Returns to Elite Higher Education in the Marriage Market: Evidence from Chile*

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Abstract

In this paper we estimate the marriage market returns of attending a higher ranked (”elite”) university by exploiting unique features of the Chilean university admission system. Since this system is based on a centrally administered entry test, it not only constitutes an ideal context for using a regression discontinuity approach to identify causal effects, but it also provides us with a quality measure for all applying students and their partners.

We find that being able to attend a higher ranked university has substantial returns in terms of partner quality. While our estimates show that there are marriage market returns for both sexes, they also indicate that they are more pronounced in the case of female students. Moreover, we analyze how the returns vary with the students' background and how they differ for different types of universities-degree programs (e.g. top degree programs, large degree programs etc). We find that returns are highest for students in top degree programs, for men in programs with many women, and for students from higher socioeconomic backgrounds as measured by parental education and occupation.

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1 Introduction

Economists have long been interested in understanding the individual and social implications of education. The main focus of the existing literature has been on the estimation of labor market returns. Far less attention has been dedicated to marriage market outcomes and reproduction success, even though these outcomes are likely to be just as important for individuals' wellbeing as are labor market outcomes.

Another important aspect that only few papers in the literature consider is the fact that universities often differ considerably in the quality dimension (for a discussion of the importance of vertical differentiation in the US, see Hoxby (2009)). In environments where the difference between elite schools at the top of the quality ranking and schools at the bottom are large, it might well be the case that the returns along the quality margin are larger than those in the quantity dimension.

The key contributions of this paper are twofold. First, at the individual level, our goal is to provide a detailed account of the effects of a vertically differentiated education system on one of the most important determinants of individuals' wellbeing: the performance in the marriage market. It is natural to assume that an individual's educational attainment (as measured not only by years of education, but also by the rank of the educational institution which the individual attended) significantly affects the success in the marriage market. By attending a higher ranked university an individual maximizes his direct contact with potential high quality partners at an age where many partnerships are formed. Moreover, the fact that an individual has been admitted to a better university might be interpreted by potential partners as an important signal of the candidate's quality. Finally, if higher-quality education improves an individual's labor market returns, it indirectly increases this individual's attractiveness as a partner. This paper aims to help closing the gap in the literature with respect to the link between education quality and marriage market outcomes.

Our second objective refers to the social implications of a vertically differentiated university system. In particular, our focus will be on the role of the university system in affecting household inequality and intergenerational mobility through the effect on assortative mating. Since most individuals live in partnerships, it is likely that their wellbeing depends not only (and possibly not mainly) on their personal income but also on resources available to the household. The level of inequality between households depends on how these households are formed, i.e. on the degree of assortative mating. This implies that an education system that influences the degree of assortative mating plays a crucial role in determining inequality at the household level. To investigate the link between the vertical differentiation of the education system and assortative mating, we analyze how the returns in the marriage market depend on individuals' types (ability and/or socio economic background). Even though quality differences in education are likely to contribute to the emergence and persistence of household income inequality, there is very little evidence on this link in the literature.

Addressing these questions poses two major challenges, the identification of causal effects and data availability. First, credible identification of the causal effect of going to a better university is challenging

because the quality of universities strongly correlates with the quality of the students who attend them. In particular, individuals select into universities based on their (at least partially unobservable) characteristics, such as their ability and/or family background. Thus, better outcomes for individuals from higher quality schools can be due to (a) the fact that these individuals are of "higher quality" themselves (selection) or (b) because of a causal effect of going to a "higher quality" school. Data availability constitutes a second important problem, since information on individuals' college admission outcomes has to be combined with long-run data on marriage market outcomes. Moreover, the analysis regarding partner quality requires the availability of suitable quality measures.

Our strategy to overcome these problems exploits the unique setting of the Chilean university system, which combines the following two important characteristics. First, it provides us with an exogenous source of variation in terms of who gains access to the higher ranked university. Chile is one of the few countries with a centralized authority that allocates students to universities (and degree programs) based solely on the basis of two factors: i) on students' preferences over program-university combinations and ii) on students' scores in the national university entrance test and their high school grade, both of which are observable.[1] In particular, each student is assigned to the program-university combination that is her most preferred one among those for which she is good enough (as measured by her test score). Thus, this procedure defines for each program-university combination a cutoff in terms of test scores. By restricting attention to individuals with test scores that are in close neighborhoods on either side of these thresholds we are able to hold (almost) constant the individual quality dimension, while the treatment in terms of education quality is different on the two sides of the threshold. Thus the desired treatment effect can be obtained from the comparison of these individuals. In other words, we exploit a regression-discontinuity design to identify the causal effect of attending a higher quality (elite) university.

The Chilean context is also unique in terms of data availability. For our purposes it is crucial to link information on individuals' entrance test scores and their allocation to university-degree programs with data on their partners. Chilean institutions have been very forthcoming in providing us with the necessary data, such as data from the Marriage Registry (Ministry of Justice) which links data on university applicants to information on their spouses (see data description below).

Furthermore, the entry test provides us with an ability/quality measure not only for the enrolling students, but also for their partners. This is so because a large fraction of the students has a partner that has attended university too. Moreover, since the entry test is used as signal in the labor market, it is taken not only by prospective university students but also by almost all other high school graduates who do not continue their studies. In the last decade almost 80% of the individuals of each cohort have graduated from high school. This means that for these years we have quality data for almost the entire pool of potential partners for our subjects.

While Chile provides an ideal context to address our questions of interest, strongly vertically differ-

[1] Much like in many European countries and in contrast to the US, students have to apply for a specific degree program. The admission process is described in details in Section 2.1.

entiated university systems prevail in many other countries as well (such as France, UK and US). Hence, what we learn from the Chilean case can provide relevant insights for other countries that share the same type of university system.

From the above description of the admission system and our empirical strategy that is based upon it, it should be clear that the term 'education quality' has a subjective interpretation in our context. That is, by comparing individuals on the two sides of the admission thresholds, we identify the effect of being assigned to one's more preferred program-university combination. While individual rankings of degree programs need not necessarily coincide with objective measures of the quality of the degree programs, one would expect that subjective rankings reflect objective quality differences at least to some degree (compare Avery, Glickman, Hoxby, and Metrick (2013) who make use of college choices of high-achieving students to create a revealed preference ranking of American colleges and universities). We will discuss the relation between subjective rankings and objective quality measures in Section 5.3.

The main findings of this paper are as follows: We find that attending a higher ranked university has a sizable effect on the quality of an individual's spouse. This effect is more pronounced for female students.

In terms of heterogeneity with respect to university/program characteristics, we show that marriage market returns are largest at the highest level of educational quality, i.e. jumps in terms of partner quality are larger when getting into a top ("elite") versus a lower ranked university (compared to jumps at the lower end of the quality spectrum). Furthermore, we also find particularly large effects on spouse quality for men in programs with many women. This suggests that one explanation for our findings is that universities act as meeting places and that "market thickness" of these meeting places is a relevant factor.

Another result that points in the same direction is that the likelihood of marrying someone who went to the same university(-program) increases at the cutoffs. This can be explained by the fact that the individual who is accepted to the better university has a large pool of potential high-quality partners, while the individual who just missed the cutoff and thus has a pool of lower quality partners has a stronger incentive to find a good partner elsewhere.

On the other hand, we show that the "meeting place" argument cannot be the whole story. Only 14% of individuals in our data have a partner who attended the same university, while less than 4% attended also the same program. Thus for at most 14% (4%) of couples the university (degree program) could have constituted the relevant meeting place. We argue in the paper that the magnitude of the effects that we find cannot be driven by such a small subset of the population, implying that other channels have to play important role. A likely candidate for such an alternative channel is the signalling value of getting into a higher ranked university. The admission to a top university carries information about the individual's talent, future labor market earnings and family background, all of affect the individual's attractiveness in the marriage market.

Lastly, we find that individuals from higher socioeconomic backgrounds experience particularly large effects of attending a better university(-program) on partner quality. For example, women with college

educated fathers experience returns that are six times as large as women whose father did not attend college.

The latter finding suggests that the organization of a country's university system may have important social implications. In particular, the fact that a university system can have a differential impact on the mating behavior of the rich and the poor suggests that its organization may have important implications for the degree of assortative mating that characterizes a country. Since the degree of assortative mating is an important determinant of household inequality and social mobility, it follows that a strongly vertically differentiated university system might have relevant social consequences that emerge through the marriage market.

Apart from the social implications of a vertically differentiated university system, which are of direct interest to us as economists, our results on individuals' returns in the marriage market help to explain the following empirical facts/puzzles. First, the gender differences that we find with respect to the magnitude of marriage market effects helps to explain the female "university enrollment" puzzle. In most high and middle-income countries, female university enrollment rates are at least at the level of the enrollment rates of males (in Chile about 50% of undergraduates are women). This is rather surprising in light of the fact that the labor force participation rates of women are often significantly lower than those of men (in Chile only 42% of women participated in the labor force in 2003, in 1990 the fraction was even lower with 32%). If a significant share of the female population attends university even though they are not compensated by some form of labor market returns, then they must be attracted by other forms of returns.

A natural candidate for an alternative source of returns that are important enough is the marriage market. The potential importance of marriage market returns in rationalizing female college enrolment decisions has first been put forward by Goldin (2006) (see also Goldin, Katz, and Kuziemko (2006)). Our results are consistent with this view.

Our findings are also in line with those of Bailey and Dynarski (2011). They provide evidence for rising inequality in educational attainment in the US over the past 30 years and they argue that the increasing gap is mostly driven by women. That is, they show that women from high socioeconomic backgrounds have increased their educational attainment more than any other group. They conclude that the explanation for this empirical fact must lie in "segregated labor markets and asymmetric marriage markets", since women grow up in the same families and face the same tuition costs as men etc. Our results fit very well with their conclusion. Not only do we find that women have higher marriage market returns than men, but we also show that these returns increase with socioeconomic status.

Related literature

A large body of literature has estimated the labor market returns to education (for a survey on labor market returns, see e.g. Card (1999)). The vast majority of the papers in this literature analyzes the returns to years of schooling. On the other hand, the literature on returns to the quality of education is still rather slim, despite the fact that quality differences among schools and among universities can be

enormous (see Hoxby (2009) for evidence on American colleges and universities).

Notable exceptions in terms of estimating returns to university quality in the labor market are Berg-Dale and Krueger (2002), Dale and Krueger (2011), Hoekstra (2009) and Saavedra (2009), where the latter two papers apply a regression-discontinuity approach as this paper. There is also a number of papers analyzing the returns to going to a higher quality school on academic outcomes and use the same methodological approach: Clark (2012), Duflo, Dupas, and Kremer (2011), Jackson (2010) and Pop-Eleches and Urquiola (2011).

The main distinguishing feature of our paper compared to the above mentioned papers is our focus on marriage market returns.

Throughout history the family has been the most important institution in all societies (see Becker (1981)). In light of this fact it is very surprising, that our knowledge about how education impacts marriage market outcomes (and thus family formation) is still very limited. The hypothesis that marriage market considerations are an important determinant for individuals' educational decisions was first put forward by Goldin (1992) (see also Goldin (2006) and Goldin, Katz, and Kuziemko (2006)). Goldin (1992) provides descriptive evidence that for American women who graduated between 1945 and 1960, nearly half of the return to college came in the form of higher earnings of the spouse.

In recent years, there has been a rising interest in the relationship between education and marriage market outcomes. Attanasio and Kaufmann (2012) and Lafortune (2010) show that marriage market considerations play a role in education decisions, but do not estimate returns to education in the marriage market. Oreopoulos and Salvanes (2011) estimate returns to years of schooling in terms of the probability to be married. Chiappori, Iyigun, and Weiss (2009), Chiappori, Salanie, and Weiss (2011) adopt a structural approach to provide evidence on the marital college premium. Further papers on marriage and matching are, for example, Choo and Siow (2006) and Siow (2008) .

A few papers estimate other non-monetary returns to years of schooling related to family formation. For example, Currie and Moretti (2003) and McCrary and Royer (2011)) estimate the effect of years of schooling on child quality and fertility.

The novelty of this paper is to contribute to the literature by providing first evidence on the causal effect of attending a higher ranked university on individuals' marriage market outcomes.

