



Who Earnings After Four Years' Education in Turkey: The Society or the Individual?

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Abstract

In literature, there is important evidence that earning of society in primary and secondary education is higher than that of individuals in higher education. This evidence arises from the calculations made by using benefit-cost analysis in higher education.

The purpose of this study is determine, through benefit-cost analysis, whether society or individuals benefit higher education expenses in Turkey. The study is comprised of four sections including the introduction and conclusion parts. The second section focuses on the comparative analysis of different research data by means of literature review on the social and private earnings (returns) of education. 2005 data was used in calculations and especially survey results conducted by Higher Education Institution and Turkish Education Association were utilized. In conclusion parts, it is suggested that although returns to society are high in consequence of four years' university education, individual earnings more than the society.

Keywords

Cost-benefit analysis
In higher education
Internal rate of return
technique
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Introduction

Higher education is mostly provided by state governments in most countries although its expenses gradually decrease. The reasons for this can be given as follows: protection of children, externalities of education, maintaining justice, being public good, spreading democracy, seeking common values, effect of education on economic growth, deficient capital markets, deficient acquaintance and monopolization tendencies. However, countries allocate substantial source to education and demand for education has increased rapidly in recent years. More sources are allocated to education in order to meet this demand growth. Such a development is highly important for particularly developing countries. These countries will increase education expenditures in the presence of scarce sources in order to meet increasing demand and, on the other hand, the expenditures for other public services.

Research results indicate that the society benefits from the primary and secondary stages of education, whereas individuals earning mostly from higher education (Woodhall, 1987; Coombs & Hallak, 1994:102; Asonuma, 2002: 109; Rozada & Menendez, 2002; Marcos, 2003: 541; Hans, 2005: 59; Fethke, 2005: 2; Kesik, 2005:118; Gölpek, 2008:121). These results imply that public financing needs to be provided in primary and secondary education and private financing in higher education. In

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addition, the results indicate the need to decrease the public expenses and to increase the private expenses at the higher education level. Thus by forming a relationship between the costs and returns of educational services, we need to make it certain that its returns are higher. The earnings of higher education that are reflected on both the individual and the society can be measured by the benefit-cost method. The values obtained from such measurement are significant in that they show which stage of education needs to be allocated more resources.

The purpose of this paper is to identify higher education in Turkey, using the benefit-cost method, whether the individual or the society earnings from the higher education expenses. The paper is comprised of four sections including the introduction and conclusion parts. The second section focuses on the comparative analysis of different research data by means of literature review on the social and private earnings (returns) of education. In the third section, the benefits and costs of higher education that are reflected on both the individual and the society are calculated through the internal return rate technique. The 2005 data was used in calculations. The earning flow is measured by the calculation of gross and net salaries received by high school and university graduates employed in the public sector. The earning is calculated by means of the salary figures of the State Personnel Law No 657. The earning flow of high school and university graduates was formed assuming that the government officers obtained no extra earning other than their salaries. The data for engineers' earning was obtained by means of the earning account of a university graduate. The costs were calculated separately as private and social. Social costs were calculated considering the higher education expenses paid for each student, and the private costs considering the four-year education period. Indirect costs were calculated by means of foregone earnings salaries according to State Personnel Law. The faculties of engineering formed the basis of calculation for direct private costs. In doing these calculations the following studies were benefited from: The Higher Education Council's (YÖK) research studies, *An Investigation into University Entrance System in Turkey and Recommendations* by Turkish Education Association (TED 2005). Based on the data calculated, the conclusion and discussion section emphasizes that individuals earning more than the society despite a high rate of social earnings obtained following the four-year education period.

Literature Review

Education, in a classical classification, is make individuals and society avail of various pecuniary or non-pecuniary earnings (returns). Private and social return values are emphasized in order to determine to what extent individuals and society gain the returns. In related studies, results have demonstrated that social returns in primary and secondary education and private returns in higher education predominate (Aslan 1998: 302; Psacharopoulos, 2008: 245).

