



Global Development Network

Strengthening
Institutions
to Improve
Public Expenditure
Accountability

Policy Simulation Analysis in the Education Sector

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Introduction and Background

The last two decades of economic and social downturn have impacted the higher education sector in the country. Access to higher education is now strongly correlated with the level of poverty of the household. This, in turn, impacts the ability of households to come out of poverty, and so on. A number of factors have contributed to this situation. Some of them relate to the education system, while others relate to access of potential beneficiaries to financial resources.

About 111,000 students are enrolled in higher education in Armenia, of which 91,400 are enrolled in public universities and 19,600 in private universities. Of the 91,400 students enrolled in public universities, only 19,600 receive government allowances (scholarships) for study. The remaining 72,800 students pay tuition fees. Furthermore, there is only one grade of scholarship: 100 percent for all 19,600 students.

Based on an earlier study by our team, it was found that there is a significant misbalance of distribution of higher education to the lowest quintile of the population while benefit incidence of other types of education did not show a trouble behavior¹. Therefore, a policy adjustment is required to address the key factors that limit access to higher education by the beneficiaries of the lowest quintile.

The misbalance mentioned above is believed to be the result of the principle of 100 percent merit-based distribution of government subsidies to university students. This principle is a carry-over from the Soviet era and no changes were brought about. This, despite the fact that as compared to earlier times, more than 80 percent of students are fee-paying, while government resources cover only about 20 percent of the students.

The Benefit Incidence Analysis for the Armenian education system conducted in 2009-2010 by Advanced Social Technologies NGO revealed a highly inequitable distribution of government subsidies in higher education by income quintiles. The poorest quintile received about 8 percent of available subsidies, whereas the richest quintile received about 40 percent².

This inequity in distribution of government subsidies can be attributed to the large gap between the enrollment rates of the poorest and richest quintiles: 8 percent and 38 percent, respectively.

Data in Figures 1 and 2 show similar results, which proves the link between the distribution of enrollment and the distribution of government subsidies.

¹ More details are given in the section on 'Literature Review'.

² Benefit Incident Analysis, page 15.

Figure 1. Benefit Incidence for Higher Education across Quintiles, 2009

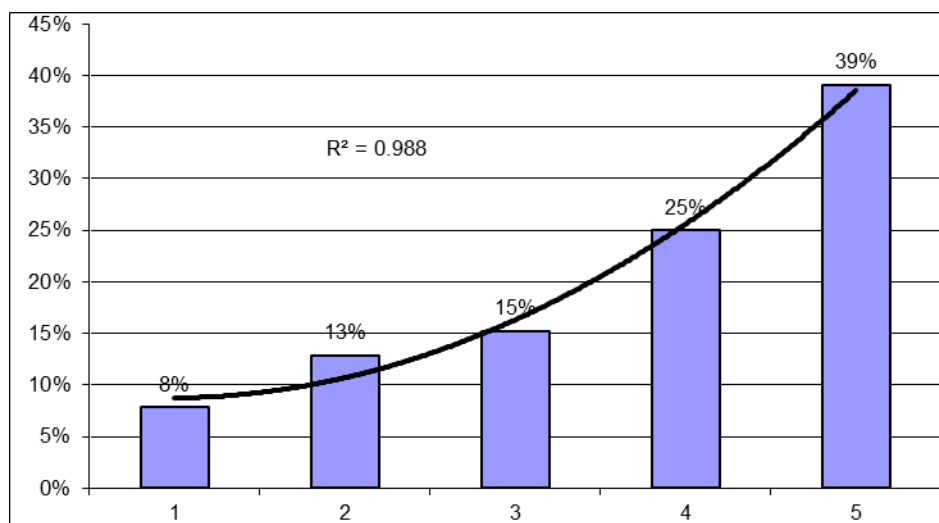
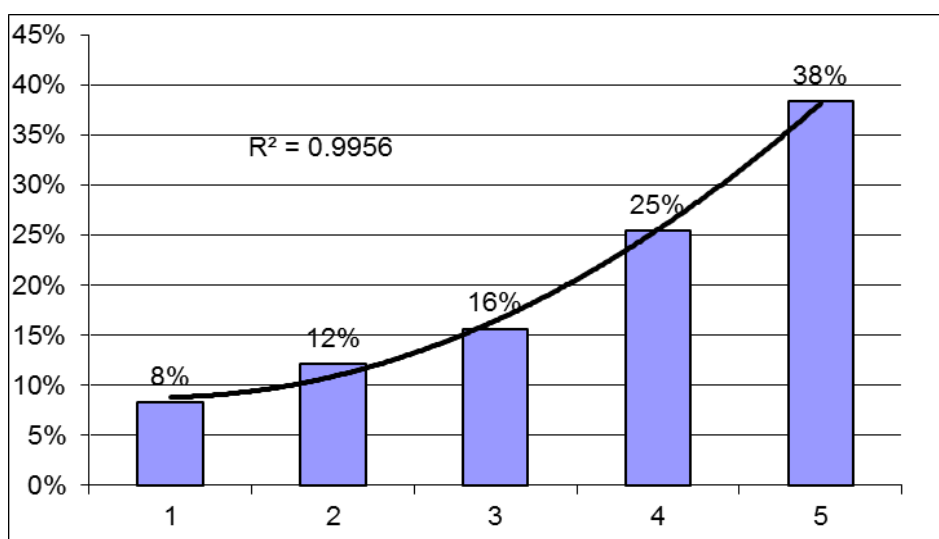


