

The investment in your future

An ex ante evaluation of the replacement of student grants by students loans in the Netherlands

Abstract - This paper examines the participation effects of the implementation of the subsidized loan system by the Dutch government. Our survey among 144 secondary school students reveals that parental education is strongly associated with maximum willingness to pay for higher education. This paper shows that between 0,7 percent and 3,6 percent of the secondary school students will not follow higher education due to increased costs caused by the subsidized loan system.

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Introduction

The Dutch government has decided to reduce its expenditures to meet the agreements made in the European Stability and Growth Pact (EuropaNU, 2010). A proposal to reduce the spending on higher education, which consists of higher professional education (HBO) and university institutions, is to abolish the study grant for higher education students. The current study grant system will be replaced by a subsidized loan system. When students receive an income above a certain threshold after their study, they have to repay the borrowed money (OCW, 2013).

Since 1951, the percentage of the population between the age of 18 and 25 years who followed higher education grew from 5 percent to 40 percent, resulting in 669.041 students who followed higher education in 2011/2012 (CBS Statline, 2013). In the period from 1995 to 2011 the public expenditures on higher education rose from 6,52 billion euros¹ towards 8,49 billion euros, an increase of 30,2 percent whereas the students with a higher education degree rose by 45 percent in the same period (CBS Statline, 2013).

In 2011, the public expenditures on the study grant for higher education students were 1,35 billion euros, or 15,9 percent of the total public expenditures on higher education. To reduce the expenditures, the Rutte II administration has made a proposal to reform the study funding. At this moment, a higher education student living at home receives monthly 97,85 euros of study grant which does not have to be paid back if the student completes the study within ten years. For students who do not live at home, the monthly study grant is 272,46 euros. Students receive also a so called student travel product which gives them the opportunity to travel for free with the public transportation. Besides this grant, students have the option to take an interest bearing loan with a maximum of 688 euros a month which has to be paid back within fifteen years after graduation (DUO, 2013).

The reform as proposed by the government will be implemented in September 2014 and will only apply to new bachelor or master students². The study grants will cease to exist and there will be an extension of the maximum monthly amount a student can borrow. This amount will be raised from 688 euros towards 961 euros. Besides this loan, it is possible to take an additional loan with a maximum of 250 euros depending on parental income. The repayment of the total loan will start two

¹ This amount is corrected for inflation by using the Consumer Price Index of the CBS.

² During the research, the Minister of Education decided to defer the introduction of the subsidized loan system for new bachelor students by one year to 2015.

years after a student graduates and the amount a student has to repay will depend on the earnings of the student (Rijksoverheid, 2013).

The effects of a loan system as pronounced by the Dutch government will be minimal based on the evidence from the reform in Australia. A minimal negative effect of 0,7 percent to 3,6 percent in student participation may be expected based on a questionnaire with 144 secondary school respondents. This can be explained by the fact that some students will not invest in their human capital because these students think that they do not recover the investment. This kind of behavior can be explained by a difference in ability of students. Students with a high ability know that they will graduate and receive a higher income whereas students with a lower ability are not sure if they will graduate and if they earn a higher income. So students with a lower ability will not take higher education. This new system solves in this manner the overinvestment in education. People with a too low ability follow higher education at this moment because they do not have to pay the actual costs of studying whereas under the new system they have to pay a fee which is closer to the actual costs of studying.

The data is collected through a questionnaire which is handed in by 144 secondary school students who follow Higher Secondary General Education 4 (HAVO 4) and Pre-university education 5 (VWO 5). The data reveals that parental education is strongly associated with maximum willingness to pay for higher education.

The first section of this thesis discusses the investment in human capital. Section 2 contains the literature which will be applied on the subsidized loan system as announced by the Dutch government. The next section discusses the data received from a survey conducted among secondary school students and describes the method which is applied. Section 4 presents the results from the survey and the results from the Australian reform as well as the results of previous research to the subsidized loan system. The last section gives a conclusion, recommendations and will deal with some limitations and possible improvements of this thesis and will provide some ideas for follow-up studies.

1 The investment in human capital

1.1 The decision making process

There are several factors which influence the personal decision to invest in human capital. An agent tries to optimize his utility by consuming the goods and services he likes. The agent has to optimize his utility because there are some constraints the agent has to consider. These restrictions include obviously money, but also time is an important restriction. Given these restrictions the agent optimizes his utility. His utility may consist of monetary advantages, a better health condition but also subsidized advantages because an agent takes a decision. Think about the decision to take a job, besides the monetary advantages it also has some social advantages like meeting new colleagues and the feeling that you are meaningful for an organization or the society. The sum of these advantages could give the agent more utility than the utility he loses by giving up his free time and that is why the agent could decide to take a job.

Like the decision to take a job, also the decision to follow education, an investment in human capital, is based on utility. There are several factors which influence the personal decision to invest in human capital. One should invest in human capital if the utility which is gained exceeds the utility which is lost due to the decision. The utility which is gained due to this decision may consist of the expected higher income, meeting new friends, discovering a new country for students who go on exchange and so on. The utility which is lost consists mainly of the opportunity costs of following higher education. If an agent decides to follow higher education for a certain period, he is not able to work full-time and misses the income he could earn during this period. Besides these opportunity costs, also tuition fee, literature and for some students the rent for a living space are costs of following higher education and will lower the utility of the agent (NIBUD, 2013).

There are some problems with this economic theory if price signals to the decision makers are not the right price signals, signals which represent an individual as well as a social optimum. Individuals make their decisions based on their own private costs and benefits due to the decision they make and optimize their own individual welfare function. If the government takes a decision, they also take into account the benefits and costs due to this decision concerning the society. The government optimizes the social welfare function. If there are benefits or costs of a decision concerning the society, the optimums of both the individual welfare function and the social welfare function are not similar.

To illustrate this, think about a fabric which causes polluted air. The fabric owner decides to do nothing about this, because a filter will cost him money and does not increase his private benefit. However, the society, say the neighbors of the fabric, suffer from the polluted air caused by the fabric. For them, a filter which reduces the polluted air will create a benefit. If the government optimizes the social welfare function, they take the benefit of the society, the neighbors of the fabric, into account. If the government wants to achieve the social optimum, they should create price signals to individuals which causes that the individual optimum is the same as the social optimum.

