

# TRANSNATIONAL HIGHER EDUCATION AND INTERNATIONAL STUDENT MOBILITY: DETERMINANTS AND LINKAGE

A panel data analysis of enrolment in Australian higher education

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Transnational higher education (TNHE) is one of the most important, even if often neglected, aspects in the internationalisation of higher education. TNHE constitutes a strategy for universities to expand recruitment. Nonetheless, it is often argued that TNHE could constitute a way for the countries where it is implemented to retain their students and to become themselves destinations for students from abroad. Numerous questions about TNHE's potential to substitute traditional international student mobility currently feed the debate among scholars and stakeholders. The scarcity of data makes it difficult to answer these questions. This paper offers a macro level panel data analysis of enrolment in Australian higher education within Australia, i.e. onshore, and abroad, i.e. offshore. Two goals are pursued: first, to investigate whether and to what extent the macro determinants of traditional student mobility, as identified by the previous research, are also related to offshore enrolment and second, to examine the relation between the two phenomena in order to assess whether they could be considered substitutes. The results indicate that the macro factors which influence onshore enrolment are also related to offshore enrolment, even if some of these relations occur in different ways and with different strengths. Studying abroad seems to be connected particularly with the lack of labour market opportunities in the home country. No substitutive linkage is found between offshore and onshore enrolment, seeming to confirm, as hypothesised by the previous research, that the two types of enrolment are absorbing different segments of international students.

**Keywords:** Transnational higher education; international student mobility; substitutability between TNHE and student mobility; Australian higher education; internationalisation of higher education.



# 1. Introduction

One of the most remarkable internationalisation trends in higher education over the last few decades has been the spread of transnational higher education (TNHE). TNHE denotes any educational activity in which “the students are in a different country to that in which the institution providing the education is based” (GATE, 1997: 1). Through TNHE, students enrol “offshore” without having to move to the country of the education provider.

The shift to a ‘trade rationale’ in the higher education sector in the nineties, attested by, for example, the negotiations of the General Agreement on Trade in Services (GATS), led many universities to expand their activities across national borders in their search for new markets. Often these new markets are found in developing countries, where public spending on primary education and literacy had been greater than that on more advanced education (Altbach, 2009; Naidoo, 2011; Verger, 2010), and where for quite some time the growing demand for higher education has pushed students to seek foreign education overseas (Shields and Edwards, 2010). TNHE is thus viewed by universities as a way to enlarge recruitment (McBurnie and Ziguras, 2007). However, for governments opening their educational market to foreign providers, TNHE is often seen as a way to satisfy unmet demand for higher education in the country, to retain student outflows, and to become themselves destination countries for overseas students (Shields and Edwards, 2010; Wilkins and Huisman, 2011; Ziguras and Gribble, 2015).

Data on the volume of TNHE are limited, but figures published by some countries show the magnitude of the phenomenon and that its importance is growing. In 2012/2013, there were more students studying in British TNHE than international students enrolled directly in the UK. In fact, more than 25% of the students studying for a British degree were doing so wholly overseas (HESA, 2014). In 2013, more than 25% of the international students studying in Australian higher education institutions were enrolled offshore (Australian Government, 2014). In 2012, more than 20 000 students were enrolled in German TNHE worldwide (Geifes and Kammüller, 2014). While no official data are available on the number of students enrolled in US higher education offshore, there is evidence that this country constitutes the biggest provider of TNHE worldwide. It is, indeed, the country with the most branch campuses<sup>1</sup> abroad (Lawton and

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<sup>1</sup> A ‘branch campus’ is a satellite campus of one university that is established in another country (Naidoo 2009). It constitutes one of the most common TNE activities.

Katsomitros, 2012) and American institutions are the most active in offering dual-degree programmes (Obst et al., 2011).

One of the main debates around TNHE concerns its potential in substituting onshore enrolment. Studying offshore can, indeed, present a less costly alternative to moving to the country of the education provider (Kapur and Crowley, 2008). The question, as posed by Skeldon (2005: 29), is: “If students can be trained locally, will they continue to move in such large numbers to developed countries for their education?”

Recent research tries to understand the motivations for choosing to study offshore (McNamara and Knight, 2014; Leung and Waters, 2013; Li et al., 2013; Pyvis and Chapman, 2005; 2007; Wilkins et al., 2012). Although valuable for deepening knowledge of TNHE students’ motivations, these micro level studies do not permit the assessment of whether, at a macro level, an increase in offshore enrolment is associated with a decrease in onshore enrolment. The only existing pioneering effort made from a macro level perspective is essentially descriptive (Tsiligiris, 2014).