Private returns are the earnings which the educated individual obtains and have no effect on society. These earnings declare themselves in a way that education enhances the educated individual's earning capacity, efficiency and employment possibility; thus the individual earnings services and goods more by generating more earning. These earnings, being defined in terms of money, are compared to private costs and defined as the individual's private rate of return (Cohn 1979:43; Woodhall, 1994: 19; Vedder, 2004: 677).

In the researches, it was observed that there is a positive relation between education and earning regardless of economic systems and development levels of the countries and high earnings are obtained particularly in higher education (Psacharopoulos, 1985: 117; Hans, 2005: 23). According to the OECD education data, in some member countries, private internal rates of return at higher education level are 13%, 8%, 11%, 7%, 18%, 9% and 19%, in average, in Belgium, Germany, Korea, Netherlands, Portugal, Italy and Turkey, respectively (OECD, 2013).

In a study performed in Turkey, it was observed that the private internal rate of return of a graduate is 23%, 8% and 28%, in average, at primary education, secondary education and higher education level, respectively (Türkmen, 2002: 37). These rates are observed to be 16% and 40% at higher education level in other studies (Kesik, 2005: 220; Gölpek, 2008: 272).

In a study conducted in the U.S.A., individuals with some college but no degree earned 14% more than high school graduates working full time year-round. Their median after-tax earnings were 13% higher. Median earnings for individuals with associate degrees working full time were 27% higher than median earnings for those with only a high school diploma. After-tax earnings were 25% higher (Baum, 2014: 11).

Social return is the earnings which the individual can not take over and reflect to the other members of the society. These earnings will be reflected as contribution to national earning by means of increase in tax earning and individual productivity (Aslan, 2002: 225). Social returns are measured with social rate of return and considered as criteria for the decisions on resource allocation in society. Thus, social rate of return measures the correlation between social costs of education which must be undertaken by the society as a whole and the expected earnings to the society (Woodhall, 1994: 20; Baum, 2007:8).

Social rate of return varies based on level of development and education level of the countries. For instance, at higher education, this rate is approximately 32% in African countries, 23% in Latin American countries, 12% in developed countries (Psacharopoulos, 2008: 249). In some Latin American countries, social internal rates of return at higher education level are 18%, 22%, 24% and 14%, in average, in Argentina, Brasil, Chile and Bolivia, respectively, at higher education level and 8%, 18%, 12% and 8%, respectively, at secondary education level (Vedder, 2004:679). In a study conducted in the Turkey, it was observed that the social internal rate of return approximately, at higher education level 33% (Gölpek, 2008: 277).

According to the OECD education data mean, social rate of return is generally lower at higher education level in the OECD countries with high income and higher in the developing countries: For example, this rate is 6%, 8%, 7% and 4% in Denmark, Canada, Netherlands and Sweden, respectively while it is 18% and 9% in Portugal and Turkey, respectively (OECD, 2013).

Methodology

Cost-benefit analysis assesses costs and benefits of education services in terms of all the individuals in a society by measuring costs and benefits of education services. In this assessment, three decision making techniques are used. These are (1) net present value (NPV), (2) internal rate of return technique (IRR) and (3) benefit cost ratio technique (B/C) (Peters 1979: 15).

Net present (current) value technique (NPV), considers time value of money and converts the flow of net benefits in time into present value terms. This technique deals with the current values of benefits and costs which investments create in their economic life. Internal rate of return technique (IRR), is based on the determination of the discount rate (r) which equalizes the current value of benefit flows to the current value of costs. Benefit and cost ratio is the ratio of the current value of benefit to the current value of investment's cost. This technique enables the choosing of the projects which have the highest benefit cost ratio and includes the rule in which the projects having benefit cost ratio below one are refused (Ataç 1978: 247).