If price signals are not the right price signals, an over or underinvestment will arise. This can occur if the tuition fees are below the actual costs of studying or if the benefits are higher than the actual benefits due to study grants. If the costs are too low and/or the benefits are too high, more people will choose to invest in human capital. This causes an overinvestment, an excessive amount of higher educated people than is represented by the social optimum, in human capital.

This overinvestment can be solved by giving the right price signals to the decision makers. A subsidized loan system gives the right price signals to a student if this system is implemented in the right way (MEV, 2004). To achieve the right price signal, the government has to find the proper balance between the private and public costs of education (Biffi & Isaac, 2002). If students do not have the funds for studying, they have to have the option to borrow money from the government to make sure they can make their optimal decision regardless of their financial position at that moment.

There is a discussion going on about the elasticity of education. Some researchers argue that tuition fee is inelastic which means that students do not, or very little, react on a decrease or increase of the tuition fee (Heller, 2000). The amount of education does hardly change if the price of education changes. This means that tuition fee is not the appropriate tool to influence the decision of following higher education. However, there is also some research which concludes that tuition fee is elastic (Carter & Curry, 2011). If tuition fee is the right tool to influence the decision of following higher education is still an unanswered question.

1.2 The causal effect of higher education on earnings

One of the arguments of the Dutch government for introducing a subsidized loan system is that higher education students face higher earnings after they graduate. If students have the advantages of higher education, they have to pay for these advantages according to the Dutch government (OCW, 2013). But is this statement of the Dutch government right? Ashenfelter and Card investigated the causal relation between education and earnings (Ashenfelter & Card, 1999). Ashenfelter and Card

used a theoretical approach as well as an empirical approach for their research. The main problem of identifying the true casual effect of education on earnings is that a lot of other factors, so called confounding variables, influence the earnings of students as well as their choice for education. Think about the ability, health or Social Economic Status of a student. Due to these confounding variables, it is not possible to compare the earnings of a group of persons who take higher education with the earnings of a group of persons who did not take higher education to estimate the effect of education on earnings. Both groups will differ in many other aspects which will influence the earnings of both groups.

There are a couple of possible solutions for this identification problem. One could run a regression with education as independent variable and earnings as dependent variable, taking into account the possible control variables. This solution creates immediately two new problems. First, which factors have to be taken into account? Think about the variable ability. This variable has to be taken into account because it will influence an agent's choice for education as well as the agent's earnings. After deciding which variables have to be included, the second problem arises. Is it possible to measure the variables in a way that the variables present the facts they have to represent? Think again about ability, that it has to be included in the regression is clear, but what is the right way to measure ability such that ability does not cause endogeneity³?

A second method to estimate the causal relation between education and earnings is to use a technique known as Instrumental Variables (IV). The first requirement of an instrumental variable is that it is correlated with the treatment variable, in this case education. The second requirement of an instrumental variable is that this variable is absolutely not correlated with the outcome or dependent variable except through the independent variable. The third requirement is that the instrumental variable affects the treatment in only one direction (Appendix 2.2) (Kippersluis, 2012). In their book *Handbook of Labor Economics*, Ashenfelter and Card stated that variables such as minimum school leaving age, tuition costs for higher education or geographic proximity of school are reasonable variables to meet the requirements of an instrumental variable. This method also has his drawbacks. In practice, it is very hard to find good instrumental variables which do not influence the dependent variable. And even if this requirement is fulfilled, Ashenfelter and Card argue that the instrumental variable will not necessarily lead to an unbiased proxy of the average return to education (Ashenfelter & Card, 1999, p. 1819).

³ Endogeneity refers to correlation between an independent variable and the error term of a regression and could arise if there is a measurement error in the independent variable.

A third method which is used to estimate the causal effect of education on earnings is the use of siblings. By nature, siblings are exactly the same and mostly share the same family background, so many unobserved differences in variables like ability will be eliminated or at least reduced. This simplifies the process of the identification of the causal effect of higher education on earnings. A drawback of this approach is the assumption that some unobserved variables have the same value for twins. This assumption is not verifiable because the unobserved variable is, as is already said, unobservable.

The main results of the research of Ashenfelter and Card is that the average returns on education are positive and can be measured by using the human capital earnings function, or the so-called Mincer equation, developed by Mincer. The Mincer equation explains the earnings of an agent by using of the years of schooling and the years of potential work experience (Mincer, 1974).

Now that it is proven that following higher education leads to a higher income, the government has an argument to let students pay, partially, the costs of studying as studying has a private benefit besides the public benefit.

1.3 Debt aversion

The opponents of the subsidized loan system claim that students have a debt aversion (BN DeStem, 2012). Although students are allowed to borrow money from the government, due to the debt aversion of students some will not take a loan and will not take higher education which could be harmful on individual and social level. Research by Loewenstein and Thaler revealed that people have a debt aversion. This debt aversion is caused because people do not use the market interest rate to discount cash flows which causes that students do not compare the actual present value of cash flows generated from following higher education with the present costs of following higher education. The actual discount rate used by people is based on the magnitude, the timing and the sign of the cash flow that is discounted. Higher amounts of cash flows are discounted against a more reasonable, lower, discount rate as with smaller amounts of cash flows. Cash flows which occur later in time are discounted against a lower discount rate and negative cash flows are also discounted against a lower discount rate (Loewenstein & Thaler, 1989). Oosterbeek and Van den Broek showed in their paper, in which they investigated the survey results of more than 8.000 Dutch higher education students, that debt aversion plays a role in the borrowing decisions of Dutch higher education students (Oosterbeek & Van den Broek, 2009). However, Davies and Lea found that the effect could also run the other way around which means that the choice of borrowing influences

debt aversion. They found that the increase in debt took place before the increase in attitude towards debt of students by using a cohort study (Davies & Lea, 1995).