The present paper attempts to overcome these limits, offering a macro level panel data analysis of enrolment in Australian higher education, within Australia and abroad. There are two goals: first, to investigate whether and to what extent the macro determinants of traditional student mobility, as identified by previous research, are also related to offshore enrolment, and second, to examine whether a link exists between onshore and offshore enrolment, and for its sign in order to assess whether they could be considered substitutes.

## **2. Literature Review**

### **2.1 Push-pull models of student mobility**

Most existing research on international student mobility tries to identify which factors push people to study abroad and which ones attract them to a particular destination. In the international migration literature, the push-pull model is widely applied and is usually implemented empirically, using the gravity equation<sup>2</sup> (Bessey, 2012; Karemera et al., 2000; Mayda, 2005). Within this framework, international migration flows from one country to another are modelled as a function of the characteristics of both countries. So, it is, for example, predicted that an increase in population in the country of origin and the associated “demographic pressure” (Hatton and Williamson, 2001) push more people to

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<sup>2</sup> An exhaustive guide to gravity models of international migration can be found in Beine et al. (2015).

go abroad, whereas the cost of mobility reduces migration. Applying the gravity equation to her analysis of student migration to Germany, Bessey (2012) shows how long distances discourage student mobility, and that politically free countries send more students abroad.

Some studies focus on the characteristics of countries of origin that can determine the amount of people seeking higher education abroad. McMahon (1992), for example, finds that the level of economic development in countries of origin correlates negatively with the volume of tertiary student emigration, whereas the degree of participation of the home countries in the global economy correlates positively with student mobility.

According to existing research, as masterly revised by Beine et al. (2013a; 2014), one of the main reasons driving people towards studying abroad is the unsatisfied demand for higher education in their home country (Agarwal and Winkler, 1985; Lee and Tan, 1984) and/or the quality difference between foreign and domestic degrees (Aslangbengui and Montecinos, 1998; Gordon and Jallade, 1996; Mazzarol and Soutar, 2002). As outlined by Beine et al. (2013a; 2014), this strand of research is in line with the school-constrained model (Rosenzweig, 2006), according to which student migration occurs because of the inadequacy of educational opportunities in the home country. According to this model, when students make the decision to study abroad, they hope to acquire higher quality education and to return to their country of origin after graduation. Hence, an increase in the higher education supply in the countries of origin reduces the number of people seeking education abroad.

Rosenzweig (2006), however, provided support for a competing explanation: the migration model. This model predicts that seeking education abroad constitutes a strategy to immigrate permanently to a foreign country to escape from low returns on education in the country of origin (Beine et al., 2013a; 2014). According to this explanation, because of the differences in wages worldwide, an increase in the higher education supply in the traditional countries of origin of international students provokes a rise in the number of people seeking education abroad.

This reviewed research does not consider the existence of TNHE, and yet, TNHE changes the characteristics of the educational sector of the countries where it is implemented and increases the opportunities for students to obtain a foreign degree. It is therefore important to examine the phenomenon when modelling the international mobility of students.

## 2.2 TNHE: Motivations for enrolling

Literature on the determinants of TNHE enrolment is still rather scarce. Some micro level research has been carried out to understand the motivations that lead students to join TNHE. According to Pyvis and Chapman (2005), students enrol in TNHE because of the perceived higher quality of an international programme compared to a local one, to experience foreign curricula and new teaching styles, the chance to get in touch with Western lecturers, and the possibility of obtaining a degree that is more widely recognised than one from their own country might be. These motivations seem very similar to those of traditional mobile students.

Wilkins et al. (2012) somewhat confirm these results. Lacking a model that explains enrolment in TNHE, the authors use a slightly modified push-pull model of international student mobility as an analytical tool to understand the reasons behind the enrolment at a branch campus. They find that some of the motivations pushing people to enrol in this particular type of TNHE are very similar to those of international mobile students, especially regarding the low quality of the higher education supply in the home country. The preference for TNHE over migration to the country of the education provider is, according to Wilkins et al. (2012), essentially due to convenience factors, such as avoiding the financial and social costs of migration.

These kinds of results seem to suggest that TNHE could constitute a substitute for student mobility. However, Leung and Waters (2013) highlight how the TNHE students they interviewed could not even consider studying overseas because of financial constraints. According to the results of a research project conducted by McNamara and Knight (2014: 34), TNHE meets the needs of students “who can’t or don’t wish to study abroad.” These two studies suggest that TNHE is absorbing different segments of students which differ from traditional mobile students because of their lack of aspiration and/or capability to study abroad. Nonetheless, this strand of research was conducted at a micro level and used a convenience sampling strategy, hence permitting neither generalization nor checking for macro level trends.