In NPV technique, benefits and costs are reduced to present values over a certain discount rate and presented in numbers. Internal rate of return expresses the results in percentage. In general, decision making bodies do not find the solutions of the net present value which is presented in absolute numbers and tend to consider them in percentage. This is because, the numbers which are expressed in percentage provide opportunity to treat easily and perform sensitivity analysis (İşgüden 1980: 115).

The benefit which is included in the analysis comprises of the earnings which an individual gains. The earnings which an individual gains are obtained through subtracting the net earnings which an individual would gain as a high school graduate throughout his life from the earnings which the same individual would gain as a graduate. On the other hand, the cost of a graduate comprises of direct cost of the individual, the earnings which the individual waives owing to the fact that he/she prefers university to work and the expenditures which he/she bears throughout education. Period of

time includes the period starting from the age at which the individual starts working to the age at which he/she retires (Bulutoğlu 1988: 346).

Who earnings higher education expenses, consequently, four years' faculty education in Turkey has been measured through 2005 data figures were obtained by adding inflation difference to the said data. First, private and social returns and costs and then internal rate of return were calculated. The earning flow is measured by the calculation of gross and net salaries received by high school and university graduates employed in the public sector.

The earning is calculated by means of the salary figures of the State Personnel Law No 657. The earning flow of high school and university graduates was formed assuming that the government officers obtained no extra earning other than their salaries. The earning flow of high school and university graduates was formed and data pertaining earning of an engineer was obtained in earning account of a university graduate.

The costs were calculated separately as private and social by using 2005 data. Social costs were calculated considering the higher education expenses paid for each student, and the private costs considering the four-year education period. Indirect costs were calculated by means of foregone earnings salaries according to State Personnel Law. Direct private costs were calculated based on the engineering faculties.

Practice

In this part, minimum earnings and costs were calculated. Earnings were calculated as private and social; costs were calculated as direct and indirect.

Earning Data

The salary figures of the 657 numbered State Personnel Law were used to calculate the earning data. Net and gross salaries of high school and university graduate state personnel in 2005 were a basis to obtain private and social earning. Net salary and gross salary including taxes were the basis of the private earning flow and social earning, respectively. Average working period was considered as 38 years: the working periods of a four-year faculty graduate and high school graduate who were employed by the state sector as of 01.01.2005 pursuant to the 4759 numbered Law enacted as of 23.05.2002 were averaged.

Social earnings (E_s) were obtained by calculating the annual sums paid to the high school and university graduates from the figures of the State Personnel Law pertaining the salaries and making the required adjustments; private earnings (E_p) were obtained by deducting taxes and other stoppages.

Annual figures were calculated by multiplying net salary paid to the personnel by 12 and the private earning was calculated by multiplying the obtained figure by 38. The earning of a university graduate state employee was calculated over engineer staff. In a similar way, the social earning was obtained by multiplying gross salary paid to the staff by 12 and multiplying that of by 38:

a) The net salary and the gross salary of a high school graduate in January, 2005 are TL 528,04; and TL 832,67 respectively. Thus, the private earning are (E_p high school graduate) and the social earning (E_s high school graduate);

$$\left(\sum_{t=18}^{56} E_p \text{ high school graduate} \right) = \text{The net salary} \times 12 \text{ months} \times 38 \text{ years}$$

$$\left(\sum_{t=18}^{56} E_s \text{ high school graduate} \right) = \text{The gross salary} \times 12 \text{ months} \times 38 \text{ years}$$

b) The net salary and the gross salary of an engineer in January, 2005 are TL 960,53; and TL 1.287,76 respectively. Thus, the private earning are (E_p engineer) and the social earning (E_s engineer);

$$\left(\sum_{t=22}^{60} E_p \text{ engineer} \right) = \text{The net salary} \times 12 \text{ months} \times 38 \text{ years}$$

$$\left(\sum_{t=22}^{60} E_s \text{ engineer} \right) = \text{The gross salary} \times 12 \text{ months} \times 38 \text{ years}$$

Table 1. Earning Data (TL)

Earning data	High school graduate	University graduate (engineer)
Private earning	240.786,24 (528,04x12x38)	438.001,68 (960,53x12x38)
Social earning	379.697,52 (832,67x12x38)	587.218,56 (1.287,76 x12x38)

Cost Data (C)

Direct and indirect costs were calculated under this heading and it was assumed that salaries did not change in four years. In cost calculations, private and social costs were calculated, however a four year period was taken as the basis different than earning calculations.