2 Literature Review

2.1 The reform in Australia

Since January 1974 tuition fees were abolished by the Whitlam Labor Government in order to make tertiary education more accessible. Australia changed this system in 1989 by introducing the Higher Education Contribution Scheme (HECS). The original HECS charged a tuition fee of 1.800 Australian dollars. Students could decide if they paid it themselves at the beginning of the academic year or that the government paid it for them in advance. In the latter case, the students had to repay this tuition fee through a subsidized income contingent loan scheme by an additional income tax rate. When they had paid off their debt through the additional tax rate, this tax rate expires (Harrison, 1997). One of the benefits of this system is that the student does not have to take a loan upfront to pay the tuition fee. This will probably attract more students who have a debt aversion and will not enter university if they have to take a debt upfront, although they might have the ability to attend university education. HECS was reformed in 1997 towards a three-tier structure where fees were based on the earnings prospects of a study and on the social contribution of a study. Tuition fees for studies like Arts became the lowest, nowadays up to 5.310 Australian dollars, whereas studies like Medicine or Law had a much higher tuition fees, nowadays up to 8.859 Australian dollars (King, 2001).

In the following two decades a lot of research has been done into the effects of HECS. Harrison described in his article that the original HECS does not have the right price signals; the prices paid by the decision makers are not the prices which lead to the social as well as the individual optimum. This is because the tuition fee for each course was the same, namely 1.800 Australian dollars. The tuition fee which leads to the social and individual optimum is equal to the marginal cost less the possible external benefits of a course. As the marginal costs and external benefits are different for each study, one standard tuition fee for all studies is inefficient. (Harrison, 1997). Miller and Pincus suggest adjusting some elements of HECS into a system they called SuperHECS. The government has to pay a subsidy of 50 percent of the course costs directly to universities. Universities are allowed to set tuition fees. These fees can be paid by students through a system called SuperHECS. The main difference between HECS and SuperHECS is the tax deductibility. As educational expenditures are investments, they have to be tax deductible according to the authors. This tax deductibility can be deferred until an (post)-student's income reaches a certain threshold whereas students at the moment of studying mostly do not have a taxable income which makes the

tax deductibility of study costs superfluous. The adjustment would lead to an efficiency gain and will enhance the quality of the education system. This SuperHECS was designed by Miller and Pincus because under HECS, students do not receive the right price signals resulting in enrolments for university courses which are inefficient (Miller & Pincus, 1998).

Chapman and Ryan investigated the effect of the original HECS, which was implemented in 1989, on the Social Economic Status distribution of students. They conclude that the SES distribution among students was more equal in 1999 than it was in 1989. Besides that, they conclude that HECS did not lower university participation in general or among individuals from low wealth groups (Chapman & Ryan, 2005). Andrews also investigated whether HECS deter students from low SES groups. His main conclusion was that HECS has a very minor influence on the participation of low SES groups in higher education. More important for the decision to invest in human capital are the values and attitudes of low SES groups towards higher education (Andrews, 1999).

The discussed literature reveals that the government has to set the right prices in order to achieve the individual and social optimum of higher educated people. None of the papers concludes that the Australian price increases leads to the deterrence of low Social Economic Status students. Also none of researchers concludes that there is a substantial or significant decrease in student participation in higher education after a price increase.

2.2 Previous research on the subsidized loan system in the Dutch institutional context

To estimate the possible effects of the subsidized loan system, the Central Planning Agency (CPB) concluded in March 2010 that the participation effects of an increase of the private costs of higher education are negligible. The income effects of students who borrow money to finance the study grant they receive at this moment, will be between -0,8 percent and -4,2 percent depending on the amount of the debt and the repayment schedule based on simulations. This means that students will earn a lower income after graduation, which could affect the participation as the private benefit of following higher education is lower due to the lower income. They conclude that participation in higher education has not decreased after an increase in private costs of higher education based on evidence from Australia, New Zealand and the Netherlands. They found no clear evidence of different price elasticity among students from different social backgrounds. Debt aversion could determine the decision of some students, but the evidence is limited (CPB, 2010).

In January 2013 the Central Planning Agency came with a new note on the subsidized loan system. Based on student elasticity towards tuition costs they conclude that the expected decrease

in students for higher professional education (HBO) is 4.000, 1,5 percent of the total higher professional education students, and for university education 3.500, 2.1 percent (CPB, 2013).

Most recent research is derived from the Social and Cultural Planning Agency (SCP) which presents their report in June 2013. Based on interviews with 120 students from different SES groups and a literature review they conclude that the participation effects of the increase in private costs for higher education are minor because of the small price elasticity for higher education. They conclude also that students prefer to work more than to borrow money to finance the costs of education. There is no difference in participation between low and high Social Economic Status students, although low Social Economic Status students are more reticent and skeptical to follow higher education due to the new regulation (SCP, 2013).

2.3 Debt aversion

The opponents of the subsidized loan system, mainly the left-orientated parties in the Dutch parliament, claim that students have a debt aversion (BN DeStem, 2012). This causes that some students, who have the ability to follow higher education, will decide not to follow higher education because they are afraid of taking a loan. Loewenstein and Thaler claim that, besides the financial costs of debt like redemption and interest costs, debt causes also physical costs to students (Loewenstein & Thaler, 1989). These physical costs are not incorporated in the decision

If something like a debt aversion exists among students, there is a solution which is already implemented in Australia in 1989. Australian students do not pay their tuition fee upfront, but pay their tuition fee indirectly after their study through an additional tax rate if their income exceeds a certain threshold. If they paid enough tax to cover the costs of their study, the additional tax rate expires. This payment schedule ensures that students do not have to take a loan to cover their tuition fee and so do not have to be afraid of repaying the loan. And because students do not have to take a loan, something like a debt aversion plays no role in the decision of attending higher education.

In the proposal of the Dutch government, this kind of repayment schedule is not incorporated. Students have to take a loan to pay the tuition fee upfront. But also this repayment schedule has an element which deals with debt aversion and is the reason why the Dutch government called it a subsidized system. However, the pronounced Dutch repayment schedule might be not as strong in dealing with debt aversion as the Australian system does as described above. The proposal stated that students do not have to repay the loan if their income after

completing their study is below a certain threshold. This ensures that students do not have to make repayments on their loans if they have no, or a too low, income. Through this element of the proposal, debt aversion should play no role in the decision of attending higher education. However, students have to take a loan upfront if they cannot finance the tuition fee themselves which is different in comparison with the Australian system where students do not have to take a loan at all. Although both systems are not fundamentally different, due to the framing differences between both systems, the Australian system seems to deal better with the possible debt aversion of students than the proposed system of the Dutch government.