### 2.3 Linkage between TNHE and student mobility

From a macro level perspective, the relationship between TNHE and student mobility has not been at all clearly assessed and contrasting hypotheses have been made. TNHE is, on the one hand, generally considered a strategy for universities to grow enrolment (McBurnie and Ziguras, 2007; Ziguras and McBurnie, 2015) among different segments of students (McNamara and Knight, 2014). With this conviction, governments exporting

higher education often actively foster and promote the expansion of their universities' overseas operations (Ziguras and McBurnie, 2015). On the other hand, governments that open their educational market to foreign providers often do so with the goal of decreasing their student emigration (McBurnie and Ziguras, 2007; Ziguras and Gribble, 2015; Ziguras and McBurnie, 2015). For Kapur and Crowley (2008: 28–29), TNHE effectively permits the home country to retain those students “who would have otherwise gone overseas”. For this reason, MacReady and Tucker (2011) worry that TNHE is making it possible for students to gain some of the advantages of an international experience without leaving their home countries, and that students are increasingly able to find attractive alternatives to mobility to the traditional destinations through TNHE in their home country or through mobility to a neighbouring country where TNHE services are offered. Potentially this situation indeed could entail a loss of the financial benefits associated with onshore international students (Shields and Edwards, 2010).

On the one hand, offshore activities can heighten the overseas visibility of the educational institution providing them, enhancing the participation in its onshore programmes. On the other hand, offshore activities also are a “risky business” and could, in some cases, hinder the prestige of an educational institution, negatively affecting its capacity to recruit onshore (McBurnie and Ziguras, 2007).

This debate on the linkage between onshore and offshore enrolment has been almost exclusively speculative. To date, only one empirical attempt has explored this relationship from a macro level perspective (Tsiligiris, 2014). According to this study, the two types of enrolment cannot be considered as substitutes, because the student emigration from the host countries of TNHE considered in the study increased or remained unaffected by the growth of British TNHE in the area. Although inspiring, this study does not take into account other contextual factors that could be related to these trends, so the relationship should be tested further.

### **3. Case selection**

Because of data availability, the case under analysis is Australian. Indeed, only the UK and Australia provide detailed data on enrolment in their TNHE. British data provide information on how many people are studying for a British degree by country of campus location. However, they offer neither information regarding the students' country of origin, nor their country of permanent residence. Australian data, by contrast, contain information on students' citizenship, country of birth, country of permanent residence,

and campus location. The data thus allow for the exclusive consideration of international students, knowing where students permanently reside, and taking into account real mobility patterns. The data also cover a longer period of time.

Australia constitutes an interesting case study. It is one of the countries with the greatest reliance on trade in international education services. After the US and the UK, it is the third preferred destination country for students from abroad (OECD, 2013). Australia is also the OECD country with the highest share of international students (OECD, 2014) and the largest presence overseas relative to the size of its domestic tertiary sector (British Council & Oxford Economics, 2012: 21). Its institutions started to offer TNHE early on – since the mid-1980s – and its government had a key role in promoting the liberalisation of higher education (McBurnie and Ziguras, 2003). Australian TNHE is particularly present in Asia, the continent with the biggest supply of TNHE, and particularly in East Asia, the most important source of international students worldwide (OECD, 2009; Brooks and Waters, 2011).<sup>3</sup>

## **4. Methodology**

Using macro level data on enrolment in Australian higher education within Australia, i.e. onshore enrolment, as well as data on offshore enrolment, a panel data analysis is carried out. The analysis concerns the period from 2002 to 2011.

The aim is to explore the macro determinants of both types of enrolment and the linkage between them. In order to explore this linkage, however, one cannot simply regress one phenomenon on the other. Because the set of explanatory variables is likely to affect all types of enrolment, even if in different ways and with different intensities, a simultaneity bias could arise and result in spurious correlations. To find a specification that overcomes this problem, we rely on previous research on the linkages between international trade and foreign investment (Grünfeld and Monxes, 2003; Mitze et al., 2010). The model applied is a system of seemingly unrelated regressions equations (SURE). It is termed as such because the equations in the system seem unrelated and they can be estimated separately; they could, however, be related through the error correlation (Zellner, 1962). The logic behind the model is that it attempts to control for all the factors that might simultaneously determine the variables of interest. After all sources of simultaneity bias are assumed to be removed, the relationship between the residuals, i.e.