Figure 2. Distribution of Enrollment for Higher Education across Quintiles, 2009



This disproportionate enrollment across income quintiles is assumed to be a combined effect of unequal access to high quality upper secondary (high school) education; lack of the means to study for university entrance examinations through tuitions; the absence of a pro-poor policy in the mechanism of distribution of government scholarships to students; and lack of alternative sources of funding university study for low and middle income students.

This paper attempts to address this issue by looking at the various factors (such as the pre-university system, access to finances, and enrollment criteria for government subsidy) that drive the different income groups in making decisions on high education enrollment. The paper will also try to provide a rationale for policy changes and present policy options that

will improve the inequity in access to higher education. And finally, we will try to assess the possible impact of each intervention and its aggregate effect.

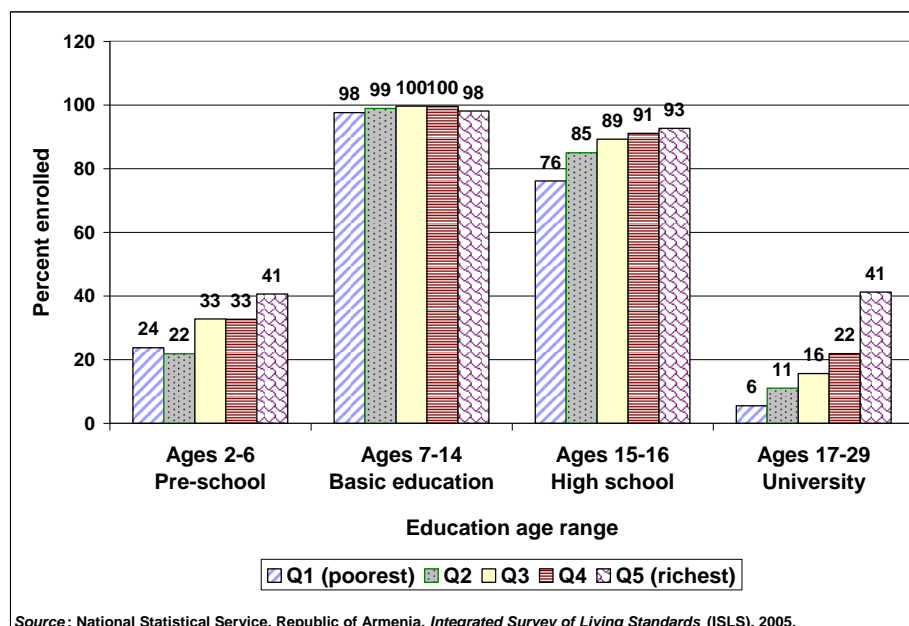
The simulation analysis conducted assesses the possible impact of the recommended policy actions on enrollments that include establishment of a separately operating high school system, provision of merit and need based scholarships, and a Student Loan Program as a means of increasing the participation of low-income groups in higher education.

Literature Review

According to the *Public Expenditure Review for Education Sector of Armenia*, prepared by the World Bank in May 2008, university enrollment in Armenia is unequally distributed among households, with the rich households being over-represented. Figure 3 below shows the distribution of enrollment at different education levels among 5 income quintiles of the population³.

Nearly 100 percent of children in basic education (grades 1-8) for all quintiles are enrolled at some level of education (pre-primary to lower secondary). There are clear disparities in preschool and upper secondary (high school) education, and they become even wider in tertiary education.

