers and administrative staff to benefit from the richness of the European Higher Education Area including its democratic values, diversity of cultures and languages and the diversity of the higher education systems.</p> <p>Ministers reaffirmed that the objective of improving the mobility of students, teachers, researchers and administrative staff as set out in the Bologna Declaration is of the utmost importance. Therefore, they confirmed their commitment to pursue the removal of all obstacles to the free movement of students, teachers, researchers and administrative staff and emphasized the social dimension of mobility. They took note of the possibilities for mobility offered by the European Community programmes and the progress achieved in this field, e.g. in launching the Mobility Action Plan endorsed by the European Council in Nice in 2000.</p> <p>Ministers agreed on the importance of enhancing attractiveness of European higher education to students from Europe and other parts of the world.</p> <p>They [Ministers] emphasise that in international academic cooperation and exchanges, academic values should prevail.</p> <p>Mobility of students and academic and administrative staff is the basis for establishing a European Higher Education Area. Ministers emphasise its importance for academic and cultural as well as political, social and economic spheres. They note with satisfaction that since their last meeting, mobility figures have increased, thanks also to the substantial support of the European Union programmes, and agree to undertake the necessary steps to improve the quality and coverage of statistical data on student mobility.</p>	
2003 Berlin Communiqué	<p>They reaffirm their intention to make every effort to remove all obstacles to mobility within the European Higher Education Area. With a view to promoting student mobility, Ministers will take the necessary steps to enable the portability of national loans and grants.</p> <p>Moreover, they stress the necessity of ensuring a substantial period of study abroad in joint degree programmes as well as proper provision for linguistic diversity and language learning, so that students may achieve their full potential for European identity, citizenship and employability.</p>	
2005 Bergen Communiqué	<p>We recognise that mobility of students and staff among all participating countries remains one of the key objectives of the Bologna Process. Aware of the many remaining challenges to be overcome, we reconfirm our commitment to facilitate the portability of grants and loans where appropriate through joint action, with a view to making mobility within the EHEA a reality. We shall intensify our efforts to lift obstacles to mobility by facilitating the delivery of visa and work permits and by encouraging participation in mobility programmes. We urge institutions and students to make full use of mobility programmes, advocating full recognition of study periods abroad within such programmes.</p> <p>We also charge the Follow-up Group with presenting comparable data on the mobility of staff and students as well as on the social and economic situation of students in participating countries as a basis for future stocktaking and reporting in time for the next Ministerial Conference.</p>	

Document	Statements on student mobility	Measurable targets
2007 London Communiqué	<p>Mobility of staff, students and graduates is one of the core elements of the Bologna Process, creating opportunities for personal growth, developing international cooperation between individuals and institutions, enhancing the quality of higher education and research, and giving substance to the European dimension.</p> <p>Some progress has been made since 1999, but many challenges remain. Among the obstacles to mobility, issues relating to immigration, recognition, insufficient financial incentives and inflexible pension arrangements feature prominently. We recognise the responsibility of individual Governments to facilitate the delivery of visas, residence and work permits, as appropriate. Where these measures are outside our competence as Ministers for Higher Education, we undertake to work within our respective Governments for decisive progress in this area. At national level, we will work to implement fully the agreed recognition tools and procedures and consider ways of further incentivising mobility for both staff and students. This includes encouraging a significant increase in the number of joint programmes and the creation of flexible curricula, as well as urging our institutions to take greater responsibility for staff and student mobility, more equitably balanced between countries across the EHEA-</p> <p>Qualifications frameworks are important instruments in achieving comparability and transparency within the EHEA and facilitating the movement of learners within, as well as between, higher education systems.</p> <p>We emphasise that qualification frameworks should be designed so as to encourage greater mobility of students and teachers and improve employability.</p> <p>In our national reports for 2009, we will report on action taken at national level to promote the mobility of students and staff, including measures for future evaluation. We also agree to set up a network of national experts to share information, and help to identify and overcome obstacles to the portability of grants and loans.</p> <p>We recognise the need to improve the availability of data on both mobility and the social dimension across all the countries participating in the Bologna Process. We therefore ask the European Commission (Eurostat), in conjunction with Eurostudent, to develop comparable and reliable indicators and data to measure progress towards the overall objective for the social dimension and student and staff mobility in all Bologna countries. Data in this field should cover participative equity in higher education as well as employability for graduates. This task should be carried out in conjunction with BFUG and a report should be submitted to our 2009 Ministerial conference.</p> <p>We ask BFUG to continue the stocktaking process, based on national reports, in time for our 2009 Ministerial conference. We expect further development of the qualitative analysis in stocktaking, particularly in relation to mobility, the Bologna Process in a global context and the social dimension.</p>	