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<sup>3</sup> For an analysis of the position of Australia in the global ‘market’ of higher education, see Marginson (2007).



the unexplained variation, is analysed in order to check for significant correlation and its sign. In order to take heteroscedasticity into account, the results are obtained with SURE by maximum likelihood<sup>4</sup>, which allows for estimating clustered robust standard errors.

The data used provide information about the number of students enrolled in Australian higher education worldwide by country of permanent residence, after having excluded Australian citizens. The combination of these criteria makes it possible to exclude foreign students who reside permanently in Australia, having migrated there for other reasons (for example, as a child with the family) and to capture actual student mobility<sup>5</sup>. Only students who enrol for the first time are counted. This is more accurate than counting all students enrolled for two reasons: 1) if they do not change higher education provider, people are counted only once; and 2) the time of commencement of study is more closely connected with the moment when the enrolment decision was taken. In order to exclude exchange students, only students starting courses leading to a degree are counted.

Enrolment in TNHE consists of two different types: there are people who are enrolled in the country of permanent residence and others who move to a third country where TNHE is offered. It is important to distinguish between them, because the first does not imply any migration, whereas the second can be considered as a novel type of student mobility. Hence, a system of three “augmented” gravity equations is estimated:

$$\ln(y1_{it} + 1) = \alpha_0 + \alpha_1 \ln(EDU_{it}) + \alpha_2 \ln(LABOR_{it}) + \alpha_3 X_{it} + \alpha_4 Z_i + \gamma_t + \lambda_i + \varepsilon_{1it} \quad [1]$$

$$\ln(y2_{it} + 1) = \beta_0 + \beta_1 \ln(EDU_{it}) + \beta_2 \ln(LABOR_{it}) + \beta_3 X_{it} + \beta_4 Z_i + \gamma_t + \lambda_i + \varepsilon_{2it} \quad [2]$$

$$\ln(y3_{it} + 1) = \delta_0 + \delta_1 \ln(EDU_{it}) + \delta_2 \ln(LABOR_{it}) + \delta_3 X_{it} + \delta_4 Z_i + \gamma_t + \lambda_i + \varepsilon_{3it} \quad [3]$$

where  $y1_{it}$ ,  $y2_{it}$  and  $y3_{it}$  respectively indicate the number of students from country  $i$ , who, in a given year  $t$ , start to study for an Australian degree onshore within Australia,

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<sup>4</sup> The STATA ado file `mysureg` was used. It is downloadable from <http://www.stata-press.com/data/ml2.html> (last accessed 23/02/2015) as part of the `ml_ado` package.

<sup>5</sup> A particular type of student mobility, common amongst students from Taiwan, Hong Kong and South Korea, consists of moving overseas with the parents before the end of secondary school. One of the reasons for this type of migration is the attempt to pay lower tuition fees as permanent residents (Brooks and Waters 2011). For these three countries, I checked the correlations between the data by country of birth and those by country of permanent residence and found them to be very high. Thus, the use of data by permanent residence is un concerning.

offshore in their own country of permanent residence, and offshore in other countries. A challenging aspect of these dependent variables, common to macro level research on migration, is their highly skewed distribution because of the high number of observations with zero values in the series. A common strategy to deal with this situation is to take a logarithmic transformation of the dependent variable. However, as the logarithm of zero is undefined, the observations with zero values are dropped and omitted from the calculations. These real zeros are, nonetheless, meaningful, because they are related to interesting explanatory factors. Following previous literature (Bessey 2012; Capuano 2009), a very small value is added, so that no observation is lost when the natural logarithm is taken.

$EDU_{it}$  contains information about higher education in  $i$ . As a proxy for the unsatisfied demand for higher education, a variable measuring the gross enrolment ratio is added, i.e. the number of students enrolled in the country as a percentage of the people of an eligible age for tertiary education. This variable can be considered as a better proxy compared to the public expenditures in education, because this latter variable fails to capture other types of educational opportunities. Moreover, “funding for TNHE may be unrelated to overall higher education spending, since it often comes from economic development agencies and international relations departments” (McNamara et al., 2013: 33). In order to take into account the people who are studying abroad, another variable, the gross mobility ratio, is added. This is the number of students studying abroad as a percentage of total tertiary enrolment in that country. It is a proxy for what Carling (2014: 3) calls the “emigration environment”, i.e. the overall mobility context common to the members of a community, which can influence their choices. As this variable can constitute a source of endogeneity in the model, the results obtained without it are also provided.