Direct costs (DC)

Direct costs (DC) were considered as social (C_s) and private costs (C_p). Direct private cost (DCp) data and direct social cost (DCs) data were calculated according to the engineering faculty and on a 4 year basis, respectively.

Direct social cost data (DCs) is comprised of the expenses which the state makes per student. In this study, all of the formal education students studying in higher education are considered. Accordingly, the state paid TL 4.095 per student in 2005 (YÖK, 2005). It was assumed that this amount did not change (*all other things being equal*) in 4 years and the social cost figure was obtained by multiplying it by four. Thus, 4 years direct social cost of the state (DCs) is;

$$\left(\sum_{t=18}^{22} DCs \text{ engineer} \right) = \text{TL } 4.095 \times 4 \text{ years}$$

$$= \text{TL } 16.380.$$

In direct private cost (DCp) calculation, scholarship/loan made available by Yurt-Kur (2005) to the students was taken as a basis. However, different than other studies, in this study, the direct private cost of a student was calculated by considering also expenditures made by parents for ÖSS and textbooks and instruments of engineering faculty, contributions, expenditures pertaining accommodation, food and transportation. The direct private costs were obtained by multiplying the figures obtained through calculations by four.

Expenditures by parents for exam preparation come to an end when a candidate gets into a higher education program. Therefore, expenditure for ÖSS was included in direct private cost (DCp) for once. Other expenditures were calculated assuming the student graduated in 4 years (Table 2).

Table 2. Direct Private Cost (TL)

Expense Items	Total Expense (TL)
Preparation for ÖSS	3.096
Wear 400 TL x 4 years	1.600
Book 519,39 TL x 4 years	2.077
Accommodation (Yurt-Kur) ... 270 TL x 4 years	1.080
Food 240 TL x 4 years	960
Transportation 408 TL x 4 years	1.632
Contribution 300 TL x 4 years	1.200
Total Sums	11.645

Source: TED (2005). *Türkiye’de üniversiteye giriş sistemi araştırması ve çözüm önerileri*. Ankara: TED Yayınları.

Öğrenci Kolektifleri (2005). Üniversite dosyası. <http://www.kolektif.org/index.php>

YÖK (2005). *Türkiye’nin yükseköğretim stratejisi- taslak rapor*. <http://www.yok.gov.tr/egitim/raporlar/mart2005/b3.html>

Indirect costs (IC)

Indirect costs (IC) were considered as social (ICs) and private (ICp) costs. The student who prefers studying at university to working would generate earning and pay tax to the state in the event that he worked. Consequently, the state loses revenue and this revenue loss is a social cost component: in indirect social cost (ICs), the gross salary, including taxes, paid by the state to a low-grade (9/1) high school graduate according to the State Personnel Law in 2005 was taken as the basis. This amount was assumed not to change in 4 years. Within this framework, the indirect social cost figures were obtained by multiplying monthly gross salary (TL 832,67) by 12 and then multiplying the result by four (Table 3). Thus, 4 years indirect social cost (ICs);

$$\left(\sum_{t=18}^{22} ICs \text{ high school graduate} \right) = \text{The gross salary} \times 12 \text{ months} \times 4 \text{ years}$$