Document	Statements on student mobility	Measurable targets
2009 Leuven/Louvain-la-Neuve Communiqué	<p>The Bologna Process is leading to greater compatibility and comparability of the systems of higher education and is making it easier for learners to be mobile and for institutions to attract students and scholars from other continents.</p> <p>We believe that mobility of students, early stage researchers and staff enhances the quality of programmes and excellence in research; it strengthens the academic and cultural internationalization of European higher education. Mobility is important for personal development and employability, it fosters respect for diversity and a capacity to deal with other cultures. It encourages linguistic pluralism, thus underpinning the multilingual tradition of the European Higher Education Area and it increases cooperation and competition between higher education institutions. Therefore, mobility shall be the hallmark of the European Higher Education Area. We call upon each country to increase mobility, to ensure its high quality and to diversify its types and scope. In 2020, at least 20% of those graduating in the European Higher Education Area should have had a study or training period abroad.</p> <p>Within each of the three cycles, opportunities for mobility shall be created in the structure of degree programmes. Joint degrees and programmes as well as mobility windows shall become more common practice. Moreover, mobility policies shall be based on a range of practical measures pertaining to the funding of mobility, recognition, available infrastructure, visa and work permit regulations. Flexible study paths and active information policies, full recognition of study achievements, study support and the full portability of grants and loans are necessary requirements.</p> <p>and we aim for an improved participation rate from diverse student groups.</p>	<p>In 2020, at least 20% of those graduating in the European Higher Education Area should have had a study or training period abroad.</p> <p>Mobility should also lead to a more balanced flow of incoming and outgoing students across the European Higher Education Area</p>
2010 Budapest-Vienna Declaration	<p>In close cooperation with higher education institutions, staff, students and other stakeholders, we will step up our efforts to accomplish the reforms already underway to enable students and staff to be mobile, to improve teaching and learning in higher education institutions, to enhance graduate employability, and to provide quality higher education for all.</p>	

Document	Statements on student mobility	Measurable targets
2012 Bucharest Declaration	<p>We will pursue the following goals: to provide quality higher education for all, to enhance graduates' employability and to strengthen mobility as a means for better learning.</p> <p>Learning mobility is essential to ensure the quality of higher education, enhance students' employability and expand cross-border collaboration within the EHEA and beyond. We adopt the strategy "Mobility for Better Learning" as an addendum, including its mobility target, as an integral part of our efforts to promote an element of internationalisation in all of higher education.</p> <p>Sufficient financial support to students is essential in ensuring equal access and mobility opportunities. We reiterate our commitment to full portability of national grants and loans across the EHEA and call on the European Union to underpin this endeavour through its policies.</p> <p>We welcome the improved quality of data and information on higher education. We ask for more targeted data collection and referencing against common indicators, particularly on employability, the social dimension, lifelong learning, internationalisation, portability of grants/loans, and student and staff mobility. We ask Eurostat, Eurydice and Eurostudent to monitor the implementation of the reforms and to report back in 2015.</p>	<p>We strive for open higher education systems and better balanced mobility in the EHEA. If mobility imbalances between EHEA countries are deemed unsustainable by at least one party, we encourage the countries involved to jointly seek a solution, in line with the EHEA Mobility Strategy.</p> <p>Having outlined the main EHEA goals in the coming years, we set out the following priorities for action by 2015.</p> <p><i>At the national level, together with the relevant stakeholders, and especially with higher education institutions, we will:</i></p> <p>Implement the recommendations of the strategy "Mobility for better learning" and work towards full portability of national grants and loans across the EHEA;</p> <p><i>At the European level, in preparation of the Ministerial Conference in 2015 and together with relevant stakeholders, we will:</i></p> <p>Ask Eurostat, Eurydice and Eurostudent to monitor progress in the implementation of the Bologna Process reforms and the strategy "Mobility for better learning"</p>