Lastly, our paper is related to a literature linking education to inequality and intergenerational mobility. A large literature measures inequality and intergenerational mobility in different countries and over different time periods. More recently, the literature has placed increased emphasis on trying to understand the underlying mechanisms (see Black and Devereux (2010) for a survey on recent advances). Papers that analyze the effect of changes in years of schooling due for example to changes in compulsory schooling laws- on inequality and intergenerational mobility, are for example Behrman and Rosenzweig (2002), Black, Devereux, and Salvanes (2005) and Solon (2004).

Also it has been recognized that household inequality and its' persistence (intergenerational mobility)

is related to the degree of assortative mating that characterizes the society (see among others Chadwick and Solon (2002), Lam and Schoeni (1993), Olivetti and Paserman (2011)). For the relationship between marital sorting and inequality, see, e.g., Greenwood, Guner, and Knowles (2003) and Guner, Fernandez, and Knowles (2005).

To the best of our knowledge the literature has not considered the role that the vertical differentiation of the education system plays with respect to inequality and intergenerational mobility. We aim to contribute to this literature by studying the effects on household inequality through the impact on marital sorting.

2 Data and Institutional Background

In this section we describe the institutional setting of Chile and the data that we will be exploiting. The information that we are reporting

2.1 Institutional Background

General facts on the Chilean Higher Education System:

The following information is taken from the OECD/IRDB/World Bank report (2009) on "Tertiary Education in Chile" and from the Chilean Ministry of Education (MINEDUC). Further background information on Chile in terms of inequality in access to college, gender related issues, marriage behavior and so forth can be found in Appendix C.

The OECD classifies Chile as an upper middle-income country (GDP per capita in USD current PPPs: 11,736 in 2004 and 17,312 in 2011). The percentage of 20-24 year olds who had at least completed secondary education rose from 52% in 1990 to 75% in 2006 (according to MINEDUC, the Chilean Ministry of Education).[2] In 2006, 96% of the richest income quintile and 62% of the poorest income quintile had graduated from high school. Among 18-24 year olds around 34% are in tertiary education in 2006 (16.3% in 1992).

The admission to the public (and parts of the private) university system and the allocation of entering students to universities and degree programs within the system is decided in a centralized procedure. This centralized system is administered by DEMRE, a unit of the Universidad de Chile that acts in the name of all member universities of the Consejo de Rectores de las Universidades de Chile (CRUCH, Council of Rectors of the Chilean Universities). CRUCH represents not only all public universities but also a number of private universities (among them the Pontificia Universidad Catolica de Chile and other catholic universities).

In the time period to which our analysis refers (the years 2001 and 2002) about two thirds of all stu-

[2] In Chile, compulsory education lasts 12 years, typically starting at the age of 6.

dents were enrolled in a member institution of CRUCH. CRUCH universities are more prestigious than non-member universities. According to the OECD report on Higher Education in Chile 2008, "Virtually all young people in Chile, given a free choice, would rank their preferences as follows: (1) CRUCH universities (2) private universities (3) professional and technical institutions. This ranking reflects institutions' relative prestige and perceived potential to boost future income, and also - a crucial factor for students from poorer families - the much better financial aid packages currently available at CRUCH universities."

The basic qualification for admission to the CHRUCH universities is the school-leaving certificate. In addition, applicants have to sit an admission test, the so called Prueba de Selección Universitaria (henceforth, PSU). The general PSU consists of a verbal and a mathematical part. Depending on the degree programs that students intend to apply to, they may also have to sit more subject specific tests.

Admission to CRUCH insitutions is confined to those school-leavers who achieve a PSU score above a certain threshold. Students who do score above this minimum may apply through DEMRE for slots at CRUCH universities. In their applications they may list up to eight options in the order of their preference. Each option has to specify a degree program that the student would like to attend and a university at which he would like to attend the program.

Once students have submitted their applications with their preferences, DEMRE proceeds to allocate students to the available slots. The guiding principle of the allocation process is to respect the applicants' preferences whenever that is possible and to give precedence to students with better PSU scores and school leaving reports.[3]

Even though it is not necessary for entry to technical and certain professional institutions, a large majority of school-leavers take the PSU test. Population estimates suggest that in 2008 there were around 240 000 18 year-olds in Chile. According to the OECD report on Higher Education in Chile, fewer than 200,000 young people left secondary school with their school-leaving certificate at the end of 2007 (since close to 80% successfully completed high school). At the same time, nearly 217 000 people took the PSU test in December 2007 for university entry in March 2008. This suggests that significant numbers of those who left school in previous years also sit the PSU.[4]

2.2 Data Sources

To implement our project and address our questions of interest, we use data from the following sources and for the following samples of individuals.

First, we use data on individuals' performance on the university entrance tests and information to which university-program individuals were accepted or shortlisted. We plan on using data for individuals

[3]PSU scores and school leaving reports are aggregated into a total score and this total score determines the precedence ranking of students.

[4]To explain this large number it is important to note that some people take the test several times. In our estimation we only use individuals that take the test for the first time.

taking the test during the period of 1988 to 2007. The institution that organizes the test, DEMRE, provided us with digitalized data for 2001 to 2007, which we are using in this paper. We have digitalized data for the years before 2001 and are waiting for these data to be merged (see below).

Our second data source is the Chilean marriage registry ("Servicio de Registro Civil e Identificacion" of the Ministry of Justice), who provided us with the information about the identity of the individuals' spouses (for those individuals who got married before 2012) and children (born until 2012). The merge was conducted based on the national identification number, RUN (which is equivalent to the tax ID, RUT, for Chilean citizens and residents).

For this paper, we use individuals who took the test in 2001 and 2002 and submitted a valid application (i.e. they scored above 450 on the PSU test and listed at least one valid university-program on their choice list).[5] These individuals were at least 28 or 29 when we conducted the merge to determine if/to whom they were married until 2012 and whether they have children until 2012. We do not use the younger cohorts (yet) to avoid low marriage rates.

We measure the quality of the spouses/partners in terms of their performance on the university entrance test. This test is taken by the majority of high school graduates. According to the OECD report on Higher Education in Chile (see discussion in Section 2.1): "Even though it is not necessary for entry to technical and certain professional institutions, virtually all school-leavers take the PSU test." One explanation is that employers use PSU test results as (additional) signals of quality. Thus high school graduates take the test even if they do not plan on entering tertiary education, but instead try to find a job.

This measure of partner quality is particularly relevant because it captures (at least) three important aspects: the "consumption value" of having a smart partner, the earnings potential and intergenerational effects on the offspring.

3 Descriptive statistics

As discussed in the previous section, we have administrative data on the full sample of test takers in 2001 and 2002 who have submitted a valid application, i.e. they have scored above 450 at the university entrance test and have listed at least one valid choice in their preference listing of university-program combinations. This sample of individuals contains some individuals who were already married (or had kids) before having taken the test (3.5% of the sample). We drop these individuals, since their spouses'/partners' quality can not be affected by whether the individual gets into the better university/program or not.[6]

Individuals can (and do) take the PSU test several times. In our estimation we only use individuals that take the test for the first time.

[5] As discussed above, people also take the test for some technical/professional institutions or simply to use this as a signal for prospective employers.

[6] Including these individuals in our analysis does not change the results (results from the authors upon request).

The final data set that we are using in our analysis is constructed as follows. First, the objectives of our analysis dictate that we can only work with individuals who were married or had a partner before May 2012 (which is the date at which we received the merge of our "main" individuals from Registro to have information about the identify of the partner). Notice that students take the admission test at the age of 18 or later (very few at age 17 and the majority between ages 18 and 20). Since our data refer to the tests that were administered in the years 2001 and 2002, it thus follows that in 2012 individuals are around 29 or 30. Of course, not all individuals have entered yet a stable partnership at this age. Therefore, our sample consists of individuals who have entered a partnership up to age 30.[7]

Table 1 shows that roughly a fifth of the males (20.3%) and more than a fourth (27.3%) of the females that have applied for university in the years 2001 and 2002, are married in 2012. Since a non-negligible fraction of individuals have their first child before being married (see footnote above), we also merge individuals based on having a child together and classify them as "Any Partner". If we take into account individuals who are either married or have a child together, then more than a third (36.5%) of the men have a partner until age 30 and almost half (45.2%) of the women (see third row, "Any Partner", in Table 1).

Unfortunately, we are not able to match all individuals who have a partner, that is some partners are not in our data set and we thus do not observe their quality. In particular, we have access to quality measures only for those individuals ("partners") who have taken the admission test at some point between 2000 and 2007. Thus, if the spouse/partner of an individual has either never taken the test or has taken it sometime before (after) the year 2000 (2007), we do not have any information about his/her characteristics.

From Table 1 we see that 17.7% of all males applying for college in 2001/02 have a partner that appears in our data set. This means that we find the partners of close to 50% (0.484) of all married men. For women the corresponding figure is 0.367. This difference in the observability of the partner for men versus women is due to the fact that the average age of first marriage is higher for men than for women. Since our data for the university admission test span the period from the year 2000 to the year 2007, it follows that we can observe the quality of younger partners (i.e. of individuals who take the test after 2001/2002, which is true for the majority of partners of men unless these female partners did not take the entrance test at all) but not of older partners (i.e. for those who took the test before 2000, which can be a problem for women whose partners are more than two years older).

Since the sample of individuals that we are able to match with their partners constitutes only a subset of the population of students who have applied for university, the question arises whether the selection into our sample is symmetric around the entry threshold. For example, the entry into a better university-degree program is likely to change an individual's career opportunities and this might in turn affect

[7]Note that in Chile the average age at which women have their first child was 23 in the relevant period (23.14 in 2007), while the average age of first marriage of women is actually several years later, that 27.7 (according to the National Institute of Statistics (Instituto Nacional de Estadsticas INE) of Chile).

her/his decisions regarding marriage and children. Of course, the impact of being on one or the other side of the threshold depends on the type of the individual and so it is possible that the individuals to the right of the threshold who choose to get married at a young age differ from their counterparts on the left of the threshold. Moreover, it is also conceivable that having a partner that appears in our data correlates with some unobserved characteristics of the individuals.

This raises the concern of bias in our results, that is we might be worried that finding a jump at the threshold in the quality of an individual's partner is not due to attending the better university-program, but instead reflects the difference in the composition of the samples on the two sides of the threshold. We will discuss each of these concerns in detail in Section 5.2.2 and provide evidence that these concerns are not important and not driving our results.

Of course our results are only valid for the population of individuals who have found a (stable) partner until age 30 (and who we could match). For that reason, we present descriptive statistics on individual and family background characteristics in Table 2 for three different samples: firstly, for the full sample of test takers with valid applications (as discussed above) (see Columns (1) and (2)), secondly for the (sub)sample of those individuals who have a partner or spouse (see Columns (3) and (4)) and thirdly for the (sub) sample of individuals that we can match to have information on their spouses (see Columns (5) and (6)).

Table 2 shows that individuals who have a partner until age 30 are slightly less likely to be male (since men marry and have children later), while those individuals that we can match are slightly more likely to be male than in the full sample (since we are more likely to find younger partners than older partners, as described above). The individuals are relatively similar in terms of age across the three samples (slightly older in the "partner" sample, while women are slightly younger in the "matched" sample).

Furthermore, the individuals that have a partner seem to be slightly negatively selected (compare Columns (1) and (3) for women and Columns (2) and (4) for men). They are from worse backgrounds, in that they are slightly less likely to have an educated father or mother, they are less likely to have a father or mother in top occupations, [8] and attended worse high schools (as measured by the average university entrance test score of their high school peers). These individuals with partner also score lower at the PSU test and get into university- programs in which peer quality (measured in terms of average PSU score) is lower. As an aside, Table 2 shows that men score better at the PSU test than women (and are in programs with slightly higher peer quality). This has to be seen in the context that in the PISA test in 2006, Chile was the country with the largest gender difference in favor of boys in math performance.

One possible explanation for the fact that individuals with partners are slightly negatively selected

[8]The top two occupation categories include manager, senior administrative, large industrial, commercial or agricultural employer (over 50 employees), high bank executive, senior officer Armed Forces and Police, high Judicial Member and Diplomat (top category) and professional with five or more years of college (second category) (complete list from authors upon request). The third category consists of –for example– specialized employee or civil servant, Armed Forces Officer and Police, professional or technician with less than five years of college and medium industrialist and merchant.

lies in the fact that for highly able individuals the opportunity cost of an early investment in a family/partnership is high. Moreover, for them the incentives to formalize an existing informal partnership (through marriage and/or a child) is lower since in their case the reduction of their mating chances that is due to the age related deterioration of their quality is compensated and probably outweighed by the increase in their economic value. Thus, they not only stay attractive, but might actually become more attractive in the marriage market and thus for them the value of waiting is higher.