3 Data & Method

The data is composed by questioning 144 secondary school students in the age of 15 to 18 years. They received a questionnaire which contained 13 questions about their Social Economic Status and their (next) education level. On average, it took the students 10 minutes to complete the questionnaire.

3.1 Questionnaire

The questionnaire contains thirteen questions in total. Seven of these questions correspond to the background of the student, three questions about expectations of students, two questions about risk aversion and one question about the maximum willingness to pay for education (Appendix 2.2). The answers of students on their background and the highest education of their parents were used to identify the Social Economic Status of students. The questions about expectations were related to expected yearly income after following higher professional education or university education and about if students feel themselves more comfortable on a higher professional educational institution or on an university. The two questions about risk aversion were used to discover the risk aversion of students and if they are consistent in their risk aversion.

To discover the maximum willingness to pay of students, a table is made in which students could choose for higher education or not, given the cost of studying. At a certain point, students switch from the decision to following higher education towards the decision to not follow higher education. The associated studying cost at this point, is the maximum a student is willing to pay for higher education.

3.2 Participants

The questionnaire is designed for secondary education students. Two secondary schools have given permission to spread the questionnaire among their Higher General Secondary Education (HAVO) 4 students and Pre-university education (VWO) 5 students. One school did not allow the students to fill in the questionnaire in class. Although it was voluntary to students to fill in the questionnaire, 40,5 percent of the students handed in the questionnaire. On the other school the questionnaire was

filled in by 65 students in class which lead to a 100 percent response rate. In total 260 students received the questionnaire and 144, 55,4 percent, completed it.

The reason to question only Higher General Secondary Education 4 students and Pre-university education 5 students is because these students were at the beginning of this research the ones who became the first Bachelor students under the subsidized loan system. During the process of questioning, the minister of Education announced that the introduction of subsidized loan system for Bachelor students is deferred by one year (De Volkskrant, 2013). The introduction is deferred as a consequence of the rapport of the Social and Cultural Planning office which stated that students have to be better informed about the rules of the new system (SCP, 2013). Although the students who filled in the questionnaire are not the ones who are the first bachelor students under the new system, the assumption is made that they act the same as the students of the classes 3 and 4 who are going to study under the new system. This assumption is reliable because it is randomly divided if somebody is born one year earlier or later and so students are randomly divided between class 3 and 4 in the case of Higher General Secondary Education or class 4 and 5 in the case of Pre-university education.

3.3 Descriptive statistics and the data transformations

The data consists of 144 observations of which 71 are man and 73 are women (Table 1). The average age is 16,7 years. 128 students follow Pre-university education, whereas only 16 follow Higher General Secondary Education. This difference is caused because on the school where the questionnaire was filled in in class, it was not allowed to question the Higher General Secondary Education students. On the school where it was voluntary to fill in the questionnaire, 125 questionnaires are spread among Higher General Secondary Education students but only 16 students, 12,8 percent, handed it in. The average student in this dataset is not significantly different from risk neutral, although the standard deviation is 0,25 on a scale of 0 to 1. Most students, 95 percent, have a Western-European background, the remaining 5 percent comes from other backgrounds. 69 percent of the parents of the students followed higher education, 21 percent lower education and 10 percent of the students does not know what kind of education their parents followed.

To estimate the effect of variables on the maximum willingness to pay of students, some data had to be adapted or rewritten. The following paragraphs describe the process of adapting or rewriting.

The attitude towards risk is measured by using question 7 of the questionnaire. The answers of the students are divided by 100 to create a scale which is between 0 and 1. Question 6 is used as a control. If students answer to question 7 500 euro, the turning point in question 6 has to be at 500 euro. A dummy is made to test for consistency of the respondent which is 1 in the case of consistency and 0 otherwise.

The house price of students is based on their zip code which they filled in in question 3. By using the database of the Central Bureau of Statistics (CBS), the average house price of the neighborhood is used to estimate the house price of a student living in the neighborhood. On average, this is a reliable way to measure the house price of students.

Question 4 in the questionnaire is addressed to ethnicity to identify differences between cultural backgrounds. Despite of the large sample and of questioning 65 students from The Hague, which is a city with a multicultural society, only 7 students choose another ethnicity than Western European. They are grouped together as the group Non-Western European to try to identify differences between a Western European background and a Non-Western European background.

The variable parental education is based on question 8. The respondents who filled in “*Universitair*”, “*HBO*” or “*VWO*” are grouped together as the group with high parental education. Respondents who choose the other options are grouped together as the group with low parental education except the ones who filled in “*Geen idee*”.

Question 11 refers to the next field of study. A lot of respondents used to the option “*Anders*” and filled in the exact study they expecting to follow. These answers are classified into the given categories. For example sport studies are assigned to the category Social and respondents who filled in Medicine are assigned to Technical. Because very little respondents choose for Linguistic, this category is grouped with the category Social.

The answers of question 13 about friends are transformed into numbers with a scale of 0 to 4 where 0 stands for “*Sterk mee eens*” and 4 stands for “*Sterk mee oneens*”.

To control for Social Economic Status, parental education, house price and ethnicity are used as control variables. These factors cannot be influenced by the students but do influence the student’s behavior and reference framework. The variables are individually included into the regressions.

3.4 Method

The method which is used to investigate the data will be (multivariate) regression analysis. The relationship between the variable maximum willingness to pay and the other variables is investigated. Especially the relationships between the expected income after following higher education, risk aversion and maximum willingness to pay will be investigated as it is the expectation that the relation will be positive and negative respectively.