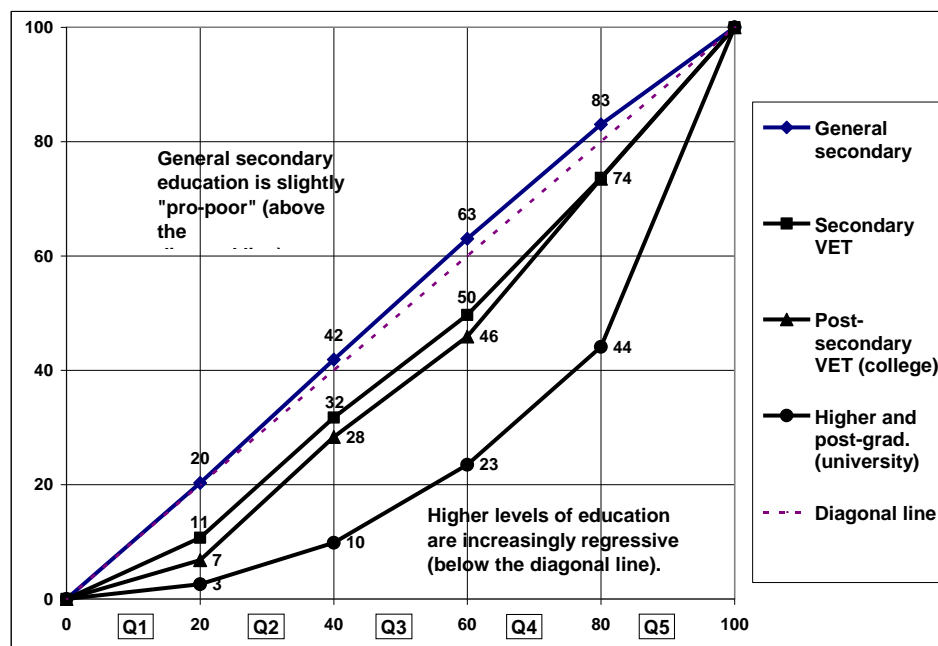
Figure 3: Enrollment Rates for Different Education Levels, 2005



³ Public Expenditure Review for Education Sector of Armenia, World Bank, May 2008, Chapter 5. Equity, pages 42-43.

The national statistics data also supports this finding. According to Figure 4, general secondary education is quite equally distributed, actually, slightly 'pro-poor', with the poorest 40 percent of households comprising 42 percent of enrollments. However, university enrollments in Armenia are quite unequally distributed among households, skewed in favour of the rich households.

Figure 4: Distribution of Enrollment at Different Education Levels by Households, 2005

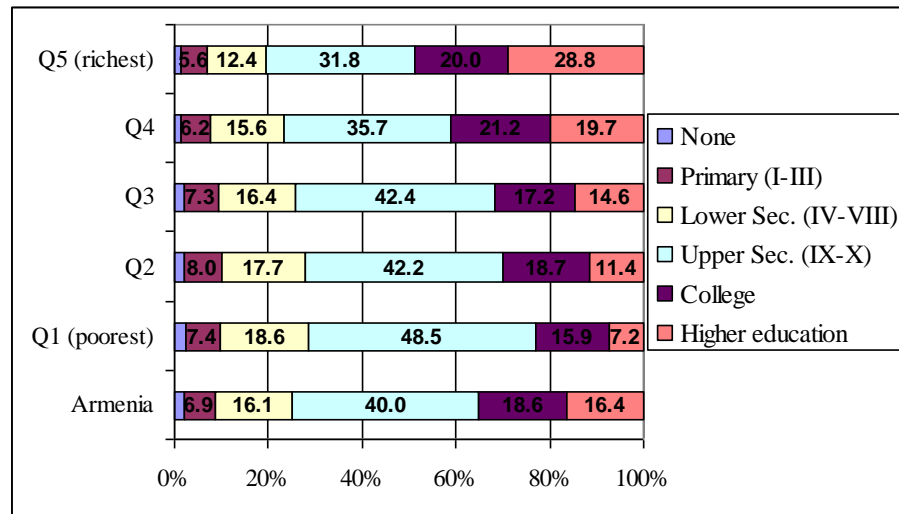


Source: National Statistical Service, *Integrated Survey of Living Standards (ISLS)*, 2005.

Taking the entire population into account, Figure 5 below shows that individuals from poorer households attained lower levels of education in the past. For example, only 7.2 percent of individuals from the poorest quintile have availed of higher education as compared with 28.8 percent of those from the richest quintile⁴.

⁴ *Public Expenditure Review for Education Sector of Armenia*, World Bank, May 2008, Chapter 5. Equity, page 41.