$LABOR_{it}$  indicates labour market opportunities in the home country that can motivate the choice to study abroad as a ‘migration strategy’. A variable that measures unemployment rates is added as a proxy (as in Capuano, 2009).

$X_{it}$  contains time-variant controls. As in previous research using gravity equation models (Bessey 2012; Mayda, 2005; Ortega and Peri, 2013), GDP per capita and population size are included. GDP per capita is a proxy for average economic wealth. Regarding the population, it is expected that its rise is associated with an increase in emigration. A variable indicating whether the citizens of one country must have a visa to

enter Australia<sup>6</sup> is also included. Research shows that visa policies can have an effect on migration flows (Bertoli and Fernández-Huertas Moraga, 2013; Bertoli et al., 2011; Bertoli et al., 2013; Grogger and Hanson, 2011). Difficulties in getting the visas required to enter Australia could also lead to a preference for offshore enrolment.

$Z_i$  contains the time-invariant controls. Two proxies for the migration costs are included, namely the geographical distance between the country of permanent residence and Australia and a variable indicating whether they both share a common official language. These two variables are excluded in the specifications where country dummies ( $\lambda_i$ ) are introduced. These dummies control for countries' unobserved heterogeneity, which might be correlated with all the variables in the empirical model. As only one country of destination is considered, they also capture country-specific economic and cultural links with Australia. It would be advisable to add a variable to control for TNHE policies in countries of origin. Unfortunately, to my knowledge, there is currently no dataset in which such information is available for every country in the world. As shown in recent literature on international migration, the stock of skilled migrants already living in the destination country constitutes an important attraction factor for students (Beine et al. 2013a, 2014). As remarked by Beine et al. (2013b: 26), "at the annual frequency, migration stocks are quite stable over time". This implies that we partly account for some network effects with the introduction of country dummies. While the inclusion of a network variable would be desirable if data were available, the specification and the limited time span over which estimations are conducted makes this omission less concerning.

All variables, their precise definition and data sources are provided in Table 1.

(TABLE 1 HERE)

All the specifications include  $\gamma_t$  (year dummies), accounting for the specificity of one particular year that can affect all the countries. As the analysis concerns only one country of destination, the introduction of year dummies also controls for changing characteristics of Australia that could influence the number of students seeking to study in Australian higher education. They control, for example, for changes in the Australian attitude towards international students but also for changes in the wages of tertiary educated

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<sup>6</sup> Note that visa policies are based on citizenship, whereas the dependent variables are based on the country of permanent residence.

workers in Australia, which recently were considered as a crucial pull factor for international students (Beine et al., 2013a; 2014).

Table 2 shows the descriptive statistics of all the variables included in the analyses.

(TABLE 2 HERE)

$\varepsilon_{1it}$ ,  $\varepsilon_{2it}$  and  $\varepsilon_{3it}$  are the error terms. SURE allows them to be correlated and makes it possible to check for the correlation coefficients of the cross-equation residuals at the end of the estimations. Negative correlations between them are interpreted as a substitutive relationship, whereas positive correlations are interpreted as an indicator of an enhancing association.

## 5. Results

### 5.1 Determinants of onshore and offshore enrolment

Table 3 presents the results of the empirical analysis of the determinants of enrolment in Australian higher education.

(TABLE 3 HERE)

M1 is the model in which only the variables of the baseline gravity equation (population, GDP per capita, distance and common language) are introduced. The results of Eq. [1], an equation which measures student mobility to Australia, are in line with previous research and highly statistically significant. Countries with a larger population and a higher GDP send more students abroad, whereas distance discourages migration. Sharing a common official language with Australia is positively associated with student mobility to Australia. This variable is less significant than the others. It is understandable, considering that the official Australian language is English, which is widely diffused in many countries as a second language. All the coefficients have the same signs and are significant in the other two equations in which the dependent variables count the students commencing an Australian higher education degree offshore. This is not surprising. People from countries that are very far from Australia may not have any information about Australian higher education, and Australian TNHE is surely more present in countries where there is already a demand for its higher education. This specification does not take into account the time-invariant specificity of each country, which can motivate

any sort of enrolment in Australian higher education. To deal with this unobserved heterogeneity, country dummies are introduced in the other two models.

In M2 and M3, according to the results of Eq. [1], GDP per capita and population are positively related to student mobility to Australia. However, only the variable measuring the population is statistically significant in both models, indicating how an increase in the “demographic pressure” (Hatton and Williamson, 2001) in one country pushes people to seek education in another. The variable connected with the satisfied demand for higher education in one origin country is positively related with student migration and an increase in unemployment is associated with an increase in the number of students who go to study directly in Australia. These results are both significant at the 5% level in M3, thus apparently supporting the migration model of student mobility proposed by Rosenzweig (2006).