In indirect private cost (ICp) calculation, the minimum salary for high school graduates indicated by the State Personnel Law of 2005 was considered waived revenue in parallel with the previous studies on the subject and it was assumed not to change in 4 years. Annual cost was obtained by multiplying the net salary (TL 528,04) which a high school graduate earns after taxes and deductions by 12 and then the wanted figure was calculated by multiplying the former figure by four (Table 3). Thus, the indirect private cost (ICp) of a higher education graduate is;

$$\left(\sum_{t=18}^{22} ICp \text{ high school graduate} \right) = \text{The net salary} \times 12 \text{ months} \times 4 \text{ years}$$

Table 3. Indirect Cost Data (TL)

	High school graduate
Indirect social cost (ICs)	39.968,16 (832,67x12x4)
Indirect private cost (ICp)	25.345,92 (528,04x12x4)

Total costs (TC)

Total private (TCp) and social costs (TCs) were calculated by means of the results of the direct private (DCp) and direct social costs (DCs); indirect private (ICp) and indirect social costs (ICs) which are required for total costs (TC).

Total private cost (TCp) is comprised of the sum of direct (DCp) and indirect private cost (ICp). In indirect private cost calculation, the minimum direct private cost, by assuming the student

stays at the state dormitory, and the minimum salary paid to high school graduates were taken as the basis (Table 2). Indirect private cost (ICp) was assumed to be fixed and direct private cost (DCp, Table 3) was calculated according to the engineering faculty. Within this framework, total private cost (TCp) of a student who is registered at the engineering faculty was calculated by means of the formulation below and direct (DCp, Table 2) and indirect private costs (ICp) data (Table 4):

$$\sum_{t=18}^{22} TCp = \sum_{t=18}^{22} DCp + \sum_{t=18}^{22} ICp$$

Total social cost (TCs) is comprised of the sum of direct (DCs) and indirect social cost (ICs, Table 3) plus direct private cost (DCp, Table 2). In total social cost (TCs) calculation, only direct private cost differs and other costs remains stable. Thus, total social cost (TCs) was calculated by means of the below formulation:

$$\sum_{t=18}^{22} TCs = \sum_{t=18}^{22} DCs + \sum_{t=18}^{22} ICs + \sum_{t=18}^{22} DCp$$

Table 4. Total Cost Data (TL)

Cost data (TL)	University graduate (engineer)		
	Direct private cost (DCp)	Indirect private cost (ICp)	
	11.645	25.345,92	
Total private cost (TCp)	36.990,92		
	Direct social cost (DCs)	Indirect social cost (ICs)	Direct private cost (DCp)
	16.380	39.968,16	11.645
Total social cost (TCs)	67.993,16		

Internal Rate of Return (IRR)

Internal rate of return is the discount rate which equals costs to return and calculated by using the below formulation (Sheehan, 1973: 13; Cohn 1979: 97).

$$IRR: r = \sum_{t=0}^n \text{return}^t / (1+r)^t - \text{cost} = 0$$

The “r”, the “return” and the “C” in the formulation indicate internal rate of return, earning difference and cost, respectively. The equations used in internal rate of return are the equation of 38th degree because n=1,2,3,4,...,38. Due to the fact that there is the square root of 38, both the solution and analyzing the roots are difficult, mathematically. Therefore, a special process was applied to the solution of IRR. Internal rate of return (r) means that earning value is equal to cost. By definition, while obtaining r, cost-earning difference is approximated to zero by giving different values to r. Interpolation is made to find the real rate approximating to zero (Akalin, 1980:132; Akgüç, 1994:350). Excel program is utilized for the interpolation operations.