Individuals that we can match, on the other hand, are from slightly better backgrounds than individuals from the overall population (compare Columns (5) and (1) for women and Columns (6) and (2) for men in Table 2). The fact that matched individuals constitute a positive selection both from the overall population and from the set of individuals who do have a partner is easily explained by the fact that we only observe partners that have taken the test. Thus in the set of matched individuals we do not observe those that have a bad partner and individuals with bad partners are likely not to be good themselves.

Lastly, with respect to their partners, matched individuals score higher at the PSU test because they themselves are all good enough to have submitted a valid application for some college (as discussed in Section 2.1 individuals need to score at least 450 points at the PSU test to be able to apply). Partners instead may also belong to the set of individuals who have taken the test but have performed too poorly in order to apply for college.[9] An analogous point can be made to explain the difference between the variables "peer quality" and "high school quality". While both measures are based on the performance at the PSU test, peer quality averages over scores of individuals who had high enough scores to pass the minimum threshold (450) and to get accepted into one of her choices. High school quality on the other hand averages over PSU scores of individuals from the same high school who took the PSU test (but who did not necessarily score above the minimum threshold).

Table 2 shows that individuals are accepted –on average– into their second choice. This implies that we have about twice as many "usable" observations as individuals. For example, an individual that was accepted into her third choice (and is thus waitlisted for her first two choices) will appear in the sample three times: once to the right of the threshold for the university-program to which she was admitted and twice to the left of the thresholds for the two university-programs (which were her first two choices) to which she was waitlisted. Of course this implies that observations are not independent and we thus cluster standard errors at the individual-level in all specifications.

4 Empirical Strategy

Estimating returns to the quality of education poses the following challenge: Individuals who get into better universities have higher test scores.

[9] As discussed in Section 2.1 the large majority of individuals of each cohort take the PSU test, even if they do not plan on enrolling in some tertiary education institution, since employers value the PSU score as a signal of quality and/or people keep the option of entering higher education later in life.

At the same time, there is a positive correlation between individuals' test scores and outcomes such as their labor market earnings or their spouses' quality. Thus, it is not clear whether there is a causal effect of "going to a better university" or whether people at better universities simply have better outcomes because they themselves are of higher ability.

Figures 1 and 2 show that there is a positive correlation between individuals' test scores and their spouses' test scores (for women and men, respectively).

We address the challenge of estimating the causal effect of getting into a higher ranked university using a regression-discontinuity approach. We exploit the fact that Chilean students' ability to choose a university-major combination depends solely on their score which is an average between the score on the national university entrance exam and the high school grade. After obtaining their score, students with a minimum score of 450 points (on a 0 to 800 scale) submit a preference ranking over up to eight university-major combinations they wish to enroll in. The allocation of students to university-programs is carried out via a nationally centralized process that honors higher scoring students' requests subject to pre-established slot constraints.[10] This gives rise to cutoff scores which we set equal to the score of the student that fills the last slot in a given university-program.[11]

This yields a large number of quasi-experiments: students with scores close to the cutoff score can be expected to be very similar, but they are treated differently depending on whether their score is just above or just below the cutoff score. The treatment effect can therefore be measured by comparing the outcomes of the individuals in the upper neighborhood of the threshold with the outcomes of individuals in the lower neighborhood of the threshold.[12] In order to exploit all 1556 cutoffs (we observe the cutoffs for 778 university-programs for two years), we pool all data after normalizing the scores of applicants by the cutoff scores.

The outcome of interest is the quality of the spouse of an individual. We use PSU test scores to measure spousal quality.

Figure 3 shows that we are working with a sharp regression discontinuity design. People with scores below the threshold (i.e. the normalized score, defined as score minus cutoff for each program/year, is negative) are waitlisted, people with scores above the threshold (i.e. positive normalized score) are accepted.

We estimate the following equation.

$$y_{ij} = \alpha_j + \beta \mathbb{1}_{\{s_{ij} \geq 0\}}(s_{ij}) + \delta s_{ij} + \gamma s_{ij} \mathbb{1}_{s_{ij} \geq 0}(s_{ij}) + u_{ij}. \tag{1}$$

Here y_{ij} indicates the quality of the spouse (as measured by the PSU score) of individual i who appears on the application list of the university-program combination j. Since individuals can apply to multiple university-program combinations, a given individual i may appear multiple times, each time associated

[10] The setting gives students incentives to truthfully reveal their preference rankings.

[11] Note that scores are measured on a scale between 0 and 800 with two digits, thus the forcing variable is 'almost continuous'.

[12] For an overview of the RD design, see Hahn, Todd, and van der Klaauw (2001) and Imbens and Lemieux (2008).

with a different j.[13] s_{ij} is the admission score of individual i for the university-program combination j, normalized by the cutoff admission score of the university-program combination j. This variable assumes a negative value if and only if the individual's admission score falls short of the cutoff score for program j. $\mathbb{1}_{s_{ij}\geq 0}$ is an indicator function that assumes the value 1 if and only if s_{ij} is positive, i.e. exactly when individual i is admitted to program j.

The interpretation of the above equation is straightforward. An individual's admission score not only determines whether or not he is admitted into the program, but is also a measure for the individual's quality. Since one would expect that higher quality individuals match with higher quality partners we should allow partner quality to depend directly on the individual's admission score. In our equation we represent this dependence through the affine linear expression $\alpha_j + \delta s_{ij}$. We will discuss this linearity assumption in more detail below. The fact that the constant α_j is allowed to depend on the university-program index j, expresses the idea that average spousal quality might differ across programs.

Our hypothesis is that an individual's mating prospects change with the admission into a better program. Thus, we allow for the possibility that the spousal quality jumps at the admission threshold. In our equation we denote the size of this jump by β. In principle it is also possible that the functional dependence of partner quality on the individual's own quality changes at the threshold. In our equation this possibility is captured by the term $\gamma \mathbb{1}_{s_{ij}\geq 0}$. That is, γ measures the change in the slope of the relation between admission score and partner PSU.

For robustness we also estimate a version of the above model that is augmented by quadratic and cubic terms on both sides of the cutoff.

If individual i appears both on the list of applicants for the university-program combination j and on the list of applicants of the university-program combination k then it is reasonable to assume that the error terms u_{ij} and u_{ik} are correlated. We therefore cluster standard errors at the individual level.

5 Results

In this section we discuss the main results, i.e. the effects of going to a better university-program on women's and men's spouses/partners, and analyze the robustness of the results. Lastly, we present results on heterogeneous effects and provide suggestive evidence on the mechanisms underlying our main results.

We present results in two ways: firstly, we compute results based on the full sample using three different specifications. To control for the fact that we do not only use observations close to the threshold, we control for the relationship between outcome variable (spouse's quality) and individual's ability in a linear, quadratic and cubic form. The slope is allowed to differ to the right and left of the threshold.

[13] More precisely, applicants may appear multiple times on the lower side of a threshold, while they can appear only once on the upper side of a threshold.

Secondly, we estimate the effect of going to a better school using only observations in different windows around the threshold, where we control for individual's ability with a linear term (again the slope can be different on the two sides of the threshold).

Scores are normalized by the score of the person at the threshold, i.e. the score of the last person accepted into a specific university-program. The entrance test scores are measured on a scale from 0 to 800, but to be able to apply requires individuals to have score at least 450 on the PSU test. Normalized scores range between -260 and 270. In all specifications we control for program and year fixed effects. We always cluster standard errors at the individual level, since our observations are not independent (as discussed above).

In addition to estimating the effect of a better university-program for the full sample and controlling for individual's own score using a linear, quadratic and cubic term, we also estimate results using only observations around the threshold. We use two windows around the thresholds, +/-50 points and +/-25 points on a scale that ranges from 0 to 800 (i.e. less than 10% of the scale). It contains about 44% of observations (70% for the 50 window). This has to be seen in the following context: first, we estimate the jump for close to 800 (778) program thresholds for two years. Thus, for example, 3200 observations imply that we only have two individuals per threshold/year to estimate the jump. Secondly, as discussed above, the observations we have are not independent: If the individual is accepted in the n-th ranked alternative, the individual appears in the data set n times ($n = 1, ..., 8$). Therefore we cluster the standard errors again at the individual level.[14]

5.1 Main Results

In this section we analyze the effect of being admitted into a better university by comparing students to the right and to the left of the threshold in terms of different outcomes.

We explore the effect of going to a better university-program on the quality of the spouse as measured in terms of the performance on the national university entrance test, which is taken by the majority of high school graduates. This quality measure captures the consumption value of having a smarter spouse, earnings potential of the spouse and the impact on the quality of the offspring.

Table 3 shows results for women and men separately, estimated for the full sample for three different specifications. In particular, we control for the individual's score allowing for the slope to be different to the right and left of the threshold and using three different specifications: we control for the score with a linear term (Columns (1) and (4), for women and men respectively), a quadratic (see Columns (2) and (5)) and a cubic (see Columns (3) and (6)). In all three specifications we control for program and year fixed effects. As discussed above, we always cluster standard errors at the individual level.

Table 3 shows that women who are accepted into a better program (i.e. university-major combination)

[14] In a related setting (allocation of children to Romanian high schools) Pop-Eleches et al (2012) use a window of 2 points of 10-point scale, which contains half the observations of their dataset (which contains more than 1.8 million observations).

experience a significant jump in spouse quality compared to those who are on the waitlist (significant on 1%). Getting into a better university-program implies having a partner/spouse who scores around 9 points higher on the PSU test. This effect is sizable in magnitude: the increase is close to 2% of the average PSU score among spouses (around 560 points on a scale from 0 to 800) and around 0.1 in terms of standard deviations (around 110 points).[15]

Any assessment of the magnitude of the jump in partner quality has to take into account the fact that this jump just measures the implication of getting into a certain program or having to settle for the *next best* alternative. While it is likely that in some cases there is an important difference in terms of education quality, reputation, fit with one's abilities etc. between a program and the next best option, there are probably also other programs where these differences are hardly relevant at all. At the thresholds of these latter programs the jumps in partner quality will be small and this has implications also for the average jump that we measure. A correct judgment of the magnitude of the jump in partner quality therefore requires to set it in relation to the quality difference between the two relevant programs.

The only quality measure for programs that is available to us and that can easily be put in relation to our measure of partner quality is the average quality of the students that are admitted into the programs. In Section 5.3 we show that the difference in the average student quality is roughly 23 points (on a scale from 450 to 800). That is, on average a student that has just made it into a given program has a peer group that has an average test score that is 23 points higher than the peer group that he would have faced in his next best alternative. Relative to this 23 point increase of the 'program quality' the 9 point jump in partner quality appears very large.

The coefficient for women is extremely stable across the three different specifications. While the linear term that controls for individual's own score is (significantly) positive as expected in the presence of assortative mating (positive correlation between partners test scores/ability), the quadratic and cubic term are never significant (neither for women nor men). The slope to the right of the threshold is less steep (for men and women), but the difference is only significant in the first specification.

The coefficient for men on the other hand is positive but not significant. The coefficient is close to twice as large for women and the difference is significant on 10% for the first specification, where we control for a linear term.

In the following we present estimation results using windows of +/-25 and 50 around the threshold (i.e. less than 10% of the scale, as discussed above).

Table 4 shows the effect of going to a better university-program for the two window sizes for women (see Columns (1) and (2)) and men (see Columns (3) and (4)). Women who get into the better university-program experience a significant increase in spouse quality of more than 9 points (i.e. the increase is

[15] As discussed in Section 2.1, the "main" individuals in our sample have submitted a valid application and thus needed to have a PSU score of at least 450. The spouses on the other hand might not be among those who submitted a valid application, but among test takers who might have scores below 450. For this reason, the average score of spouses is substantially lower (and the standard deviation higher) than for the sample of test takers with valid application.

equivalent to around 2% of the average PSU score among spouses and 0.1 in terms of standard deviations. The coefficient for women is extremely similar in size compared to the estimation using the full sample (see Table 3 and discussion above).

For men, estimating the impact of a better university/program in a window around the threshold, the effect is now also significantly positive, but slightly smaller than the effect for women. Men experience an increase of 7 points in terms of their spouses' quality.

Lastly, we show results graphically for the small window size (+/-25). Figures 4 and 5 illustrate (for women and men, respectively) the effect of going to a better university-program for women and men. We display a scatter plot, where each dot represents 200 individuals (i.e. the average of their normalized score on the x-axis and the average over their spouses' PSU score on the y-axis) and the fitted line to the right and left of zero (the normalized threshold).