In Eq. [2], the dependent variable refers to students enrolled directly in the country where they are residing. Consistently, the traditional gravity equation variables (GDP per capita and population) display negative signs. However, only the result for GDP per capita is statistically significant in M3, although with a low significance level of 10%. The dependent variable is here negatively associated with the unemployment rates. If the labour perspectives in the country improve, more people will choose to get foreign degrees directly in the country where they are living. Another significant result, at a level of 1%, concerns the visa requirement. This indicates that the obligation to have a visa to enter Australia increases the number of people who seek Australian higher education offshore in their own country.

Eq. [3] concerns students enrolled in Australian higher education offshore in a country different to that in which they are permanently residing. Here, GDP per capita and population display the same signs as in Equation 1, which is not surprising if we consider that this equation also estimates student mobility. However, in this estimation, all the coefficients are not significant, except the one that measures the student mobility ratio. This can be considered as a proxy for the “overall migration context” (Carling 2014), which may influence the mobility behaviour of people in the country. The results of this equation should be regarded with caution. There is still an important gap in the literature concerning this new form of student mobility, and further research is needed in order to identify the possible mechanisms at stake. Additionally, further research should take into account variables related to the countries into which the students are moving to acquire TNHE.

## 5.2 The linkage between offshore and onshore enrolment

Table 4 shows the cross-equation residual correlations that indicate the linkage between the various types of enrolment in Australian higher education. The results of four models are presented. M0 refers to a model where only year dummies are introduced. M1, M2 and M3 show the cross-equation residuals' correlations of the three models presented in Table 3. A Breusch-Pagan test of independent errors is conducted<sup>7</sup> in order to test whether the residuals from the three equations are independent. The highly significant results of the test, shown in the table, indicate that the errors are not independent.

(TABLE 4 HERE)

In M0 the correlations are positive and very high. However, many factors are simultaneously affecting the three variables. Thus, these relationships are very likely spurious. As is apparent, introducing to the models relevant factors that can influence enrolment in Australian higher education, both onshore and offshore, leads to a gradual decrease in the coefficients. This proves that consideration of the simultaneity bias is fundamental when looking at the relationship between TNHE and student mobility.

In M3 all assumed sources of simultaneity are introduced into the model and the subsequently obtained cross-equation correlation of residuals are displayed. The results of M3, the most comprehensive model, show how the correlations are positive in all three cases, if however fairly weak. The Breusch-Pagan test indicates that these relations are statistically significant, at a level of 0.1%. These weak positive cross-equation residual correlation's coefficients seem to confirm that TNHE cannot be considered a substitute for traditional student mobility.

## 6. Discussion and conclusion

This research has two goals. It investigates whether and to what extent the macro determinants of traditional student mobility, or onshore enrolment, as identified by previous research, are also related to offshore enrolment. Subsequently, it examines whether there is a relationship between onshore and offshore enrolment, and searches for its sign in order to assess whether they could be considered substitutes.

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<sup>7</sup> This was conducted using the Stata official command sureg.

In comparison with previous research, the analysis offered goes beyond the mere description of trends in both types of enrolment. Moreover, the research has three notable strengths. Firstly, the combination of the criteria of citizenship and of country of permanent residence of the students provides a fairly accurate measure of student mobility. Secondly, the methodology overcomes the simultaneity bias, which, if not considered, could result in spurious correlations. Finally, TNHE enrolment in a student's own home country, which does not imply any mobility, and TNHE in a third country, which can be considered a novel form of student mobility, are considered separately.

The consideration of only one higher education exporting country and the short time span available may undermine some results and call for caution in their interpretation. Nonetheless, the results are worth noting and present valuable starting points for future research.

Concerning the determinants, the results show that the macro factors that influence onshore enrolment are also related to offshore enrolment, even if some are related with a different intensity and in a different way. The requirement of a visa to enter Australia increases the number of people who seek Australian higher education offshore in their own country. An increase in the satisfaction of demand for higher education in one country is positively associated with the number of people who go to study in Australia. An increase in unemployment in one country of origin is also related to an increase in the number of people who seek higher education directly in Australia and with a decrease in those who enrol in Australian TNHE within their own country. These results seem to be in line with the "migration model" of student mobility (Rosenzweig, 2006). According to this model, all other things being equal, greater investment in higher education and the associated increase in tertiary educated people in one country of origin are positively related to tertiary student emigration (Beine et al., 2013a; 2014; Rosenzweig, 2006).