Private internal rate of return (IRRp)

Private internal rate of returns (IRRp) and total private costs (TCp) are included in internal rate of return (IRR) account. Private return and private costs are figured in dividend and denominator parts of the internal rate of return formulation, respectively. Internal rate of return values was obtained by means of the below formulation (Sheehan, 1973: 14; Cohn 1979: 98):

$$IRRp = r$$

$$r = \sum_{t=22}^{60} \text{private return}^t / (1+r)^t - \text{private cost} = 0$$

Here, total private cost amount is TL 36.990,92 and social rate is considered as (r) 40%. Accordingly, private internal rate of return was calculated by doing interpolation within the frame of costs and earnings which an engineering graduate working at the public sector as an engineer will gain until he is retired (Appendix A. Table 5).

$$IRR_p = r$$

$$\begin{aligned} r &= 40\% \\ &= -36.991 + 45.409,91 \\ &= +8.418,91 \end{aligned}$$

$$\begin{aligned} r &= 47\% \\ &= -36.991 + 34.536,34 \\ &= (-) \end{aligned}$$

$$\text{Difference..... } 10.873,57 \text{ (45.409,91- 34.536,34)}$$

$$r = 40\% + [(+8.419 \times \%7) / 10.873,57]$$

$$r = 0,40 + 0,05419$$

$$r = 0,4541$$

$$r = 45,41\%$$

Social internal rate of return (IRRs)

The methodology used in calculation of private internal rate of return was also used in social internal rate of return (Appendix B. Table 6). Internal rate of return values was obtained by means of the below formulation:

$$IRR_s = r$$

$$r = \sum_{t=22}^{60} \text{social return}^t / (1+r)^t - \text{social cost} = 0$$

$$IRR_s = r$$

$$\begin{aligned} r &= 30\% \\ &= -67.897,16 + 78.847,15 \\ &= +10.853,99 \end{aligned}$$

$$\begin{aligned} r &= 35\% \\ &= -67.993,16 + 60.176,72 \\ &= (-) \end{aligned}$$

$$\text{Difference } 18.670,43 \text{ (78.847,15- 60.176,72)}$$

$$r = 30\% + [(10.853,99 \times \%5) / 18.670,43]$$

$$r = 0,30 + 0,0290$$

$$r = 0,329$$

$$r = 32,9\%$$

A commissioned public officer who is a four-year faculty graduate and working as an engineer earns approximately 45% in consequence of higher education expenditures while society earns approximately 33%. Although the earning of higher education expenditures reflected on society is high, the officer still earns more. The findings obtained in the study are consonant with the results of previous studies performed related to the subject which suggest that it is the society who earnings in primary and secondary education and it is the individual who earnings in higher education.

Conclusion

The fact that private returns are more than social returns in higher education manifests that higher education has the characteristics of private good rather than public good. However, higher education is considered as public good and most of expenditures are covered from public resources. This reduces private education costs, consequently, increases private earnings and creates increase in demand.

The fact that private rate of return and social rate of return are approximately 45% and 33% respectively, clearly demonstrates it. This result leads that engineering faculties are demanded more compared to the others. As a matter of fact, engineering was the first choice according to ÖSYM data of 2005 and approximately 22% of the candidates who want to get higher earnings stated that they intended to study engineering according to a survey conducted by TED in the same year (2005).

It is very apparent that the said figure will be higher than 45% with the quantification of such components which can not be calculated by economical parameters like enabling higher consumption rates which brings personal prestige. It was assumed that an engineer obtains no extra earning other than the salary. However, this occupational group can obtain extra earning by working as a freelancer even if he has a full-time job. This additionally increases the earning gap between high school graduate and university graduate. Considering that a university graduate will gain higher earning in private sector and the supplementary payments and social rights, it can be suggested that both rates of return will increase and particularly private rate of return will exceed 45%. Thus, actually, the private rate of return can be said to be several points higher than it is.

Considering the earnings which can not be measured with money, it is evident that private rate of return is higher than social rate of return, in any case. This finding reveals the reason for the excess demand in higher education. In other words, increase in demand takes its source from the fact that private rate of return is high but private costs are low. Main reason for the fact that costs are low is that higher education is provided freely because it is considered as public good by the state. This practice causes the higher education which is high cost is demanded by individuals a lot. Nevertheless, it can be stated that higher education is a profitable investment in a social sense.