ANNEX B

Table A: Graphical depiction of the distribution of variable *diffexch*

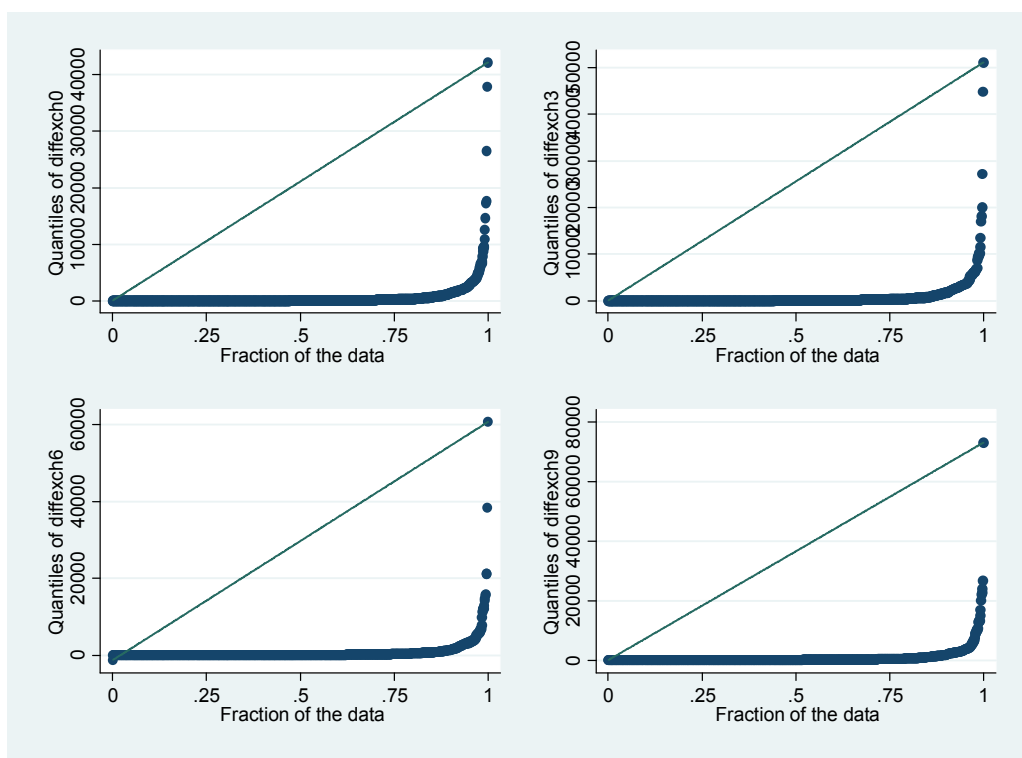
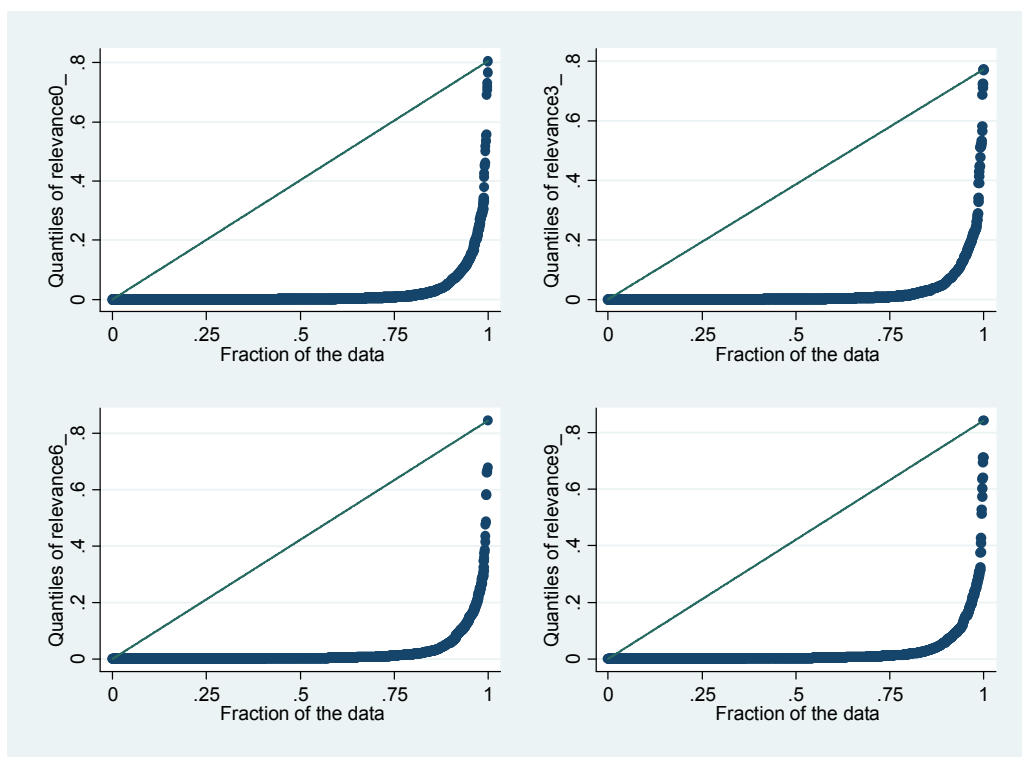


Table B: Graphical depiction of the distribution of variable *relevance*



BIOGRAPHICAL NOTE

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