Regarding the linkage between TNHE and student mobility, a positive and statistically significant relation, even if fairly weak, was found. The weakness of the linkage indicates that the different types of enrolment are absorbing different groups of students. Studying overseas on campus may normally be considered more prestigious than studying offshore (Brooks and Waters 2011). Thus, people who have the opportunity to study abroad may do so despite the existence of TNHE. The opportunity given through the implementation of TNHE can awaken new interest and determine enrolment in people who would not have considered foreign education if this opportunity were not available. The positive sign of the linkage may indicate that the amount of people from one country enrolled in

Australian TNHE increases visibility and heightens interest in onshore programmes and vice versa. This shows how, as stressed by Findlay (2011: 181), in order to understand “the geography of international students”, it is fundamental to consider the “supply-side practices”. In the future, migration scholars will, hopefully, give more attention to the spread and importance of TNHE.

In light of these results, it seems that TNHE by itself is not a sufficient strategy for countries that traditionally send students to retain them. On the contrary, an increase in the higher education supply in one country of origin, and the consequent increase in tertiary-educated individuals, could even increase the number of people seeking higher education abroad. All this should be taken into consideration by those countries that aim to reduce their student outflows merely by opening their educational market to foreign providers. If not accompanied by an improvement in labour opportunities and conditions, this policy may indeed be counterproductive. Indeed, labour opportunities in the countries of origin seem to play a crucial role and their improvement is negatively related to the number of people who go study abroad. These results clearly show how higher education cannot exclusively be considered as a consumption act; rather, it is also a strategy to acquire ‘capital’ to be spent after graduation in the home country labour market or overseas. Thus, labour migration theories can contribute definitively to better understanding enrolment in international education and should, therefore, enjoy more consideration in future research by higher education experts.

The results of this paper encourage a reflection on the need to overcome “educationalism” (Dale and Robertson, 2007), by taking into account extra-educational structure and dynamics when analysing educational issues, as was highlighted by Verger (2010). They also point out the importance of focusing on educational structures and dynamics when analysing extra-educational issues, such as the international mobility of people. Hopefully, these kinds of considerations will inspire future research and stimulate fruitful interdisciplinary collaborations.

This research is not exempt from shortcomings and further research could be carried out in several directions. If data spanning longer periods of time were to become available, it would be interesting to conduct a dynamic panel analysis to check whether and how past values of the dependent variables are related to current ones. If data were to be produced in other national settings, it would be useful to test the results of this study with other countries that are very active in offshoring their higher education supply. Data availability from different countries would also permit taking into account multilateral



resistance to migration due to the attractiveness of alternative destinations (Bertoli and Fernández-Huertas Moraga, 2013) and to pay more attention to the phenomenon of offshore enrolment in third countries. Another fundamental point that should be explored further concerns the perceived prestige of TNHE programmes in comparison to those offered at home campuses. More space for “the voice of the students” (Pyvis and Chapman, 2005: 40) should ultimately be provided, along with implementing micro level surveys, and conducting qualitative in-depth interviews among TNHE students in order to better understand how they perceive TNHE, what drives them to enrol beyond labour opportunities, and their attitudes towards international mobility.

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## Appendix: Tables

TABLE 1: List of variables

Variable	Description	Source
Onshore commencements	Number of students who start studying in Australian higher education within Australia.	
Offshore commencements (immobile)	Number of students who start studying in Australian higher education in the country of permanent residence.	Australian Department of Education
Offshore commencements (mobile)	Number of students who start studying in Australian higher education in a country not equal to that where they are permanently residing.  Distance education is not considered. In the original dataset, counts less than 5 (from 1 to 4) are indicated as < 5. These counts are substituted with 3.	
Geographical distance	Bilateral distance between the biggest cities weighted by the share of the city in the overall population. (Mayer and Zignano 2006).	CEPII
Common official language	= 1 if the country shares an official language with Australia	CEPII
GDP per capita	Gross domestic product divided by midyear population. Data in constant U.S. dollars.	World Bank Development Indicators
Total population	All residents regardless of legal status or citizenship (midyear estimates).	World Bank Development Indicators
Gross enrolment ratio, tertiary	Total enrolment in tertiary education expressed as a percentage of the population in the official age group corresponding to tertiary level education.	UNESCO/UIS
Gross mobility ratio	Ratio of students abroad in relation to those enrolled in domestic tertiary institutions.	UNESCO/UIS
Unemployment rate	Share of the labour force that is without work but available for and seeking employment.	World Bank Development Indicators
Visa	= 1 if citizens of the country must have a visa to enter Australia.	DEMIG*