Figure 5: Individuals from Poorer Households Have Attained Lower Levels of Education, 2005



Source: National Statistical Service, *Integrated Survey of Living Standards (ISLS)*, 2005.

Note: Individuals who are six years and older are covered.

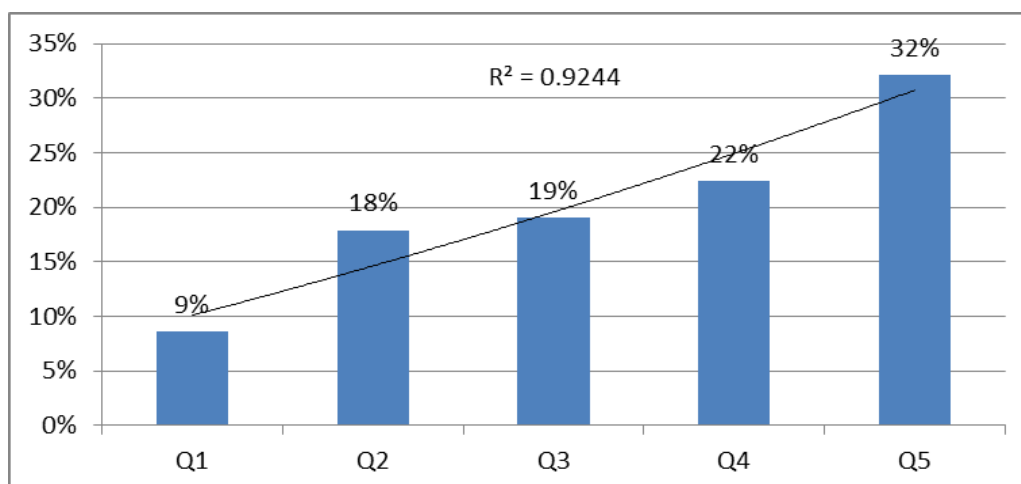
This trend represents unequal opportunities for the poor and the rich to prepare for entering universities, as well as the lack of a pro-poor state policy in allocation of state subsidies for higher education.

This inequality in turn is assumed to be the result of a combination of factors:

- i. Poor quality of education in higher grades (10-12) of general secondary schools (schools that provide general education from grades 1 to 12, which is currently the largest portion of schools in Armenia), especially in rural areas. As a result, students from richer households can compensate for poor quality education by paying for private tuitions;
- ii. Lack of pro-poor distribution mechanisms in allocation of government allowances (scholarships) to university students; and;
- iii. Absence of alternative sources of financing for students from low income families.

The most recent household survey conducted in May 2011 by Advanced Social Technologies NGO in the framework of development of policy simulation analyses in the sectors of education, health and water in Armenia once again revealed an inequitable distribution of enrollment in higher education among income quintiles of the population. Figure 6 below represents the results of the survey. When comparing these results with the previous surveys we can see that there was an improvement in enrollment distribution for the second and third quintiles at the expense, partly, of the fourth quintile, and mainly the fifth quintile. However, there was almost no improvement in the first (poorest) quintile. Although this needs to be proven for the long term, it can be assumed that the policy actions undertaken during recent years were more effective for the middle quintiles and less effective for the poorest one.

Figure 6: Distribution of Enrollment in Higher Education among Households, 2011



A comparative analysis of the Benefit Incidence Reports prepared in 2009 by all 15 member organizations of the project on “Strengthening Institutions to Improve Public Expenditure Accountability” revealed an unequal distribution in university enrollment in almost all countries (See Table 1). As the Table shows, even with such problematic enrollment distribution, Armenia has the third best distribution among the 15 countries.

Table 1. Distribution of University Enrollment among Income Quintiles for GDN Project Member Countries

	Q1	Q2	Q3	Q4	Q5
India	18.06	26.65	20.17	19.80	15.32
Argentina	8.28	13.08	19.70	29.58	29.36
Armenia	8.20	12.43	17.40	24.32	37.65
Philippines	7.25	12.61	19.01	28.34	32.79
Guatemala	5.86	6.48	11.22	15.09	61.35
Peru	4.93	8.75	12.05	25.01	49.25
Indonesia	4.88	6.54	7.59	15.65	65.34
Bangladesh	4.32	9.25	14.94	22.17	49.31
Uganda	3.71	5.85	6.00	15.37	69.08
Nepal	3.45	3.45	6.90	15.52	70.69
Mexico	2.39	7.01	14.70	24.80	51.09
Tanzania	2.13	9.74	15.65	15.78	56.69
Ghana	1.70	5.50	15.90	19.80	57.10
Kenya	0.00	2.80	2.80	15.10	79.30

The most interesting results in terms of equity in enrollment distribution are demonstrated by India, where the share of the poorest quintile is even higher than the share of the richest quintile. Although the report mentions that enrollment data include only public schools and university, it can be assumed that there are effective policies in place that ensure equal opportunity for poorer families to benefit from public higher education. However, there might be additional reasons for such a pattern in the benefit incidence.