5.2 Robustness Checks

5.2.1 Standard Checks

First, we conduct a test for manipulation (McCrary test). We test whether there is a jump in the density of people to the right of the threshold, which one would expect if people were able to manipulate their scores in order to gain access to the programs they are interested in.

Figure 7 shows the distribution of people to the left and right of the thresholds (for women and men, respectively) using a normalized score (i.e. distance to the threshold for each program/year), so that thresholds are all set to zero. There is less mass overall to the right of zero, since there are more people on the waitlist than accepted for each program. We include a red line at the threshold (zero) as a visual aid. The figure shows no evidence of manipulation.

Second, we test the continuity assumption that is necessary for the application of the RD-design. We show that there are no jumps in individuals' characteristics such as family background at the threshold. This is also a test for manipulation, since –for example– having more individuals of higher socio-economic class immediately to the right of the threshold would suggest the existence of manipulation.

Table 5 presents results for eight different measures of individuals' characteristics, the quality of high school that the individual attended (measured in terms of the average PSU score of people who went to the same high school), having a father/mother with at least high school, having a father/mother with at least some college, having a father (mother) whose occupation is in the top two (three) categories and having a mother who is a housewife (for a detailed description of the variables, see Section 3).

The estimation is based the same specification and windows as the main results (compare Table 4). In particular, we display results for windows of +/-50 and 25 points and estimate the coefficient on a dummy that captures whether the individual scored above the threshold, while controlling for program and year fixed effects and clustering standard errors at the individual level.

Table 5 shows that coefficients are close to zero (and always insignificant) for all three background measures and for both women and men, thus lending support for the continuity assumption.

5.2.2 Concern of Sample Selection

The results that we have derived in the previous section are based on a sample that constitutes a selection of the overall student population. As discussed in Section 3, our data are constructed as follows. First, the objectives of our analysis dictate that we can only work with individuals who had a partner until 2012. Since our data refer to the university entrance tests that were administered in the years 2001 and 2002, individuals are around 29 or 30 and not all individuals have entered yet a stable partnership at this age. Therefore, our sample consists of individuals who have entered a partnership up to age 30 (which is true for almost half of the women and more than a third of men). The second form of selection that our sample is subject to, is due to the fact that we are not able to match all individuals who have a partner, that is some partners are not in our data set and we thus do not observe their quality.

These two forms of selection raise the concern of bias in our results, i.e. we might be worried that finding a jump at the threshold in the quality of an individual's partner is not due to attending the better university-program, but instead just reflects the difference in the composition of the samples on the two sides of the threshold.

To test if our results might be driven by selection we perform four sets of tests. In the first test we check whether (at the threshold) there is a jump in the probability of getting married/having a partner. If on the two sides of the threshold different types of individuals select into partnerships, then this should also imply a difference in the probability of being in a partnership for the following reason: The only way the partnership probability could be the same on either side of the threshold would be that the differences in the probability of entering a partnership across different types of individuals cancel each other out. We address this possibility in our second test, in which we analyze whether there is a jump in individual characteristics at the threshold for the subsample of people who have a partner. If different types of people select into partnership, one should see a jump, for example, in terms of the fraction of people who have an educated father to the left and right of the threshold. These two tests thus provide evidence on whether different types select into partnership to the right and left of the threshold.

The third and fourth tests are analogous but refer to our subsample of matched individuals: we first test if there is a jump in terms of the probability that we have information on the partner (to match the individual with the information on the partner). Second, we test if there are differences in the types of people who we can match to the right and left of the threshold.

Table 6 shows the results of the first test, in which we test whether there is a jump (at the threshold) in the probability to have a partner. In the first two columns of the table we present coefficient estimates on the dummy "normalized score above zero" for women based on the same regression specification as for the main results, i.e. linear spline and program/year fixed effects. The first column refers to a window

of +/-50 points and the second column refers to a window of +/-25 points. The remaining two columns show the same information for men. As can be seen none of the estimates are significantly different from zero, which is not due to large standard errors but to the fact that all coefficients are very close to zero.

The results presented in the above table already suggest that a differential selection into partnerships is rather unlikely. To provide further evidence, we investigate in our second test if there are differences in the composition of the sets of individuals who live in a partnership to the right and left of the threshold.

Table 7 presents results for this second test for eight family background variables, that is the quality of the high school that the individual attended (measured in terms of PSU score of people who attended the same high school), having a father/mother who has at least a high school degree, having a father/mother with at least some college, having a father (mother) whose occupation is in the top two (three) categories and having a mother who is a housewife (for a detailed description of the variables, see Section 3). Again we estimate coefficients on the dummy "normalized score above zero" based on the same regression specification as for the main results and use observations in two different window sizes around the threshold (Columns (1) and (3) refer to +/-50 points and (2) and (4) to a window of +/-25 points).

Table 7 shows that except for two instances (out of 16, i.e. 8 characteristics for men and women), none of the coefficient estimates are significantly different from zero and all coefficients are small in magnitude (for example, for high school quality the coefficient is around 1 point on a scale of 0 to 800 points). The two coefficient that are significant are in fact negative, that is on the right side of the threshold women are less likely to have a father who is at least high school educated and men are less likely to have a mother who is high school educated. In other words, to the right of the threshold individuals from "worse" background marry (compared to people to the left), which is very unlikely to explain a positive jump in partner quality when gaining access to a better university-program. If anything, this could imply that we underestimate the impact of getting into a better program.

Since the prevalence of individual characteristics does not change as we move across the threshold, this lends further support to our claim that our sample is not tainted by differential selection into partnership (or –if anything– individual characteristics who get married until age 30 are slightly worse to the right of the threshold).

We now turn to question whether there is any differential selection from the set of all individuals who are in partnership into the set of individuals that we are able to match with their partners. Again we proceed in two steps: first we analyze whether at the threshold there is a jump in the probability that an individual's partner can be found in our data set and we compare again the composition of the sets of matched individuals on the two sides of the threshold.

Table 8 illustrates that there is no jump at the entry threshold in terms of the probability to find (and match) the individual with the information on his/her partner in the sample of individuals with partners. All coefficients are small and statistically not significant. In the same table we also report how the probability to find in the full sample an individual to whom we can match a partner changes at the threshold. Given our preceding observations it should come as no surprise that also for this variable we

find no relevant jump.

Table 9 shows that also the composition of the set of matched individuals with respect to several observables is basically the same across the entry threshold (again with two exceptions out of 16, which show that men to the right of the threshold are less likely to have a college educated mother and less likely to have a father in the top two occupation categories).

To conclude, in this section we have shown that there is little evidence of differential selection into partnership nor into being matched (and thus being in our sample) as we move across the threshold. The only instances in which we find significant differences suggest that individuals to the right of the threshold are in fact from lower socio-economic status backgrounds, which can hardly explain a positive jump in partner quality, while suggesting that our results might be an underestimation of the true effects.

5.3 Further Results: Heterogeneous Effects and Mechanisms

5.3.1 Social Implications of a Vertically Differentiated University System

The implications that a vertically differentiated university system has on the marriage market outcomes of individuals, are of utmost importance also from a social point of view. The fact that the university system influences who marries whom, means that it has implications for the degree of assortative mating that characterizes the society. The degree of assortative mating in turn is one of central determinants of household inequality and social mobility. In this section we will provide some more direct evidence on these social implications.

So far we have shown that an individual who gets into the better university-program finds a partner of significantly higher quality than a very similar individual who just missed the threshold.[16] In the following we will analyze whether the magnitude of these returns differs for individuals from different social backgrounds. We measure social background in terms of parental education and occupation (we have data on both fathers and mothers of each individual taking the admission test) and by whether the mother works or not (more than 50% of mothers are housewives, even in this sample of individuals going to college).

Table 10 presents results on how the effect of getting into a higher ranked university differ by social background. We present the coefficient on being to the right of the threshold for women from 'high' and 'low' socioeconomic background.

We find that for women from a higher socioeconomic background, partner quality is already higher independently of getting into the better university. For example, women whose father went to college have a partner who scored 13 points higher on the admission test than women whose father did not attend college (see Table 10). In addition, returns in terms of partner quality are two to five times larger for women from higher socioeconomic background compared to those from lower background. For

[16] As discussed in the data section, we have dropped individuals who were married before taking the entrance exam.

example, women whose father went to college experience returns of more than 17 points in terms of their partner's quality (significant on 1%) compared to a return of 3 points (not significant) for women whose father did not attend college (the difference is significant on 1%). Similarly, women whose father is a worker experience significantly smaller returns (-2.5 versus 12) than women whose father is not a worker. The results point in the same direction when conditioning on mother education or occupation, but are slightly less strong. Thus, returns for women from high socioeconomic backgrounds are sizable in magnitude: the increase in partner quality is up to 4% of the average PSU score among spouses and around 0.2 in terms of standard deviations.

Table 10 shows that also men from higher socioeconomic backgrounds have partners that are of substantially higher quality. For example, men whose fathers went to college have a partner who scores 26 points more on the admission test than men whose father did not attend college. Similar results are obtained for other measures of socioeconomic background: men whose fathers (mothers) have a high school degree experience a return of 7.9 (8.4) compared to those from families without high school (5 and 6.4, respectively). Interestingly, for men one of the most important aspects for high returns is the occupation of the mother (while it matters relatively less for women). While for women the difference between having a mother with a top three occupation versus those who do not is the smallest of all differences, for men this difference is among the largest (2 points but not significant).

To conclude, it is not only the case that individuals from higher socioeconomic backgrounds have 'higher quality' partners independently of whether they get into the higher ranked university or not. In addition, these individuals also experience significantly larger returns in terms of partner quality to getting into the higher ranked university. From a social point of view this means that the vertical differentiation of the higher eductiaon system exacerbates the degree of assortative mating in the society. It thus also contributes to a higher degree of household inequality.

If the offspring of families from a high socioeconomic background experience higher returns to elite education, this also implies that such families have a stronger incentive to make ex ante investments that increase the chances of their children to get into higher ranked programs/universities (e.g. private schools, private tutoring for the admission test and so forth). From a social point such investments constitute a further - more indirect - channel through which a vertically differentiated education system amplifies existing inequality.

5.3.2 Suggestive Evidence on Mechanisms of Returns to Getting into a Higher-Ranked University

Where Did Partners Meet?

There are (at least) two different mechanisms by which getting into a higher-ranked university can affect the quality of one's partner. On the one hand, getting into a higher ranked university makes an individual more attractive for potential partners (since this is a signal of higher ability and social status and of higher potential in terms of success in the labor market). On the other hand, one can think of universities as

meeting places for young adults during a time in which many partnerships are formed. To put it in an extreme form, since an individual got into a higher ranked university and this is a place where partnerships are formed, she/he happens to (randomly) match with a smarter partner. We expect both channels to play a role, but are interested in the relative importance.

In the following we will present evidence on the importance of these two channels. Table 11 presents summary statistics on whether an individual and his/her partner went to the same high school, university or even university-degree program. In cases where individuals switch universities, we take into account all universities that an individual has (ever) attended to see whether she might have met her partner at one of those universities.[17] Of course we do not know if the couple actually met at these places (high school, university, university-degree program), but we will get an upper bound for whether couples might have met at these places or not, i.e. for the importance of the second channel of "universities as meeting places".

Table 11 shows that about 12% of couples went to the same high school. Surprisingly, only 14.5% of couples (ever) attended the same university (while 1.5% of couples had already attended the same high school). Less than 4% took part in the same degree program. These figures suggest that the second explanation of university as a meeting place (without making an individual more attractive) is unlikely to be driving our results, given that the upper bound for the fraction of couples who might have met at the university the first time is 13%.

While the channel of "university as a meeting place" does not appear to be the main (and definitely not the only) channel, the pool of "high quality" potential mates at university for an individual who just made it into the higher ranked university is of course larger than for the similarly smart individual who just missed the threshold. Therefore, we would expect that the individual at the lower ranked school is more likely to try to find a good partner outside university than the individual to the right of the threshold. We test this hypothesis in Table 12.