4 Results

4.1 Main empirical results from the questionnaire

The education level of the parents is significantly influencing the maximum amount a student is willing to pay for education. Students with high educated parents are willing to pay on average 18.123 euros more. When controlled for the factor ethnicity, which also influences the Social Economic Status of a student, this amount is decreased towards 17.251 euros. There is also a significant positive relationship between the attitude towards risk of students and their maximum willingness to pay (Table 2). The decrease in participation will be between the 0,7 percent and the 3,6 percent (Table 5).

4.1.1 Main results

Parental education has a significant influence on the maximum amount a student is willing to pay. The parental education of a student remains significant when controlled for ethnicity. The coefficients decreases from 18.123 euros towards 17.251 as can be seen in model 17.

Table 3 presents the descriptive statistics of students of high educated parents and low educated parents. There is no clear difference between the two groups except for the maximum willingness to pay. It is remarkable that students with low educated parents live in houses with the same price as students with high educated parents as the difference is not significant.

Table 4 presents an overview of the difference in the maximum willingness to pay for higher education. Table 4.2 shows that only 3 percent of the students of low educated parents is willing to pay an amount above 69.999 euros against 29 percent of the students of high educated parents.

Model 1 presents the results from the simple regression of attitude towards risk on the maximum willingness to pay for education. The coefficient is positive and statistical as well as economical significant. If the attitude towards risk changes by 0,1, a student is willing to pay an additional amount of 2.615 euros. This confirms the hypothesis that students who are less risk averse are willing to invest more. When controlled for factors that influence Social Economic Status as has been done in model 12, the coefficient is still significant. The attitude towards risk does influence the maximum amount a student is willing to pay for education.

The data from the questionnaire reveals that the participation effects will be between -0,7 percent and -3,6 percent for secondary school students. From table 5.1, which only contains tuition

fee and literature as costs of studying, a negative 0,7 percent change in student participation can be expected after the introduction of the subsidized loan system. Table 5.2 also incorporates rent for living space as a cost of studying as it is not clear if the respondents of the questionnaire see this as a cost of studying. By adding rent for living space as an additional cost for studying, also the study grant is adjusted towards a study grant for students living away from home. Tables 5.2 shows that the participation effect of the introduction of the subsidized loan system will be -3,6 percent.

As explained earlier, one of the biggest costs of studying is the opportunity cost. Instead of following higher education, one could also decide to start working after following secondary education. If somebody could earn net 15.000 euros a year, and studying takes 4 years, the opportunity cost of studying is 60.000 euros which is by far the largest cost of studying. It is not clear of the respondents having thought about this cost, but it does not look like they did. Table 5.3 presents the participation effects if opportunity costs are taking into account. Most striking result is that, even if the subsidized loan system is not introduced, only 23,6 percent of the secondary school students will follow higher education. This number is unrealistic low, as the official number of secondary school students that follow higher education after completing the secondary school is 85 percent (Examen.nl, 2013).

4.1.2 Other results

In a simple regression of each of the two variables for expected income after following higher education, both variables are positive and statistical and economical significant. These results confirm the hypothesis that if the reward of following higher education is higher, a student is willing to invest more in higher education. There is a problem with the size of the coefficients when compared to each other. If the income after following higher professional education (HBO) is 1 euro a year more, a student is willing to invest 1,133 euro more. If the income after following university education is 1 euro more, a student is willing to invest just 0,436 euro more. One could expect that these numbers should be the same. After all, it is only important if someone receives the additional 1 euro, and not the form of education which is needed to receive that additional euro. After controlling for Social Economic Status, both coefficients turn out to be insignificant as can be seen in model 13 and 14.

Only students who follow at the moment the study program Science and Technology are significantly willing to pay more for higher education in comparison to the students who follow a study program Culture and Society. When controlled for Social Economic Status, the variable

becomes insignificant. Students who plan to follow a technical study program after their current study are willing to pay 24.828 euro more in comparison to students who want the study a social study. However, just as with the previous coefficients, these coefficients also turn out to be insignificant when controlled for Social Economic Status.

There is no difference in the amount a student is willing to pay for higher education based on secondary school level. Although students who follow Pre-university education are willing to pay an additional amount of 515 euros, this number is absolutely insignificant as the p-value is 0,96. Also the next education level, higher professional education or university education, does not significantly determine the maximum amount a student is willing to pay.

Model 8 shows that there is no significant relationship between the importance of friends and the maximum amount a student is willing to pay.

4.2 Results from the literature review

4.2.1 Results derived from the Australian reform

The effects of the implementation of the Higher Education Contribution Scheme (HECS) seem to be negligible. Multiple reports show that HECS does not deter and the distribution among students was ten years after implementation more equal than at the time of implementation. Although HECS and the subsidized loan system are not perfect substitutes for each other, the conclusion, based on the evidence from Australia, is that the subsidized loan system will have a minor influence on the participation and SES-distribution of students.

4.2.2 Results derived from previous research to the subsidized loan system

Former research concludes that the subsidized loan system will have a minor influence on the participation effects of students. Most research recommends monitoring the effects of the subsidized loan system very carefully after the introduction because it is unknown if debt aversion has a significant influence on the decision to follow higher education.

5 Conclusion and recommendations

5.1 Conclusion

The general conclusion is that the implementation of the subsidized loan system will not lead to a decrease of low Social Economic Status groups or a substantial decrease in higher education participation of students. Based on the questionnaire, between 0,7 percent and 3,6 percent of the secondary school students will not follow higher education due to the higher costs of studying after the implementation of the subsidized loan system.

5.2 Limitations, improvements and further research

Most limitations refer to the questionnaire. Question 12, which measures the maximum willingness to pay of students, is not clear because it is unknown if students see costs for living, rental and opportunity costs of higher education also as actual costs. Some students do not, other do, what obviously leads to different values. Another limitation of this research is that most respondents, 95 percent, have a Western European background. This makes it hard to detect differences between ethnicities and draw conclusions about ethnicity. In a next survey, it is recommended to insert a question about the ability to borrow money from parents, as the answer on this question reveals first something about the Social Economic Status of a student and second something about the possibilities for a student to collect the money to finance higher education costs.