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Appendix 1. Table 5. Private Internal Rate of Return (%)

Years	Private Returns (TL)	r=%40	Present Value 1 (TL)	r= %47	Present Value 2 (TL)	r= %45	Present Value 3 (TL)
1	5189,88	0,714286	3707,057	0,680272	3530,5306	0,6896552	3579,228
2	10379,8	0,510204	5295,796	0,46277	4803,443	0,4756243	4936,866
3	15569,6	0,364431	5674,067	0,31481	4901,4725	0,3280167	5107,102
4	20759,5	0,260308	5403,873	0,214156	4445,78	0,2262184	4696,186
5	25949,4	0,185934	4824,887	0,145684	3780,4252	0,1560127	4048,436
6	31139,3	0,13281	4135,617	0,099105	3086,0614	0,107595	3350,43
7	36329,2	0,094865	3446,348	0,067418	2449,2551	0,0742034	2695,748
8	41519	0,06776	2813,345	0,045863	1904,1827	0,0511748	2124,728
9	46708,9	0,0484	2260,724	0,031199	1457,2827	0,035293	1648,496
10	51898,8	0,034572	1794,225	0,021224	1101,4986	0,02434	1263,215
11	57088,7	0,024694	1409,748	0,014438	824,25069	0,0167862	958,3011
12	62278,6	0,017639	1098,505	0,009822	611,68882	0,0115767	720,9789
13	67468,4	0,012599	850,0338	0,006682	450,79108	0,0079839	538,6624
14	72658,3	0,008999	653,8722	0,004545	330,24988	0,0055061	400,0675
15	77848,2	0,006428	500,4124	0,003092	240,70691	0,0037973	295,6164
16	83038,1	0,004591	381,2666	0,002103	174,66261	0,0026189	217,4649
17	88228	0,00328	289,3541	0,001431	126,24423	0,0018061	159,3493
18	93417,8	0,002343	218,8392	0,000973	90,93222	0,0012456	116,3606
19	98607,7	0,001673	164,9978	0,000662	65,295245	0,000859	84,70692
20	103798	0,001195	124,0585	0,00045	46,756352	0,0005924	61,49322
21	108987	0,000854	93,04389	0,000306	33,397394	0,0004086	44,52958
22	114177	0,00061	69,62468	0,000208	23,801188	0,0002818	32,17244
23	119367	0,000436	51,99246	0,000142	16,927252	0,0001943	23,19643
24	124457	0,000311	38,72103	9,65E-05	12,006149	0,000134	16,67968
25	129747	0,000222	28,83344	6,56E-05	8,5145942	9,24E-05	11,99216
26	134937	0,000159	21,41913	4,46E-05	6,0239315	6,37E-05	8,601272
27	140127	0,000113	15,88781	3,04E-05	4,255524	4,40E-05	6,160061
28	145317	8,10E-05	11,76875	2,07E-05	3,0021333	3,03E-05	4,405663
29	150507	5,78E-05	8,706473	1,41E-05	2,1152057	2,09E-05	3,146902
30	155696	4,13E-05	6,433355	9,56E-06	1,4885332	1,44E-05	2,245115
31	160886	2,95E-05	4,748429	6,50E-06	1,0463612	9,95E-06	1,599967
32	166076	2,11E-05	3,501145	4,42E-06	0,734772	6,86E-06	1,13902
33	171266	1,51E-05	2,578969	3,01E-06	0,515465	4,73E-06	0,810079
34	176456	1,08E-05	1,897942	2,05E-06	0,3612824	3,26E-06	0,575604
35	181646	7,68E-06	1,395546	1,39E-06	0,2529989	2,25E-06	0,408644
36	186836	5,49E-06	1,025299	9,47E-07	0,1770255	1,55E-06	0,289876
37	192026	3,92E-06	0,7527	6,45E-07	0,1237706	1,07E-06	0,205467
38	197215	2,80E-06	0,552173	4,38E-07	0,0864733	7,38E-07	0,145531
			45.409,91		34.536,34		37.161,74