As of 2009, total public expenditure on higher education in Armenia was 7,867 mln Armenian drams, equivalent to 21.65 mln US\$, which in the same year was about 7.3 percent of public expenditure on the education sector, about 0.85 percent of total public expenditure, and about 0.25 percent of nominal GDP for 2009⁵. In contrast to these figures, the average public expenditure on higher education for OECD countries in 2009 was about 23.8 percent of public expenditure on the education sector, about 3.1 percent of total public expenditure, and about 1.4 percent of nominal GDP⁶. This comparison shows a huge difference in public financing of higher education between Armenia and OECD countries.

Besides, this financing goes to the higher education sector in the form of merit-based scholarships for about 20,000 students, leaving the burden of tuition fees for about 73,000 students of public universities on the shoulders of households (which comprises about 78 percent of total higher education expenditure). Again, when compared with Armenia, about 55 percent of university students in OECD countries receive public financial support, from which 16 percent is in the form of student loans, 26 percent in the form of scholarships/grants, and 13 percent in both forms. Moreover, financial support to students and household comprises only 21 percent of public expenditure on higher education, with the remaining funds going directly to universities.

Policy Goal and Alternatives

The goal of the policy simulation analysis is to identify the optimal intervention pattern for the government to achieve at least 15 percent enrollment in higher education for the poorest 20 percent of the population.

The team has identified policy alternatives that individually address the policy question. Although these alternatives are individually assessed, the government could choose an intervention mix that best fits the proposed objective, i.e. *increase the percentage of enrolled beneficiaries from the lowest quintile*. In making such a decision, the government must have clarity on the relative effectiveness of each alternative (e.g. what will it cost to increase the percentage of enrollment for the 1st quintile by 1 percentage point). This policy simulation tries to model and identify this relationship and will subsequently share it with the government.

⁵ Program Budgeting Analysis, 2010.

⁶ *Education at a Glance*, 2012, OECD Indicators, http://www.oecd.org/edu/EAG%202012_e-book_EN_200912.pdf

Unfortunately, the surveys of the World Bank, UNESCO and OECD education data did not provide data on university enrollment distribution among income quintiles for us to compare our 15 percent benchmark. Our benchmark is therefore somewhat provisional, but the experience of India as discussed above provides us with some room to assume that our benchmark is quite realistic.

High School Program

As already mentioned, poor quality of education in higher grades of general secondary schools, especially in rural areas, is responsible for a larger gap between students from poorer and richer families in their level of preparedness to successfully pass university entrance exams and get state allowances or scholarships for higher education. This is because richer families can afford to hire private tutors to prepare their children for university examinations, whereas the poorer families usually cannot afford to.

In order to improve the quality of education in higher grades of general education schools, the Armenian government decided to establish a network of separately operating high schools by selecting about 100 to 150 general secondary schools from across the country and transforming them into separately operating high schools that in future will have only the higher grades (10 to 12). The remaining grade 12 general schools which surround the new high schools were transformed into basic schools (for grades 1 to 9). This process assumes massive investment in the facilities of those high schools, new textbooks, new curricula, teacher training and attestations, as well as increased financing for recurrent costs. Small and very remote villages with only one school will retain their general secondary schools (grades 1 to 12). The government has just started investing in this project, and its successful completion substantially depends on realistic measurement of further investments needed and the political will to allocate the resources to the implementation.

The results of the 2009 university entrance exams showed that about 64 percent of newly established high schools applied to universities and about 58 percent were admitted, whereas the same indicators for the whole country were about 41 percent and 28 percent, respectively.

Thus, the government's policy interventions in the area of improving the quality of high school education show a relationship with the overall policy objective as discussed in this paper.

State Allowance for University Students

The current system of state allowances for higher education is mostly merit-based, i.e. allowances are granted to applicants with the best results in entrance exams. Furthermore, the government decides on the number of grantees per specialty for each state university prior to the entrance exams. One of the main improvements in this system was the

introduction of the rotation principle in the higher grades of university study: the allowances now migrate from students with lower performance to students with the best performance, based on annual results of exams.