The effects of framing on the participation of students could be investigated a couple of years after implementation of the subsidized loan system in the Netherlands. It is particularly interesting to investigate the differences in student participation between the Dutch and the Australian system. Although both systems are not fundamentally different from each other, due to the difference in framing it might be possible that there are different participation effects caused by the theoretical idea that the Australian system seems to deal better with debt aversion of students as students do not have to take a loan upfront to pay the tuition costs.

Further research towards the relation between the expected income after following higher education and the maximum willingness to pay is also recommended. In the sample, there was a relation but this relation was not strong enough in order to be significant when controlled for Social Economic Status. When respondents are more informed about the returns of education, it may be possible that the relationship holds, also after controlling for Social Economic Status. Theoretically is

this a logical relationship, the higher the expected returns, the more one should pay to receive these higher expected returns.

5.3 Recommendations

After drawing the conclusions, there are some practical recommendations for the Minister of Education about the subsidized loan system. Although the claim of opponents that students have a debt aversion cannot be proven, it is strongly advised to introduce an income-contingent loan scheme. This system ensures that students do not have to borrow money upfront and by doing so debt and risk aversion play no role in the decision making process anymore. This system is implemented in Australia in 1989 and research by Chapman and Ryan shows that the income-contingent loan scheme does not deter and that the participation of marginal decision makers does not fall (Chapman & Ryan, 2005).

A second recommendation is to inform students more about the costs of studying and the expected income after following higher education. It was hard for secondary school students to estimate the costs of studying and to estimate the expected income after higher education. The standard error of both variables shows a large variation among students which indicate that students have a very different view on expected income after following higher education (Table 1).

A third recommendation is to introduce different tuition fees for different studies. Technical studies are much more expensive to provide than courses like economics because a lot of expensive technical equipment is needed. Also studies with a higher expected return could be charged with a higher tuition fee and at the same time could the tuition fee of studies with high social benefits like nursery and education be lowered. A so called three-tier structure is in Australia implemented in 1997 by the Howard Labor Government to create price signals to students which represents more the actual costs of higher education. By giving the right price signals to students, the government ensures that the social as well as the individual optimum of higher educated people will be reached. This makes an over- or underinvestment in higher education less realistic.

5.4 Discussion

In the discussed literature as well as in the Dutch parliament there is an ongoing debate about equality and accessibility of higher education where politicians use sometimes both terms for one

and the same definition. This makes debating hard and causes unnecessary miscommunication between political leaders.

The definition of accessibility of higher education which is used in the literature refers to the possibility of someone to follow higher education. There is an overall agreement that somebody who has the ability to follow higher education also has the possibility to follow higher education. Social Economic Status should play no role and should not influence the decision of the student to follow higher education.

Equality means something else. Equality refers to the ratio of students of low Social Economic Status groups against students from high Social Economic Status groups. For years, higher education is unequal; much more students come from high SES groups. However, this fact on itself does not mean that that higher education is inaccessible for students with a low Social Economic Status.

One could argue that at this moment the system of funding higher education is not fair. Students receive a subsidy of the government which is paid from the tax revenues. After finishing the study, these students will earn on average a high income. One could ask himself is this is fair to subsidize people who on average will earn a modal income.

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Main Appendix 1

Main Appendix 1.1 Descriptive statistics

Descriptive Statistics					
Variable	Scale	Subgroup	Mean	S.D.	Proportion
Age	Years		16,70	0,67	
Attitude towards risk	0 - 1		0,46	0,25	
Expected income HBO	Euros/year		36.650,00	7.421,60	
Expected income WO	Euros/year		49.485,71	16.402,86	
Maximum willingness to pay	Euros		65.607,14	37.829,93	
House price	Euros		298.703,13	110.211,56	
Gender	0/1 dummy	Man			0,49
		Women			0,51
Study Program		Science and Technology			0,30
		Science and Health			0,20
		Economics and Society			0,42
		Culture and Society			0,08
Ethnicity		Western European			0,95
		Other			0,05
Secondary school level		Pre-university education			0,89
		Higher General Secondary Education			0,11
Parental education		Higher education			0,69
		Lower education			0,21
		Do not know			0,10
Expected best fit		University			0,64
		Higher professional education			0,18
		Neither of them			0,01
		Do not know			0,17
Next study program		Technical			0,31
		Economic			0,18
		Social			0,36
		Do not know			0,13
		Non (not going to study)			0,02
Next education level		University			0,70
		Higher professional education			0,18
		Do not know			0,10
		Non (not going to study)			0,02
Friends	0 - 4		3,41	0,70	

Table 1

Main Appendix 1.2 Results

Determinants of maximum willingness to pay												
Variable	Subgroup	1	2	3	4	5	6	7	8	9	10	11
Attitude towards risk		26.145*										
		(12.505)										
Expected income HBO			1,133*									
			(0,453)									
Expected income WO				0,436*								
				(0,205)								
Study program	Science and Technology				27.822*							
					(12.698)							
	Science and Health				20.752							
					(13.518)							
	Economics and Society				15.705							
					(12.359)							
Secondary school level						516						
						(10.659)						
Next education level							2.067					
							(8.728)					
Next study program	Technical							24.828**				
								(7.671)				
	Economic							1.469				
								(8.918)				
Friends									1.653			
									(4.581)			
Parental education										18,123*		
										(7,684)		
Ethnicity											8.759	
											(14.653)	
House price												0,053
												(0,030)
* = significant at 5%												
** = significant at 1%												

Table 2.1

Determinants of maximum willingness to pay							
Variable	Subgroup	12	13	14	15	16	17
Attitude towards risk		26.783* (12.930)					
Expected income HBO			0,686 (0,493)				
Expected income WO				0,336 (0,218)			
Study program	Science and Technology				29.984* (12.980)		
	Science and Health				17.468 (13.929)		
	Economics and Society				17.383 (12.669)		
Secondary school level							
Next education level							
Next study program	Technical					21.271* (8.262)	
	Economic					1.138 (9.351)	
Friends							
Parental education		17.251* (7.661)	17.446* (16.654)	19.276* (7.653)	19.410* (7.958)	18.934* (8.312)	18.945* (7.752)
Ethnicity		11.358 (16.603)	13.760 (16.654)	17.664 (16.842)	12.111 (15.604)	5.058 (17.233)	13.278 (15.520)
House price							
* = significant at 5%							
** = significant at 1%							