Table 12 shows that –as expected– there are significant jumps in the likelihood to be with a partner who went to the same university and in the likelihood of having been in the same university-degree program. For women the likelihood to have a parter in the same university increases by 7 percentage points if she gets into the better program, for men the likelihood increases by 6 percentage points. In terms of being with a partner who went to the same university-degree program, the jumps are around 5 percentage points. As a "placebo" test, we also show results for the likelihood of having attended the same high school. Not surprisingly but reassuringly, this likelihood is not affected by getting into the better university.[18]

[17] In the regression discontinuity analysis on the other hand, we only take into account the very first time an individual takes the entrance exam to avoid the problem that a specific type of individual around the threshold retakes the exam several times until she scores to the right of the threshold, while other types only try ones and remain to the left of the threshold.

[18] In principle, it would have been conceivable to find a negative jump for high school. One possible story could have been that those who do not get into the better university stay with their partner from high school, while those who get into the better program find a (new) partner at university.

In the following section, we want to analyze in which type of program marriage market returns are highest. While it is not possible to provide definitive answers about the channels leading to higher returns (because many things change, e.g. the social composition is different for university-programs at the top of the quality distribution versus for those at the bottom), we want to descriptively compare returns for programs to get some suggestive evidence on potential channels.

Program Classifications

We classify programs according to quality and size. We use two "objective" quality measures, the average score of the individuals who got accepted and the score of the individual at the 10th percentile of those accepted. As a "subjective" quality measure we analyze programs with the largest total number of people applying ("favorite" programs). In terms of size, we measure the number of accepted individuals into a program ("biggest" programs).

Since we are interested in how far marriage market considerations play a role in the application to specific universities and programs, we also create these measures separately by gender. For example, we classify the programs according to "top women" or "top men" programs (such as top program in terms of average score or 10th percentile of accepted women/men) and measure the number of women/men who were accepted (or who applied) for each program.

Table 13 displays results for the top halves of programs according to the four program classifications discussed above (in four different rows). The first two columns show results for the case in which the program classification is based on women and men jointly (e.g. the top program is determined by averaging over the scores of men and women who were accepted into the program) and the effect of getting into the better university-program on women (Column (1)) and men (Column (2)). Columns (3) and (4) display results for the case in which the program classification is based only on men (e.g. the top program is determined by averaging over the scores of accepted men), and the effect on women and men, respectively. Lastly, Columns (5) and (6) are based on program classifications using only women, again on women and men, respectively.

We show results based on the regression for the smallest window, +/-25, which we use in the estimation of the main results. Again we control for the score of the individuals with a linear term, where the slope is allowed to differ to the right and left of the threshold and we control for program and year fixed effect. Standard errors are clustered at the individual level.

We find that effects are particularly large for both women and men who just made it (or not) into top programs (measured in terms of average score of all accepted students) (see first and second row and first two columns of Table 13).

Similarly, there are large effects for the top programs measured in terms of 10th percentile of the score of accepted students, but there the effect seems to be stronger for women than men. Interestingly, for women the effect is largest for programs with very high scoring women, while for men the effects are

stronger for the best programs in general (based on scores of men and women together).

Men have particularly high returns in large programs and the effect is particularly strong for programs that have many women. Similarly, the effect for men is strong for "favorite" programs of women, i.e. to which many women applied. Women on the other hand, have high returns in programs to which in general many students apply.

In Table 16 we show the jumps in program quality (as measured by the average quality of the peers) that people experience when getting into the better university-program for the different subgroups of programs (see above). In particular, Table 16 shows that individuals in top programs (average score of accepted students) experience quality jumps of 27 points in terms of peer quality instead of 23 points (average quality jump over all programs and all students). Results are similar for top programs as measured in terms of 10th percentile. Thus large effects on partner quality for individuals in top programs are correlated with large jumps in peer quality in such programs.

For large programs (in terms of number of students accepted), on the other hand, the situation is different: quality jumps that men experience in such programs are of average size, while the quality jumps are even below average for men in programs with many women. At the same time, returns in terms of partner quality are particularly large for men in those programs. This suggests that finding a better partner is not only driven by getting into a higher quality program (in terms of average peer quality), but also by "market thickness".

For "favorite programs", the situation is similar for men: returns are large for men in programs to which many women apply, while quality jumps in these programs are of average size. Women have high returns in programs to which many men apply, but for these programs there are also large jumps in quality of peers.

6 Conclusion

In this paper we have estimated the returns of attending a higher ranked ("elite") university on marriage market outcomes. We thereby contribute to closing the gap that exists in the literature with respect to the relationship between university quality and outcomes such as partner and child quality. In particular, we are able to address the two major challenges that arise with respect to this question by exploiting unique features of the Chilean university admission system. The two challenges are the identification of the causal effect of university quality and having access to the necessary long-run data (i.e. being able to match former university students to their partners/spouses and being able to measure their "quality"). Since the Chilean system is based on a centrally administered entry test, it not only constitutes an ideal context for using a regression discontinuity approach to identify causal effects, but it also provides us with a quality measure for all applying students and their partners.

We find that being able to attend a higher ranked university has substantial returns in terms of partner

quality. While our estimates show that there are marriage market returns for both sexes, they also indicate that they are more pronounced in the case of female students. We also analyze how the returns vary with the students' background and how they differ for different types of universities-degree programs, such as –for example– the top programs, the large programs and so forth. We find that returns are highest for students in top degree programs, for men in programs with many women, and for students from higher socioeconomic backgrounds as measured by parental education and occupation.

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Appendix A

Figures

Figure 1: Correlation between the test scores of female students and the test scores of their partners

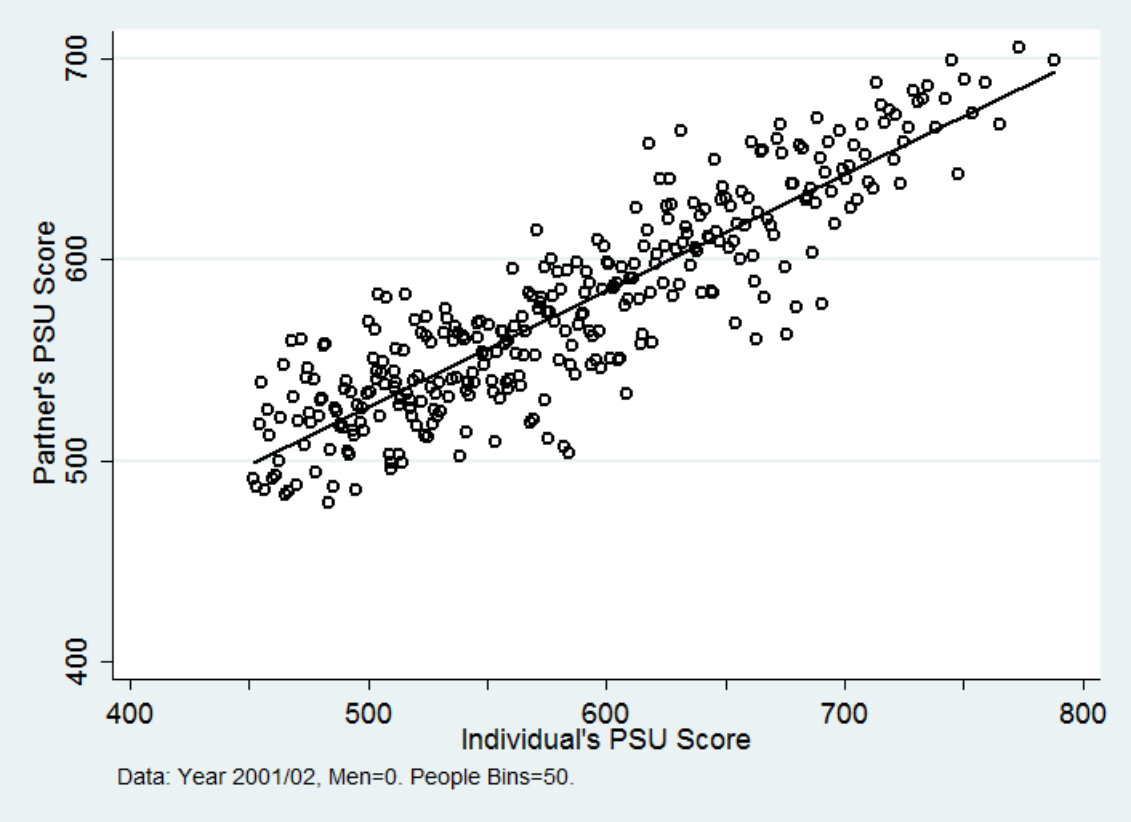


Figure 2: Correlation between the test scores of male students and the test scores of their partners

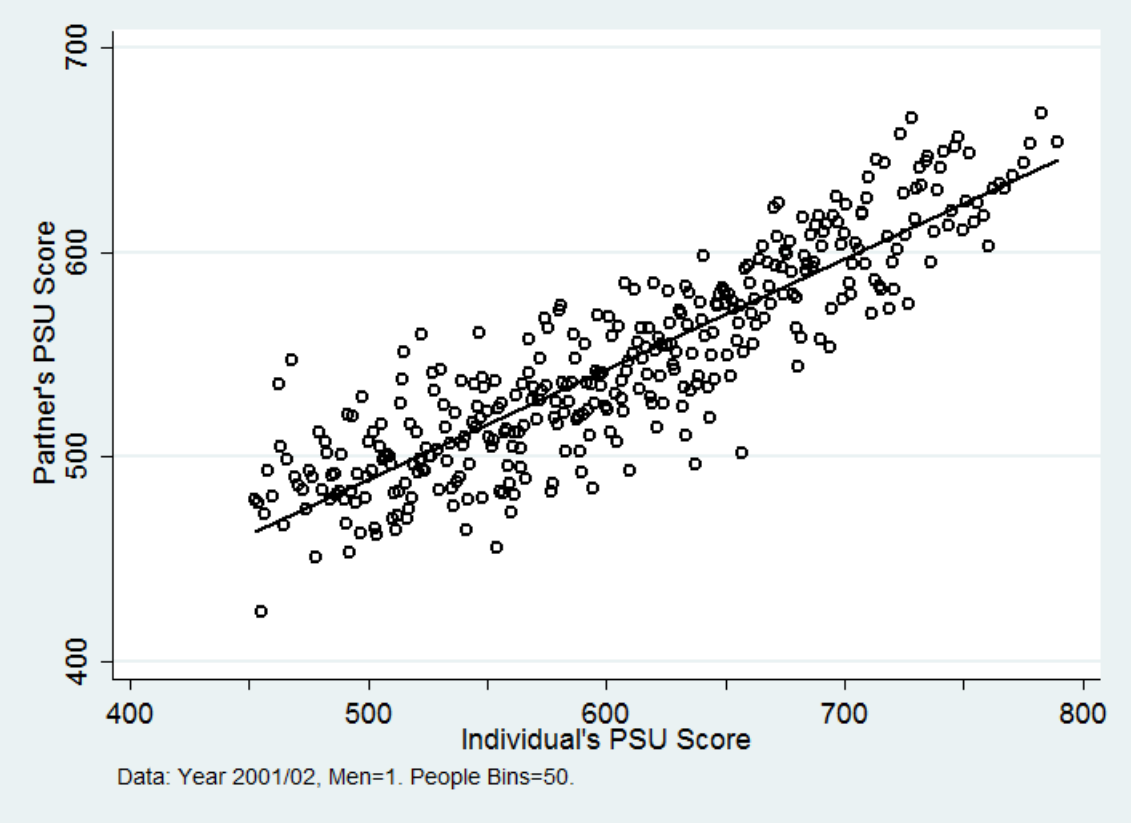


Figure 3: Sharp Regression Discontinuity Design: Students accepted and shortlisted to the right and left of the threshold