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**TABLE 2: Summary Statistics**

<b>Variable</b>	<b>Min.</b>	<b>Max</b>	<b>Mean</b>	<b>Std. Dev. (overall)</b>	<b>N. Obs.</b>
Onshore commencements +1 (log)	0	10.62459	3.450617	2.308943	1167
Offshore commencements (immobile) +1 (log)	0	8.525558	.7604989	1.912788	1167
Offshore commencements (mobile) +1 (log)	0	7.086738	1.247176	1.518581	1167
Distance weighted (log)	7.914384	9.777957	9.441428	.319513	1152
Common official language	0	1	.1901893	.3926194	1162
GDP per capita (log)	4.682266	11.63054	8.26924	1.622685	1167
Population (log)	12.43626	21.01901	16.05215	1.640854	1167
Unemployment rate (log)	-1.609438	3.653252	1.901208	.748353	1167
Gross enrolment ratio (log)	-1.50792	4.769764	3.101249	1.166028	1167
Gross mobility ratio (log)	-1.94547	7.304046	1.547505	1.251766	1167
Visa	0	1	.9537275	.2101647	1167



**TABLE 3: Enrolment in Australian higher education, onshore-offshore (2002-2011), SURE**

<b>EQUATION. 1</b>			
<i>Dependent variable:</i>	<b>(M1)</b>	<b>(M2)</b>	<b>(M3)</b>
<b>Onshore comm.</b>			
Total population	0.783*** (0.07)	0.843* (0.36)	0.959** (0.37)
GDP	0.696*** (0.10)	0.337** (0.13)	0.204 (0.13)
Distance	-3.354*** (0.80)		
Common language	0.625* (0.31)		
Gross enrolment ratio		0.063 (0.09)	0.384* (0.18)
Unemployment		0.221* (0.11)	0.201* (0.10)
Visa		0.078 (0.08)	0.062 (0.08)
Gross mobility ratio			0.358* (0.17)
Constant	16.814* (7.53)	-12.968** (5.01)	-15.284** (5.32)
<b>EQUATION. 2</b>			
<i>Dependent variable:</i>	<b>(M1)</b>	<b>(M2)</b>	<b>(M3)</b>
<b>Offshore comm. (immobile)</b>			
Total population	0.453*** (0.10)	-0.577 (0.38)	-0.532 (0.40)
GDP	0.328*** (0.09)	-0.324 (0.23)	-0.375+ (0.22)
Distance	-2.993*** (0.74)		
Common language	0.867** (0.34)		
Gross enrolment ratio		0.238 (0.19)	0.137 (0.18)
Unemployment		-0.433+ (0.25)	-0.441+ (0.25)
Visa		0.515** (0.18)	0.509** (0.18)
Gross mobility ratio			0.360 (0.31)
Constant	18.729** (6.79)	9.891 (6.68)	9.007 (7.12)
<b>EQUATION. 3</b>			
<i>Dependent variable:</i>	<b>(M1)</b>	<b>(M2)</b>	<b>(M3)</b>
<b>Offshore comm. (mobile)</b>			
Total population	0.439*** (0.07)	0.797 (0.60)	0.882 (0.58)
GDP	0.191** (0.06)	0.385+ (0.21)	0.289 (0.21)
Distance	-2.163*** (0.62)		
Common language	0.702** (0.23)		
Gross enrolment ratio		0.038 (0.12)	0.272 (0.17)
Unemployment		0.050 (0.12)	0.035 (0.11)
Visa		0.004 (0.15)	-0.009 (0.15)
Gross mobility ratio			0.260* (0.13)
Constant	12.918* (5.87)	-13.611 (8.43)	-15.291+ (8.22)
Observations	1054	1167	1167
Clusters	148	153	153

\*\*\*p ≤ 0.001; \*\*p ≤ 0.01; \*p ≤ 0.05; +p ≤ 0.1.

**TABLE 4:** Cross-equation residual correlation matrix

<b>Linkage</b>	<b>(M0)</b>	<b>(M1)</b>	<b>(M2)</b>	<b>(M3)</b>
Onshore – Offshore immobile	0.659	0.344	0.076	0.072
Onshore – Offshore mobile	0.746	0.515	0.060	0.050
Offshore immobile – Offshore mobile	0.656	0.376	0.092	0.089
Breusch-Pagan Test: $p \leq 0.001$	***	***	***	***

\*\*\* $p \leq 0.001$