However, the current merit-based state allowance system does not take into account the real needs of the recipient's family, as a result of which students dropout from universities for financial reasons. These dropouts can be categorized into the types:

- i. Those who quit universities midway because of their inability to pay their tuition fees;
- ii. Those who are admitted to universities, but are not granted state allowances and cannot find resources even for the first-year tuition fee; and
- iii. Those who decide not to apply to universities because of a lack of resources, hoping that they will receive state allowances.

In fact, the majority of recipients of government support belong to the richest two quintiles as they have the additional advantage of getting tuitions to prepare for university admission prior to their application. In any event, there is a need to review the system to factor in the level of family income, both at the stage of university entrance and in the rotation mechanism.

According to the Public Expenditure Review of the Armenian education sector conducted by the WB in 2008, the current financing scheme which is mostly merit-based has resulted in inequitable distribution of public funds for higher education. The predominantly merit-based selection for recipients of state scholarships and stipends has benefited wealthier students disproportionately; 40 percent of the stipends go to students from the wealthiest quintile who most certainly do not need it. Inequitable provision of scholarships has limited access to higher education among students from poor households⁷. This financing scheme is based on historical allocations to universities, faculties, and specializations and stipends, resulting in inequitable and ineffective distribution of public funds. Moreover, it covers only part of the actual cost per student, thus creating a dual fee structure for scholarship and non-scholarship holders, and offers universities little incentive to improve their performance⁸. The new financing system should combine several types of direct funding to state universities and better targeted scholarships for the needy⁹. Moreover, universities need to explore other funding sources such as income generation activities and contributions from the private sector.

This policy simulation analysis suggests the introduction of merit- and need-based financing as a means to increase enrollment of students from lower income groups and measures the possible impact of the proposed policy on distribution of university enrollment among income quintiles.

⁷ *Armenia Education Public Expenditure Review*, Chapter 8. Conclusions and Recommendations, page 72.

⁸ *Armenia Education Public Expenditure Review*, Chapter 8. Conclusions and Recommendations, page 75.

⁹ For example, Salmi & Hauptman (2006) analyze various allocation mechanisms for higher education.

The new need-based financing scheme will supplement the current merit-based scheme to increase the share of public expenditure in total higher education expenditure and will be designed so as to effectively identify only those students from low income families. The existing poverty level definition toolkit (family benefit) could be used as a basis for identifying who is in need of allowances for education and at what level. This will avoid the need to invent a new scheme for the task, which will decrease both costs and the time needed to develop and test a new scheme.

The proposed system will set the minimum threshold for academic achievement (entrance and annual exam results) and will grant to those who pass this threshold some points in the family benefit system to access the student allowance. The scholarship will cover 20 to 100 percent of tuition fees, depending on the level of poverty of the family, as well as available funds for scholarship assistance.

State Program for Student Loans

There are few sources for financing university study other than parental payments of fees and state allowances. Some Armenian commercial banks provide loans for students, but these are more like consumer loans with high interest rates and terms not affordable by lower income families.

To fill the gap of affordable alternative financing for higher education, including tuition fees and other learning costs, a student loan scheme that would target those really interested in the learning process could be considered.

According to the PER and research done under the Second Education Quality and Relevance Project financed by the World Bank, it is recommended that the government consider introducing a state-backed student loan scheme as an alternative mechanism for financing higher education; it is hoped that such a scheme will broaden access to higher education for students from poorer households¹⁰.

This is again a policy action that the government needs to consider, discuss and decide on whether it is in line with the policy option and can be realized within the framework of terms proposed by this paper.

Overall, the government needs to better target the limited public funds for the poor through direct scholarships to them, provide other financing options such as a well-designed student loan scheme for the needy, make the bases for funding more flexible and demand-driven, and link criteria for direct funding to universities with their performance.

In this regard, student loans can serve as an additional financing tool to cover university tuition fees. As in the case of scholarships, the new student loan scheme will be designed in a way to effectively identify students from low income families. The government will

¹⁰ *Armenia Education Public Expenditure Review*, Chapter 8. Conclusions and Recommendations, page 75.

establish a Student Loan Development Agency which will be responsible for developing lending technology and procedures, and will cooperate with commercial banks as lending institutions in the allocation of government funds and provision of loans to applicants.

The interest rate will be set to cover the cost of capital for the government, interest margin for risk premium, loan processing costs and the operating costs of the Agency. The government will subsidize interest payments during the study period and for an after-study grace period of a year to give them time to find jobs. The terms of the loan will be flexible in repayment schedules to avoid possible defaults.