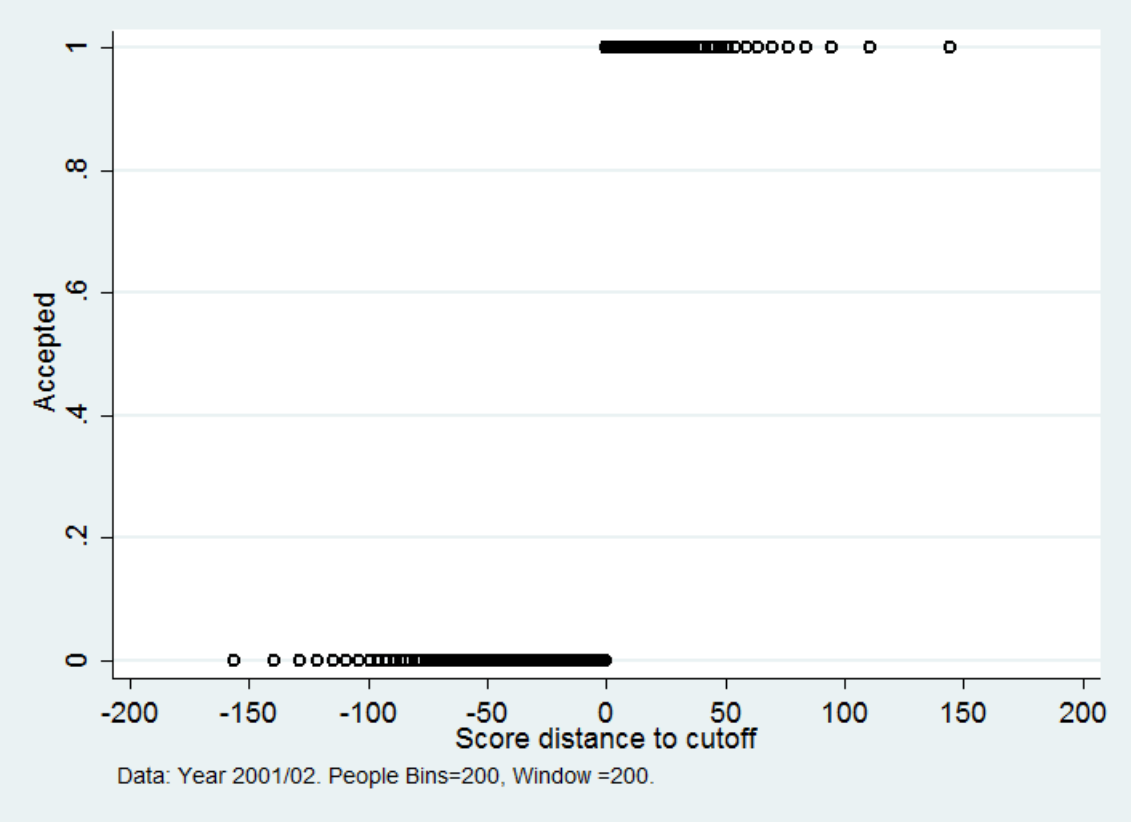


Figure 4: Jump in Partner Quality at the Threshold: Female students

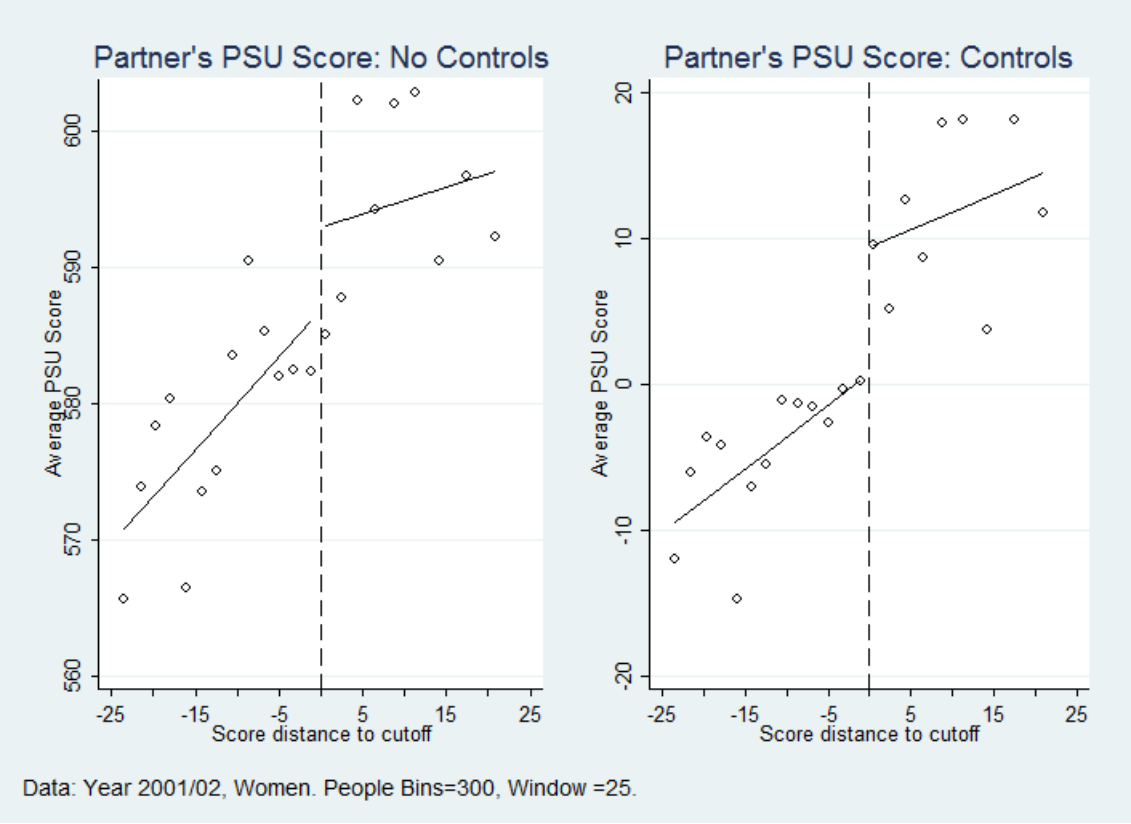


Figure 5: Jump in Partner Quality at the Threshold: Male students

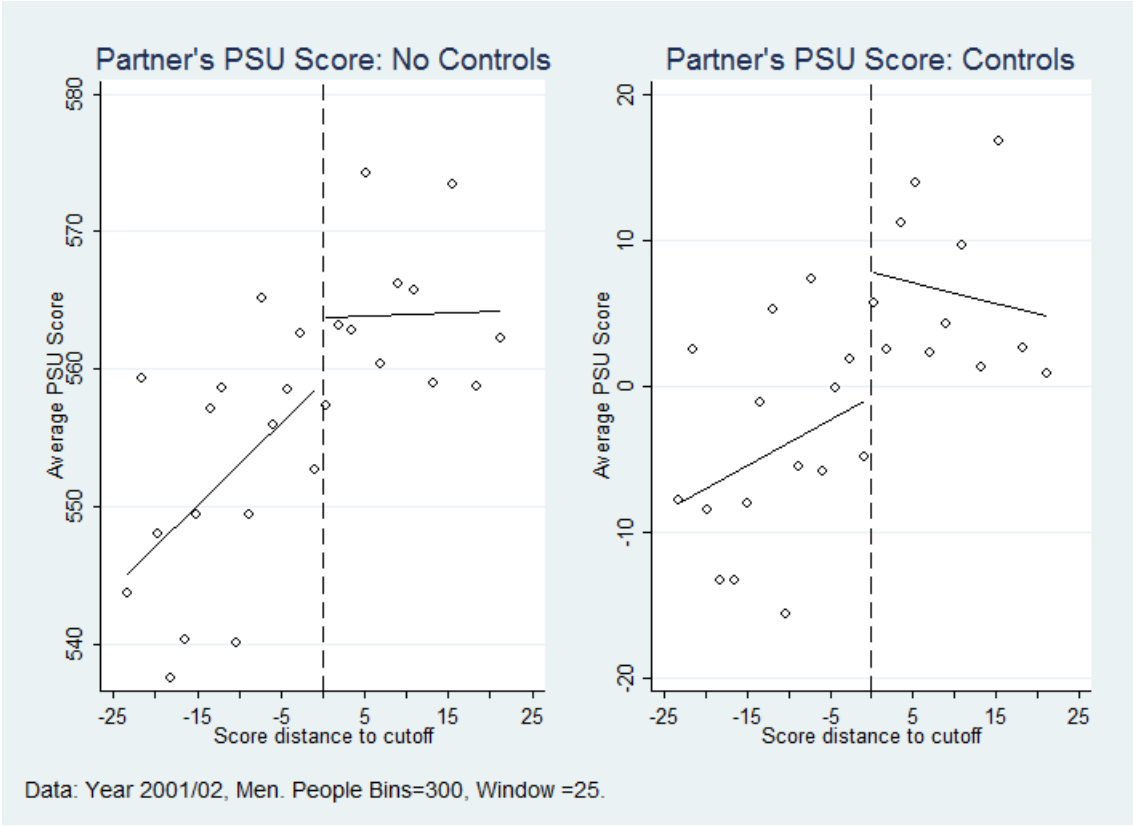


Figure 6: Jump in partner quality of female students whose fathers have some college education

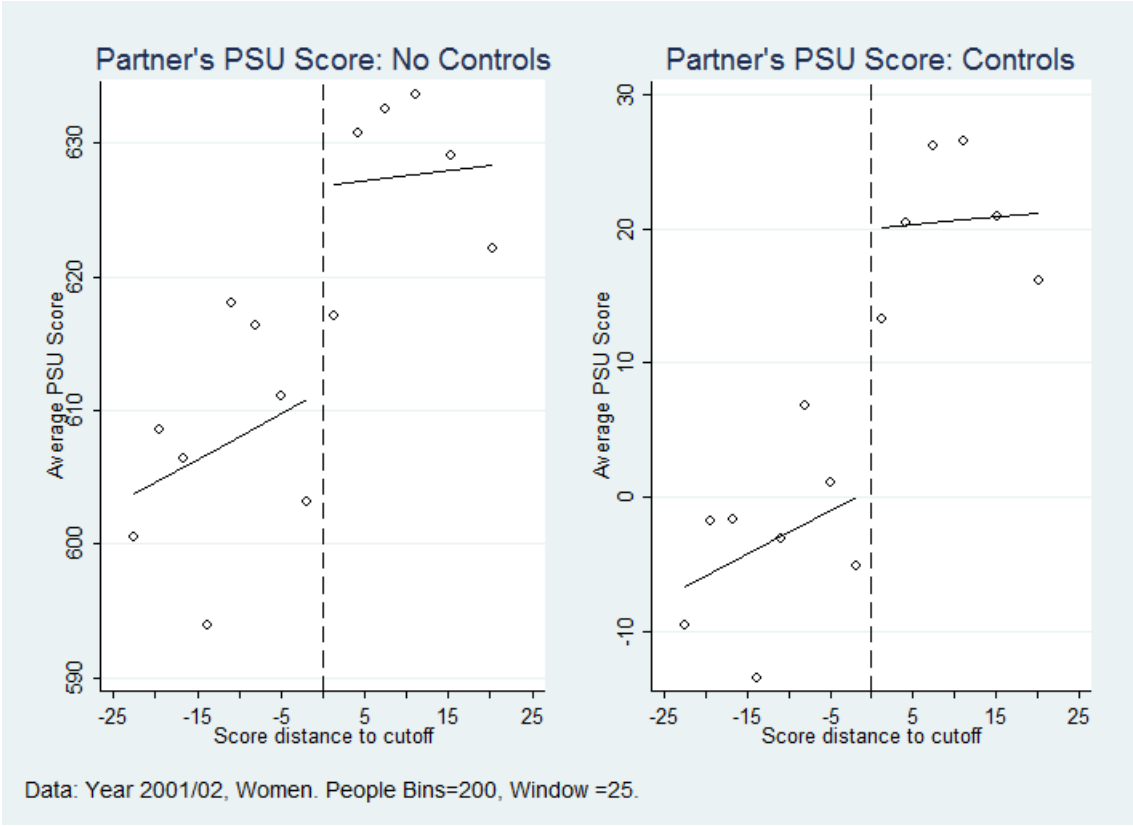
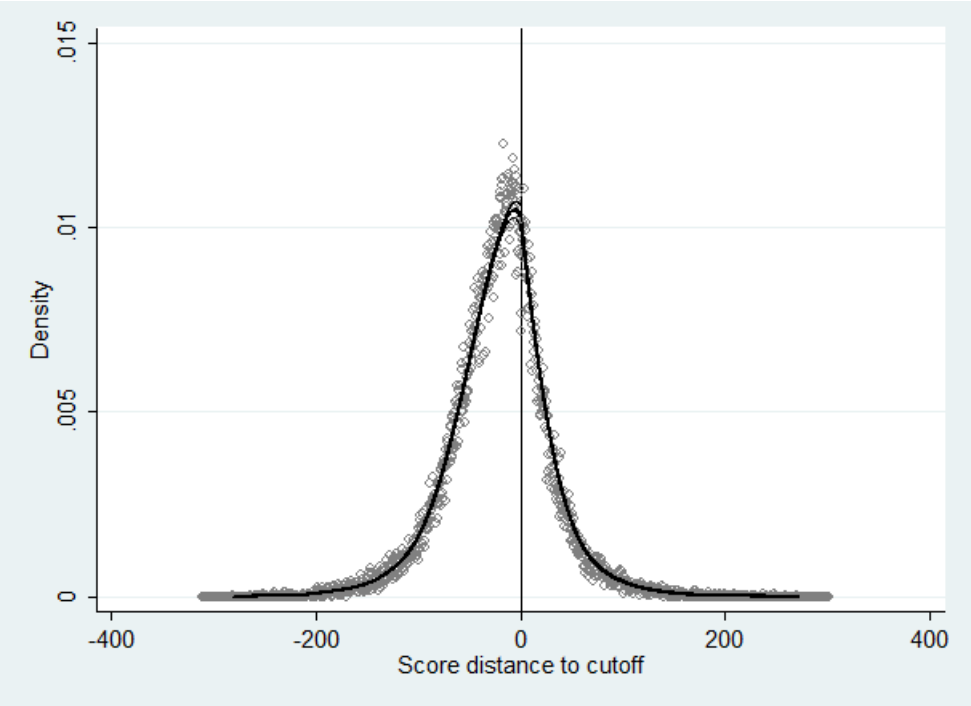