Appendix 2. Table 6. Social Internal Rate of Return (%)

Years	Social Returns (TL)	r= %40	Present Value 1 (TL)	r= %30	Present Value 2 (TL)	r=%35	Present Value 3 (TL)
1	5461,08	0,714286	3900,771	0,769231	4200,831	0,740741	4045,244
2	10922,16	0,510204	5572,531	0,591716	6462,817	0,548697	5992,955
3	16383,24	0,364431	5970,569	0,455166	7457,096	0,406442	6658,839
4	21844,32	0,260308	5686,256	0,350128	7648,304	0,301068	6576,631
5	27305,4	0,185934	5077,014	0,269329	7354,138	0,223014	6089,473
6	32766,48	0,13281	4351,726	0,207176	6788,435	0,165195	5412,865
7	38227,56	0,094865	3626,439	0,159366	6092,185	0,122367	4677,784
8	43688,64	0,06776	2960,358	0,122589	5355,767	0,090642	3960,029
9	49159,72	0,0484	2379,343	0,0943	4635,742	0,067142	3300,696
10	54610,8	0,034572	1887,983	0,072538	3961,366	0,049735	2716,069
11	60071,88	0,024694	1483,416	0,055799	3351,925	0,036841	2213,094
12	65532,96	0,017639	1155,908	0,042922	2812,805	0,027289	1788,358
13	70994,04	0,012599	894,4528	0,033017	2344,004	0,020214	1435,102
14	76455,12	0,008999	688,0406	0,025398	1941,778	0,014974	1144,811
15	81916,2	0,006428	526,5617	0,019537	1600,367	0,011092	908,5802
16	87377,28	0,004591	401,1899	0,015028	1313,121	0,008216	717,8905
17	92838,36	0,00328	304,4744	0,01156	1073,224	0,006086	565,0064
18	98299,44	0,002343	230,2748	0,008892	874,1193	0,004508	443,1423
19	103760,5	0,001673	173,6199	0,00684	709,755	0,003339	346,4899
20	109221,6	0,001195	130,5413	0,005262	574,7004	0,002474	270,1675
21	114682,7	0,000854	97,90595	0,004048	464,1811	0,001832	210,1303
22	120143,8	0,00061	73,26296	0,003113	374,0653	0,001357	163,0641
23	125604,8	0,000436	54,70935	0,002395	300,8218	0,001005	126,2786
24	131065,9	0,000311	40,77716	0,001842	241,4623	0,000745	97,60663
25	136527	0,000222	30,34015	0,001417	193,4794	0,000552	75,31376
26	141988,1	0,000159	22,53839	0,00109	154,7835	0,000409	58,01949
27	147449,2	0,000113	16,71804	0,000839	123,6436	0,000303	44,63038
28	152910,2	8,10E-05	12,38373	0,000645	98,63311	0,000224	34,28397
29	158371,3	5,78E-05	9,161435	0,000496	78,58132	0,000166	26,30251
30	163832,4	4,13E-05	6,769533	0,000382	62,53155	0,000123	20,15518
31	169293,5	2,95E-05	4,99656	0,000294	49,70457	9,11E-05	15,42742
32	174754,6	2,11E-05	3,6841	0,000226	39,46765	6,75E-05	11,79636
33	180215,6	1,51E-05	2,713734	0,000174	31,30847	5,00E-05	9,011106
34	185676,7	1,08E-05	1,99712	0,000134	24,81324	3,70E-05	6,877163
35	191137,8	7,68E-06	1,468471	0,000103	19,64849	2,74E-05	5,244024
36	196598,9	5,49E-06	1,078877	7,91E-05	15,54606	2,03E-05	3,995447
37	202060	3,92E-06	0,792032	6,08E-05	12,29069	1,51E-05	3,041801
38	207521	2,80E-06	0,581028	4,68E-05	9,7099	1,12E-05	2,314083
			47.783,35		78.847,15		60.176,72