Methodology

This policy simulation analysis report further explores sector-specific issues and presents an assessment of the potential effectiveness of policy interventions (mix of interventions) that will be aimed at decreasing the dependence of higher education services on financial capacities of families. Based on previous activities, the team tried to assess:

- i. How much the interventions will cost and how affordable it would be for the government to pay;
- ii. Relevance of policy interventions to policy statements and objectives declared by the relevant political documents;
- iii. Possible shifts in benefit incidence over the mid- or long term, based on the results of the recent survey by AST to identify the possible effectiveness of interventions;
- iv. Ways for monitoring the effectiveness of the policy interventions by the government agencies;
- v. Synopsis of the above with recommendations to government agencies on policy adjustment.

Description of cost data for the proposed programs

High School Program

- The following data were used to calculate High School Program cost:
 - I. For capital costs, the actual costs for 2008, 2009, 2010 and 2011 were analyzed from the following sources:
 - a. First and Second Education Quality and Relevance Projects financed by the World Bank;
 - b. State Budget of Armenia;
 - c. Textbook Revolving Fund.

- II. The following breakdown of the capital costs was used:
 - a. School furniture and equipment;
 - b. Library literature;
 - c. Textbooks and other learning materials;
 - d. Renovation of high schools buildings;
 - e. Training of high schools teachers.

Categories c. and e. were treated as capital expenditure since the textbooks are used in schools for 4 to 5 years, and the teachers will be trained once in 5 years.

- III. For the assessment of recurrent costs, coefficients of school per capita funding formula were used that were by the joint decree of the Minister of Finance and Minister of Education for 2011.
- IV. Cost data for high school level of General Education were taken from Program Budgeting and Benefit Incidence Analyses.

State Allowance for University Students

- Costs for State Allowance Program represent:
 - I. Necessary technical assistance costs for development of a new framework of higher education financing to be conducted under donor-financing; and;
 - II. Amount of (2011) average unit state allowance (scholarship) for university students (about 700 USD yearly).

State Program for Student Loans

- Costs for State Student Loan Program consist of three types:
 - I. Technical assistance costs for development and piloting of a student loan system;
 - II. Estimated average loan amount per student (about 5,000 USD); and;
 - III. Annual cost of loan repayment by a student, assessed by a student loan scheme cash flow.

Methodology of cost calculations for the proposed programs

High School Program

- The costing of the High School Program was conducted using the following methodology:
 - I. Actual capital costs for 2008–2011 were collected for the above mentioned sources and categories, and totals for all sources and categories were calculated.

- II. Unit costs per cost categories were calculated, using the number of established high schools for the years 2008 –2011 (about 100 schools).
- III. Existing school financing formula introduced by the government in 2010 was used to calculate recurrent costs of 100 high schools established: $Y = A + BN$, using the new high school coefficient (1.15) for per student allocation amount.
- IV. The total and annual recurrent and capital costs were calculated for the whole period of high schools' establishment.
- V. Using PBA and BIA data, recurrent and capital costs for the same period and the number of schools were calculated for the baseline case (i.e. the case of no intervention), the difference of the annual average intervention costs and annual average baseline costs was considered as the additional annual cost associated with the proposed intervention.

State Allowance for University Students

- The costing of the State Allowance Program was conducted using the following methodology:
 - I. The cost of technical assistance for development of a new framework of higher education financing was calculated, including all remuneration and reimbursable costs of one international and two national experts.
 - II. The cost of detailed development of merit- and need-based financing schemes to be financed under the Second EQ&R Project was assessed.
 - III. A few other costs were included in the estimation, such as organization of seminars for discussion around the new financing framework, sector survey for needs assessment, and legal expertise for reviewing the legal enabling environment and proposing appropriate changes to the current legislation.
 - IV. A 5-year period was considered for amortization of the proposed investment and one-fifth of the cost was used as annual cost of the intervention.
 - V. Cost of additional scholarships arising from the introduction of the proposed new merit- and need-based financing scheme was assessed by estimating the potential number of new scholarship recipients (explained in the section on 'Methodology of Effectiveness Estimation') and using average per student scholarship for 2011.

State Program for Student Loans

- The costing of the State Student Loan Program was conducted with the following methodology:
 - I. For technical assistance for the development and piloting of a student loan scheme, the cost of one international expert for 2 months and 3 national experts for 4 years was assessed. These will cover their remuneration and costs related to travel and accommodation for the international consultant, as well as funds for translation of developed materials.