Figure 7: McCrary Density Test



Descriptive statistics

Table 1: Summary Statistics: Individuals and their partners

	Student Population		With Partner		Matched Partner	
	Women	Men	Women	Men	Women	Men
	(1)	(2)	(3)	(4)	(5)	(6)
Spouse	0.273	0.203	0.603	0.555	0.788	0.804
	(0.445)	(0.402)	(0.489)	(0.497)	(0.409)	(0.397)
Children	0.330	0.271	0.730	0.743	0.589	0.588
	(0.470)	(0.445)	(0.444)	(0.437)	(0.492)	(0.492)
Any Partner	0.452	0.365	1	1	1	1
	(0.498)	(0.481)	(0)	(0)	(0)	(0)
Matched Partner	0.166	0.177	0.367	0.484	1	1
	(0.372)	(0.381)	(0.482)	(0.500)	(0)	(0)
N	39301	45562	17779	16635	6521	8050

Table displays means and standard deviations in parentheses.

Data: Population, 2001/02

Table 2: Summary Statistics: Individuals' Characteristics

	Student Population		With Partner		Matched Partner	
	Women	Men	Women	Men	Women	Men
	(1)	(2)	(3)	(4)	(5)	(6)
Individual Characteristics						
Male	0.537		0.483		0.552	
	(0.499)		0.499		0.497	
Birth Year	1982.3	1982.0	1982.1	1981.6	1982.5	1982.0
	(1.823)	(2.161)	(1.923)	(2.339)	(1.347)	(1.832)
Father At Least High School	0.714	0.721	0.679	0.682	0.758	0.746
	(0.452)	(0.448)	(0.467)	(0.466)	(0.428)	(0.435)
Father Some College	0.391	0.394	0.354	0.343	0.429	0.421
	(0.488)	(0.489)	(0.478)	(0.475)	(0.495)	(0.494)
Mother At Least High School	0.718	0.712	0.677	0.668	0.761	0.735
	(0.450)	(0.453)	(0.467)	(0.471)	(0.427)	(0.441)
Mother Some College	0.318	0.310	0.283	0.263	0.348	0.330
	(0.466)	(0.463)	(0.450)	(0.440)	(0.476)	(0.470)
Father Occupation Top 2 Cat	0.346	0.340	0.328	0.311	0.355	0.357
	(0.476)	(0.474)	(0.470)	(0.463)	(0.479)	(0.479)
Mother Occupation Top 3 Cat	0.272	0.266	0.247	0.239	0.288	0.268
	(0.445)	(0.442)	(0.431)	(0.426)	(0.453)	(0.443)
Mother Housewife	0.500	0.512	0.523	0.538	0.497	0.523
	(0.500)	(0.500)	(0.499)	(0.499)	(0.500)	(0.499)
High School Quality	537.4	541.1	528.1	529.6	545.4	548.9
	(72.73)	(79.69)	(73.53)	(79.28)	(72.28)	(80.45)
University Admission						
PSU Score	593.4	613.7	582.7	603.3	600.5	622.6
	(81.84)	(83.58)	(81.98)	(84.33)	(83.34)	(85.95)
PSU Score Partner	584.8	554.1	584.8	554.1	584.8	554.1
	(113.4)	(109.8)	(113.4)	(109.8)	(113.4)	(109.8)
Peer Quality	622.4	630.1	614.2	621.2	627.8	636.6
	(66.24)	(66.99)	(67.11)	(67.93)	(67.97)	(70.13)
Accepted at Pref No	2.057	1.931	2.037	1.914	2.067	1.908
	(1.406)	(1.334)	(1.408)	(1.338)	(1.434)	(1.317)
N	39301	45562	17779	16635	6521	8050

Table displays means and standard deviations in parentheses.

Data: Population, 2001/02

Main result: Jump in partner quality

Jump in partner quality; full sample (not windows)

Table 3: Effect of getting into a higher ranked university-program on partner quality (as measured by university entrance test)

	Women			Men		
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{1}_{\{NScore\geq 0\}}$	9.185***	9.470***	9.488**	3.300	4.108	4.996
	(2.726)	(3.301)	(3.942)	(2.244)	(2.836)	(3.451)
N Score	0.366***	0.354***	0.342**	0.494***	0.410***	0.379**
	(0.049)	(0.091)	(0.157)	(0.044)	(0.090)	(0.163)
N Score $\times\mathbb{1}_{\{NScore\geq 0\}}$	-0.127*	-0.118	-0.091	-0.316***	-0.185	-0.209
	(0.073)	(0.149)	(0.261)	(0.060)	(0.130)	(0.230)
	(3.061)	(3.061)	(3.060)	(2.735)	(2.735)	(2.736)
N Score Squared		-0.000	-0.000		-0.001	-0.001
		(0.001)	(0.002)		(0.001)	(0.002)
N Score Squared $\times\mathbb{1}_{\{NScore\geq 0\}}$		0.000	-0.000		0.000	0.002
		(0.001)	(0.004)		(0.001)	(0.003)
N Score Cubic			-0.000			-0.000
			(0.000)			(0.000)
N Score Cubic $\times\mathbb{1}_{\{NScore\geq 0\}}$			0.000			-0.000
			(0.000)			(0.000)
N	16101	16101	16101	17940	17940	17940
R^2	0.226	0.226	0.226	0.236	0.236	0.236

Standard errors are clustered at the student level and displayed in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Data: Matched sample, 2001/2002. All specifications contain program and year FE.

Jump in partner quality; windows

Table 4: Effect of getting into a higher ranked university-program on partner quality: Windows around cutoffs

	Women		Men	
	W 50	W 25	W 50	W 25
	(1)	(2)	(3)	(4)
$\mathbb{1}_{\{NScore \geq 0\}}$	9.515***	9.047*	5.930*	7.485*
	(3.573)	(4.874)	(3.081)	(4.252)
N Score	0.313***	0.354	0.358***	0.405*
	(0.096)	(0.249)	(0.093)	(0.216)
N Score $\times \mathbb{1}_{\{NScore \geq 0\}}$	-0.073	-0.063	-0.219	-0.510
	(0.159)	(0.369)	(0.139)	(0.323)
N	11297	6865	13151	8198
R^2	0.255	0.300	0.256	0.295

Standard errors are clustered at the student level and displayed in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Data: Matched sample, 2001/2002. All specifications contain program and year FE.

Robustness

Robustness: Continuity assumption

Table 5: Population: Differences in observables

	Women		Men	
	W 50	W 25	W 50	W 25
	(1)	(2)	(3)	(4)
High School Quality	-1.238	-0.387	-1.152	-1.541
	(0.847)	(1.129)	(0.863)	(1.169)
Father ≥ High School	0.001	0.004	-0.001	-0.003
	(0.006)	(0.008)	(0.006)	(0.008)
Father Some College	-0.006	-0.008	0.001	-0.009
	(0.006)	(0.009)	(0.006)	(0.008)
Mother ≥ High School	0.003	0.007	-0.005	-0.010
	(0.006)	(0.008)	(0.006)	(0.008)
Mother Some College	-0.003	-0.003	-0.005	-0.010
	(0.006)	(0.008)	(0.006)	(0.008)
Father Occupation Top 2 Categ	0.003	-0.009	-0.002	-0.010
	(0.007)	(0.009)	(0.006)	(0.008)
Mother Occupation Top 3 Categ	-0.004	-0.009	0.001	0.001
	(0.006)	(0.008)	(0.006)	(0.008)
Mother Housewife	0.005	0.012	-0.002	-0.007
	(0.007)	(0.009)	(0.006)	(0.009)
N	30385	17951	27164	16684

Standard errors clustered at the student level and displayed in parentheses

Data: Population, 2001/2002. All specifications contain program and year FE.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Robustness: Selection

Table 6: Jump in the probability to be married and/or have a child

	Women		Men	
	W 50	W 25	W 50	W 25
	(1)	(2)	(3)	(4)
Outcome Variable				
Married	0.005	0.003	0.003	0.008
	(0.006)	(0.008)	(0.005)	(0.007)
Children	0.007	0.003	-0.001	0.002
	(0.006)	(0.009)	(0.006)	(0.008)
Any Partner	0.007	-0.000	0.001	0.008
	(0.007)	(0.009)	(0.006)	(0.008)
N	67698	40658	75062	46483

Standard errors clustered at the student level and displayed in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Data: Population, 2001/2002. All specifications contain program and year FE.

Table 7: Partner sample: Differences in observables

	Women		Men	
	W 50	W 25	W 50	W 25
	(1)	(2)	(3)	(4)
Outcome Variable				
High School Quality	-0.435	-0.793	-1.527	-0.876
	(1.273)	(1.697)	(1.425)	(1.966)
Father ≥ High School	-0.011	-0.023*	-0.004	0.005
	(0.010)	(0.013)	(0.010)	(0.013)
Father Some College	-0.003	-0.019	0.012	0.009
	(0.010)	(0.013)	(0.010)	(0.013)
Mother ≥ High School	0.002	0.007	-0.010	-0.029**
	(0.010)	(0.013)	(0.010)	(0.013)
Mother Some College	-0.001	-0.003	-0.007	-0.017
	(0.009)	(0.012)	(0.009)	(0.012)
Father Occupation Top 2	0.001	-0.013	-0.001	-0.012
	(0.010)	(0.013)	(0.010)	(0.013)
Mother Occupation Top 3	-0.003	-0.010	0.003	0.003
	(0.009)	(0.012)	(0.009)	(0.013)
Mother Housewife	-0.004	0.016	-0.004	-0.011
	(0.011)	(0.014)	(0.011)	(0.015)
N	30385	17951	27164	16684

Standard errors clustered at the student level and displayed in parentheses

Data: Partner sample, 2001/2002. All specifications contain program and year FE.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Jump in the probability to be matched (partner in sample)

	Women		Men	
	W 50	W 25	W 50	W 25
	(1)	(2)	(3)	(4)
Outcome Variable				
Partner Matched (cond on Partner Sample)	0.011	0.010	0.007	0.017
	(0.010)	(0.014)	(0.011)	(0.015)
Partner Matched (cond on Population)	0.007	0.005	0.003	0.008
	(0.005)	(0.007)	(0.005)	(0.007)
N	30385	17951	27164	16684

Standard errors clustered at the student level and displayed in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
All specifications contain program and year FE.

Table 9: Matched sample: Differences in observables

	Women		Men	
	W 50	W 25	W 50	W 25
	(1)	(2)	(3)	(4)
Outcome Variable				
High School Quality	1.671	0.450	-1.389	-1.217
	(2.004)	(2.720)	(2.027)	(2.822)
Father ≥ High School	0.006	-0.017	-0.003	0.015
	(0.015)	(0.021)	(0.013)	(0.018)
Father Some college	0.025	0.001	0.001	-0.009
	(0.016)	(0.023)	(0.015)	(0.020)
Mother ≥ High School	0.009	-0.007	-0.009	-0.019
	(0.014)	(0.020)	(0.013)	(0.018)
Mother Some College	0.014	0.006	-0.019	-0.036*
	(0.016)	(0.021)	(0.014)	(0.019)
Father Occupation Top 2	0.015	-0.021	-0.028*	-0.053***
	(0.016)	(0.022)	(0.015)	(0.020)
Mother Occupation Top 3	-0.003	-0.017	-0.008	-0.016
	(0.016)	(0.022)	(0.014)	(0.019)
Mother Housewife	-0.024	0.011	-0.002	-0.004
	(0.018)	(0.024)	(0.016)	(0.022)
N	11297	6865	13151	8198

Standard errors are clustered at the student level and displayed in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Data: Matched sample, 2001/2002. All specifications contain program and year FE.