Table 2.2

Main Appendix 1.3 Descriptive statistics based on parental education

Parental education statistics			
Variable	Subgroup	High educated	Low educated
Total students		100	30
Attitude towards risk		0,47	0,44
Expected income HBO		36.877	35.083
Expected income WO		48.756	49.917
Study program	Science and Technology	0,31	0,27
	Science and Health	0,15	0,30
	Economics and Society	0,45	0,33
	Culture and Society	0,08	0,07
Secondary school level	Pre-university education	0,88	0,97
	Higher General	0,12	0,03
	Secondary Education		
Next study program	Technical	0,27	0,40
	Economic	0,19	0,17
	Social	0,36	0,33
	Do not know	0,16	0,07
	Not goin to study	0,02	0,03
Friends		3,34	3,60
Ethnicity	Western European	0,94	1,00
	Other	0,06	0,00
House price		296.375	303.933
Maximum willingness to pay		69.196	51.000

Table 3

Table 3 presents the descriptive statistics of variables divided between high and low educated parents.

Main Appendix 1.4 Parental education and maximum willingness to pay

Parental Education		
Classes	High educated	Low educated
Do not know	0,03	0,00
0-9.999	0,01	0,00
10.000-19.999	0,01	0,14
20.000-29.999	0,13	0,07
30.000-39.999	0,17	0,24
40.000-49.999	0,17	0,14
50.000-59.999	0,16	0,21
60.000-69.999	0,05	0,17
70.000-89.999	0,05	0,00
90.000-109.999	0,10	0,00
110.000-129.999	0,00	0,00
130.000-150.000	0,13	0,03
Total	1,00	1,00

Table 4.1

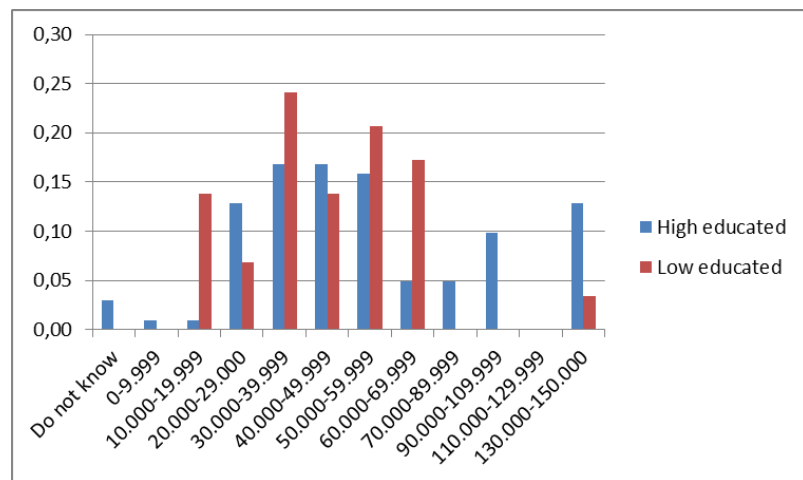


Figure 4.1

Table 4 and figure 4.1 present the distribution of the maximum willingness to pay of students of high educated parents and of low educated parents

Parental Education (Cumulative)		
Classes	High educated	Low educated
0-9.999	0,01	0,00
10.000-19.999	0,02	0,14
20.000-29.999	0,15	0,21
30.000-39.999	0,33	0,45
40.000-49.999	0,50	0,59
50.000-59.999	0,66	0,79
60.000-69.999	0,71	0,97
70.000-89.999	0,77	0,97
90.000-109.999	0,87	0,97
110.000-129.999	0,87	0,97
130.000-150.000	1,00	1,00

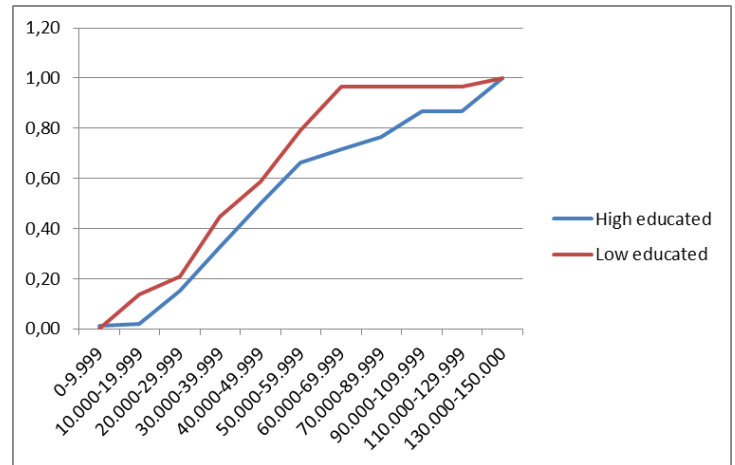


Figure 4.2

Table 4.2

Table 4.2 and figure 4.2 present the cumulative distribution of the maximum willingness to pay of students of high educated parents and of low educated parents. At 69.999 euros, 97 percent of the students with low educated parents are unwilling to pay more for higher education whereas only 71 percent of students of high educated parents are unwilling to pay more.