Further Results: Heterogeneous Effects and Mechanisms

Social Implications of a Vertically Differentiated University System

Table 10: Effect of getting into a higher ranked university-program by socioeconomic background

	Women				**Men**			
Socioecon	Jump			Level	Jump			Level
Background:	*High* Coeff (SE)	*Low* Coeff (SE)	Diff (t-stat)	*High* Coeff (SE)	*High* Coeff (SE)	*Low* Coeff (SE)	Diff (t-stat)	*High* Coeff (SE)
Father								
High School	11.458**	3.012		8.690	7.901*	5.076		16.522***
	(5.179)	(6.331)	(1.436)	(5.396)	(4.437)	(5.632)	(0.564)	(4.712)
College	17.378***	3.098		13.206***	6.308	8.813*		26.968***
	(5.659)	(5.286)	(2.818)	(4.954)	(4.821)	(4.658)	(-0.573)	(4.415)
Occup Top 2	12.158**	7.723		10.062*	8.934*	8.455*		21.130***
	(5.851)	(5.244)	(0.849)	(4.921)	(4.999)	(4.601)	(0.107)	(4.298)
Not Worker	12.076**	-2.566		6.636	7.464*	8.809		16.335***
	(5.035)	(7.460)	(2.114)	(6.329)	(4.353)	(6.623)	(-0.223)	(5.731)
Mother								
High School	11.022**	2.992		9.473*	8.424*	6.421		20.450***
	(5.132)	(6.514)	(1.339)	(5.582)	(4.431)	(5.535)	(0.409)	(4.671)
Occup Top 3	9.758	8.851*		3.500	9.290*	7.286		19.253***
	(6.682)	(4.956)	(0.160)	(5.417)	(5.471)	(4.431)	(0.420)	(4.544)
Not Worker	10.211**	-7.850		7.638	7.595*	5.300		27.679***
	(4.929)	(11.987)	(1.535)	(10.792)	(4.279)	(11.493)	(0.204)	(10.302)
Not Housewife	12.061**	5.945		3.250	7.038	7.809		13.085***
	(5.645)	(5.360)	(1.192)	(4.695)	(4.823)	(4.754)	(-0.174)	

Suggestive Evidence on the Mechanisms

Where Did Couples Meet?

Table 11: Potential Meeting Place: Descriptive Evidence

	Women	Men
Individual and Partner		
Went to Same		
High School	0.120	0.121
	(0.325)	(0.326)
University	0.141	0.146
	(0.348)	(0.353)
(of which HS and Univ)	0.016	0.015
University-Program	0.036	0.038
	(0.187)	(0.192)
N	16101	17940

Table displays means and standard deviations in parentheses.

Data: Population, 2001/02

Table 12: Potential meeting place: Likelihood of having gone to the same university(-degree program)

	Women		Men	
	W 50	W 25	W 50	W 25
	(1)	(2)	(3)	(4)
Same High School	-0.006	-0.014	-0.003	0.006
	(0.011)	(0.016)	(0.010)	(0.014)
Same University	0.085***	0.070***	0.069***	0.060***
	(0.013)	(0.018)	(0.012)	(0.016)
Same University-Program	0.062***	0.053***	0.058***	0.056***
	(0.008)	(0.011)	(0.007)	(0.009)
N	7889	5240	9599	6509

Standard errors are clustered at the student level and displayed in parentheses.

All specifications contain program and year FE.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Data: Matched sample, 2001/2002.

Heterogeneous effects: Which type of programs exhibit high returns?

Table 13: Heterogeneous effects of getting into a higher ranked university-program

Criterium based on	All Students		Male Students		Female Students	
Effects on	Women	Men	Women	Men	Women	Men
Program Classification						
Top (Average Score of Accepted)	11.719*	11.340*	10.628	8.664	11.137	8.570
	(7.035)	(6.159)	(7.016)	(6.179)	(6.946)	(6.172)
Top (10th Perc Score of Accepted)	11.568*	7.938	7.982	5.245	12.600*	6.552
	(7.025)	(6.154)	(6.921)	(6.196)	(6.949)	(6.064)
Favorite (Number Applied)	13.225*	10.465	19.782**	6.804	7.221	19.492***
	(7.514)	(6.390)	(8.723)	(5.535)	(6.473)	(7.026)
Biggest (Number Accepted)	7.243	9.976*	9.337	8.276	6.550	15.006**
	(7.039)	(5.529)	(8.275)	(5.127)	(6.287)	(6.535)

Table displays coefficients on the dummy "above threshold" for regressions based on window size +/-25 points.

All specifications control linearly for own test score and contain program and year FE.

Standard errors are clustered at the student level and displayed in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix B

Jumps in the quality of university-program peers

Peer quality: full sample (not windows)

Table 14: OLS Regression: DV = Peer quality

	Women			Men		
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{1}_{\{NScore\geq 0\}}$	22.813***	22.559***	23.108***	22.057***	21.971***	23.822***
	(0.744)	(0.921)	(1.060)	(0.674)	(0.826)	(0.976)
Normalized Score	0.798***	0.803***	0.747***	0.811***	0.801***	0.630***
	(0.018)	(0.041)	(0.072)	(0.017)	(0.035)	(0.063)
N Score * $\mathbb{1}_{\{NScore\geq 0\}}$	-0.782***	-0.773***	-0.713***	-0.798***	-0.773***	-0.620***
	(0.019)	(0.043)	(0.076)	(0.018)	(0.037)	(0.065)
[1em] N Score Squared		0.000	-0.001		-0.000	-0.003***
		(0.000)	(0.001)		(0.000)	(0.001)
N Score Sq * $\mathbb{1}_{\{NScore\geq 0\}}$		-0.000	0.001		-0.000	0.004***
		(0.000)	(0.001)		(0.000)	(0.001)
N Score Cubic			-0.000			-0.000***
			(0.000)			(0.000)
N Score Cubic * $\mathbb{1}_{\{NScore\geq 0\}}$			0.000			0.000***
			(0.000)			(0.000)
N	9864	9864	9864	11952	11952	11952
R^2	0.924	0.924	0.924	0.928	0.928	0.928

. Standard errors clustered at the student level and displayed in parentheses. All specifications contain program and year FE.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Data: Matched sample, 2001/2002.

Note that individuals who are not accepted into any program are dropped here, since for them there is no measure of "peer quality".

Peer quality: windows

Table 15: OLS Regression: DV = Peer quality

	Women		Men	
	W 50	W 25	W 50	W 25
	(1)	(2)	(3)	(4)
$\mathbb{1}_{\{NScore\geq 0\}}$	22.511***	23.410***	22.751***	23.633***
	(0.892)	(1.125)	(0.845)	(1.075)
N Score	0.801***	0.785***	0.777***	0.711***
	(0.032)	(0.073)	(0.030)	(0.068)
N Score* $\mathbb{1}_{\{NScore\geq 0\}}$	-0.769***	-0.788***	-0.770***	-0.702***
	(0.035)	(0.080)	(0.033)	(0.073)
N	7889	5240	9599	6509
R^2	0.932	0.943	0.933	0.938

Standard errors are clustered at the student level and displayed in parentheses.

All specifications contain program and year FE.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Data: Matched sample, 2001/2002.

Note that individuals who are not accepted into any program are dropped here,

since for them there is no measure of ”peer quality”.

Table 16: OLS Regression: DV = Peer quality

Criterium based on	All Students		Male Students		Female Students	
Effects on	Women	Men	Women	Men	Women	Men
All Programs	23.410***	23.633***				
	(1.125)	(1.075)				
Program Classification						
Top (Average Score of Accepted)	26.899***	27.313***	26.873***	26.615***	26.379***	26.897***
	(1.396)	(1.352)	(1.390)	(1.359)	(1.370)	(1.356)
Top (10th Perc Score of Accepted)	26.147***	27.151***	25.922***	26.809***	26.089***	26.723***
	(1.426)	(1.370)	(1.350)	(1.386)	(1.439)	(1.331)
Favorite (Number Applied)	24.838***	23.496***	27.100***	24.611***	23.136***	22.981***
	(1.456)	(1.371)	(1.563)	(1.234)	(1.373)	(1.549)
Biggest (Number Accepted)	25.224***	23.845***	27.552***	24.968***	22.112***	21.624***
	(1.362)	(1.201)	(1.505)	(1.153)	(1.326)	(1.366)

Table displays coefficients on the dummy "above threshold" for regressions based on window size +/-25 points.

All specifications control linearly for own test score and contain program and year FE.

Standard errors are clustered at the student level and displayed in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix C: Further background information

Gender related facts:

- In recent years the make-up of the student population has been changing, with more female students, more older students and more who work part-time. Women made up 14.3% of undergraduates in 1990. By 2007 they accounted for 51% at universities (49% at CRUCH universities). Female undergraduates are more likely than males to be studying social sciences (13% v 6%), education (20% v 10%) and health (21% v 9%), and far less likely to be studying any technology related subjects (7% v 38%).

- In Chile, as in most OECD and EU countries, a significantly higher percentage of women than men successfully complete secondary education (77% compared to 69% in 2005, according to Education at a Glance). Thus more women than men obtain the school leaving certificate and meet the minimum entry requirement for non-university education. Similarly, more women than men enter for the PSU; 52.7% of entrants were female in 2006, 53.5% in 2007 and 53.9% in 2008.[19]

- Labor force participation among Chilean women is strikingly low. As noted in OECD's Economic Survey of Chile, during the period 1990-2003 male participation remained relatively stable at about 73%, close to the OECD average. Female participation, despite an increase of almost 10 percentage points during this period, reached just 42%. This is low by OECD and even Latin American standards. Also, unemployment is typically higher for females than males; the effective gender gap in labour force participation is higher still when part-time work is taken into account; and the gender-earnings gap remains sizeable, even among the best educated individuals.

Inequality facts:

- Over the period of 1990 and 2006, the chances of going into tertiary education dramatically improved for young people from poorer families. Participation from the lowest income quintile more than quadrupled in this period, while participation from the second lowest income quintile virtually trebled (see OECD report on Higher Education in Chile). These groups' access clearly improved the most in percentage terms. However, all quintiles improved participation very substantially; and in 2006, the participation rate of students from the highest quintile was still over three times that of students from the lowest quintile.

- Causes of inequity include the high cost of studying in Chile (fees average 30% of per capita income, three times as high as in the US, Australia or Japan) and the conditions set for student

[19] Thus the fraction of women actually going to university goes down compared to the fraction of women taking the test. This can be explained (at least partially) by women scoring worse at the PSU test. Interestingly, also at the PISA study 2006 –where Chile did least well in maths– male students outperformed females in the math part by the biggest margin of any participating country.

support. While OECD average total education spending is 5.0% public and 0.7% private, Chiles is 3.3% public and 3.1% private. In Chile, spending on pre-primary education is 33.8% private; spending on primary and secondary education is 31.1% private; and spending on tertiary education is a mighty 84.5% private.

Facts on Timing of Marriage and Children:

- In recent years, women have been delaying their first marriage, as well as the conception of their first child in favor of more human capital accumulation: According to the National Institute of Statistics of Chile (Instituto Nacional de Estadsticas INE) the average age at which women have their first child increased from 22.73 to 23.14 between 1997 and 2007, while the average age at which women get married for the first time increased by almost 4 years (24.86 to 27.74) in the same time period.[20]

- Surprisingly, only 54% of men and 50% of women (of age 15 or more) are married in Chile. 47.7% of births were outside of marriage (in 1990 the corresponding number was 34.3%).

  (see document "Matrimonios en Chile")

- Couples were not allowed to divorce until 2004. In that year, new legislation introduced the concept of "divorce a vincula matrimonii" or total divorce, under which a member of a married couple was able to claim the termination of the marital union without any restriction. The new legislation also introduced a monetary compensation regime for the spouse who gives up his/her personal and professional development for the good of the household.

[20] In 1980 there were 7.7 marriages per 1000 inhabitants, in 1999 only 4.6. In 1999 250,674 births were registered, 40,000 less than in 1990.