Main Appendix 1.5 Participation effects

Costs of studying (EUR)	Per month	Per year	Entire study	Participation	Participation effect
Literature	84	1.008	4.032		
Tuition fee	153	1.835	7.340		
Gross costs of studying	237	2.843	11.372		
Study grant	-98	-1.174	-4.697		
Net costs of studying	139	4.017	16.069	100,0%	-0,71%
Costs of studying after implementation of the subsidized loan system	237	2.843	11.372	99,3%	

Table 5.1

Costs of studying (EUR)	Per month	Per year	Entire study	Participation	Participation effect
Rent	341	4.092	16.368		
Literature	84	1.008	4.032		
Tuition fee	153	1.835	7.340		
Gross costs of studying	578	6.935	27.740		
Study grant	-272	-3.270	-13.078		
Net costs of studying	305	3.666	14.662	99,3%	-3,60%
Costs of studying after implementation of the subsidized loan system	578	6.935	27.740	95,7%	

Table 5.2

Costs of studying (EUR)	Per month	Per year	Entire study	Participation	Participation effect
Opportunity costs	1.250	15.000	60.000		
Rent	341	4.092	16.368		
Literature	84	1.008	4.032		
Tuition fee	153	1.835	7.340		
Gross costs of studying	1.828	21.935	87.740		
Study grant	-272	-3.270	-13.078		
Net costs of studying	1.555	18.666	74.662	23,6%	0,00%
Costs of studying after implementation of the subsidized loan system	1.828	21.935	87.740	23,6%	

Table 5.3

Tables 5.1 and 5.2 show the participation effects of secondary school students due to the introduction of the subsidized loan system. In table 5.1 rents for living space is not incorporated and the study grant is based on a student living at home. Table 5.2 does incorporate rent for a living space and the study grant is based on a student living away. Table 5.3 shows that students in the

sample do not incorporate the opportunity costs of studying in their decision making process as only 23.6 percent of the students should follow higher education at this moment which is obviously far too low as the official percentage is 85 percent (Examen.nl, 2013). The costs of the different topics are based on research of NIBUD (NIBUD, 2013).

Appendix 2

Appendix 2.1 Instrumental Variables, mathematically

Z is the instrument variable, which influences the treatment variable T.

$$T_i = \delta + \gamma Z_i + v_i$$

Insert the above equation into the following equation where T influences Y, the dependent variable:

$$\begin{aligned} Y_i &= \alpha + \rho T_i + v_i \\ &= \alpha + \rho(\delta + \gamma Z_i + v_i) + v_i \\ &= (\alpha + \rho\delta) + \rho\gamma Z_i + (v_i + v_i) \\ &= \theta + \tau Z_i + \eta_i \end{aligned}$$

Now, $\tau = \rho * \gamma$ hence $\frac{\tau}{\gamma} = \rho$

Appendix 2.2 Questionnaire

Enquête Vervolgopleiding

Beste VWO 5-leerling van de Dalton Den Haag,

Er wordt op dit moment onderzoek gedaan naar de vervolgopleidingen die jullie willen gaan volgen. Voor dat onderzoek hebben wij jullie nodig. We willen graag dat jullie antwoord geven op de onderstaande vragen. Indien je het antwoord niet weet, vul dan “weet niet” in. Indien je kunt kiezen uit verschillende antwoorden, omcirkel dan het antwoord dat voor jou het best van toepassing is.

1. Leeftijd:

2. Geslacht: Man / Vrouw

3. Postcode:

4. Welke etnische afkomst zou jou het beste beschrijven?

West-Europees / Surinaams / Antilliaans / Marokkaans / Turks

Anders, namelijk.....

5. Welk vakkenpakket volg je op dit moment?

E&M / N&T / N&G / C&M

6. Stel: Je moet kiezen uit het spelen van een loterij met 50% kans op € 0,- en 50% kans op € 1.000,- of het krijgen van een vast bedrag met 100% zekerheid. Geef bij elk van de onderstaande vaste bedragen aan of je de loterij wilt spelen of het vaste bedrag wilt ontvangen.

Vast bedrag	Loterij	Vast bedrag
€ 600,-		
€ 500,-		
€ 400,-		

7. **Stel: Je moet kiezen tussen meedoen aan een loterij waarbij je 50% kans maakt op € 0,- en 50% kans maakt op € 1.000,- winst of het krijgen van een vast bedrag met 100% zekerheid? Met welk vast bedrag zou jij even tevreden zijn als met het spelen van de loterij?**

.....

8. **Wat is het de hoogste opleiding van de kostwinnaar in jullie huishouden? (degene die binnen het huishouden het hoogste inkomen heeft)**

Universitair / HBO / VWO / MBO / HAVO / MAVO / LTS / Weet niet

Anders, namelijk.....

9. **Past studeren op een universiteit of studeren op een HBO-instelling beter bij jou denk je?**

Universiteit / HBO / Geen van beiden / Weet niet

10. **In 2008 verdienden mensen met een MBO-opleiding gemiddeld € 25.000,- per jaar bruto (voordat er belasting wordt geheven). Wij willen graag weten wat je verwacht over de inkomens van mensen met een HBO of universitaire opleiding.**

Mensen met een HBO-opleiding hebben een inkomen van €.....per jaar bruto

Mensen met een universitaire opleiding hebben een inkomen van €..... per jaar bruto

11. **Omcirkel het soort vervolgopleiding dat je gaat volgen en het niveau van die opleiding? Indien je geen vervolgopleiding gaat volgen, omcirkel dan alleen "Geen".**

Technisch / Economisch / Maatschappelijk / Taalkundig / Geen

Anders, namelijk

Niveau: Universitair / HBO / MBO

12. In onderstaande tabel staan de mogelijke kosten van studeren. Geef bij ieder bedrag aan of jij nog zou willen studeren als je dit bedrag zou moeten betalen voor je opleiding.

Je kunt dit bedrag lenen en zodra je na je studie een inkomen hebt, terugbetalen. Je hoeft het bedrag dus niet in één keer te betalen.

Kosten van studeren	Ik ga studeren	Ik ga NIET studeren
€ 0 - € 9.999		
€ 10.000 - € 19.999		
€ 20.000 - € 29.999		
€ 30.000 - € 39.999		
€ 40.000 - € 49.999		
€ 50.000 - € 59.999		
€ 60.000 - € 69.999		
€ 70.000 - € 89.999		
€ 90.000 - € 109.999		
€ 110.000 - € 129.999		
€ 130.000 - € 149.999		

13. Geef je mening over de onderstaande stelling.

“Ik ga studeren omdat mijn vrienden/vriendinnen ook gaan studeren”

Sterk mee eens / Eens / Neutraal / Oneens / Sterk mee oneens

Hartelijk dank voor je deelname aan deze enquête!

Wil je eenmalig de resultaten van dit onderzoek ontvangen? Zet hieronder je e-mailadres of stuur een e-mail naar onderzoek2013@hotmail.com. Begin juli ontvang je dan de resultaten van het onderzoek.