- II. A few other costs were included in the estimation, such as organization of seminars for discussion on the new financing framework, a study tour for 4 specialists, a sector survey for needs assessment, and legal expertise for reviewing the legal environment and proposing appropriate changes to the current legislation.
- III. A 5-year period was considered for amortization of the proposed investment and one-fifth of the cost was used for estimating the annual cost of the intervention.
- IV. The annual cost of loan repayment for a student was considered, that was assessed by a student loan scheme cash flow.
- V. The annual cost estimates were summed up to measure the total annual cost of the State Student Loan Program.

Description of Effectiveness Data

High School Program

- Data for a new distribution of enrollment among quintiles and other parameters of the education sector were obtained through a recent household survey of about 1, 600 households conducted in May 2011 by Advanced Social Technologies NGO. The graph showing the new distribution in higher education is presented in Figure 5 above. The graph showing the distribution in higher grades of secondary schools and high schools is presented in Figure 7 below.
- The following data were used for estimating the effectiveness of the High School Program:
 - i. Data on the university entrance exam results for the year 2010 for all 50 high schools established by the same year in all *marzes* (regions) and the capital city Yerevan, including the number of graduates, the number of applicants to the universities, and the number of entrants to universities that were collected from the schools through a telephone survey.
 - ii. The same categories of data on 2010 university entrance exam results for all schools of Armenia, which were received from the Assessment and Testing Center, the agency responsible for organizing and conducting exams.

Figure 7: Distribution of Enrollment in Higher Grades (10-12) of Secondary and High Schools, 2011

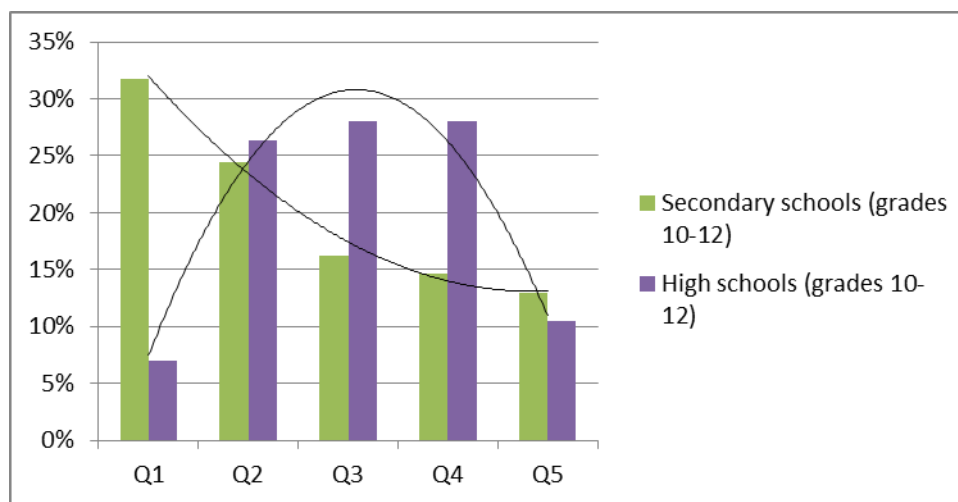
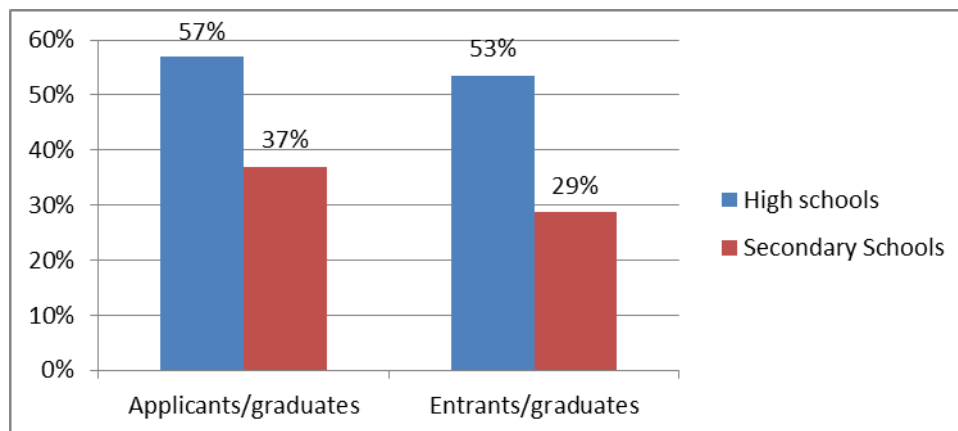


Figure 8 below presents the applicants/graduates and entrants/graduates ratios for graduates from high schools and secondary schools during the 2010 school graduation and university entrance year. It indicates a better pattern for high school vs. ordinary secondary school graduates, both in terms of willingness to enter universities (applications) and success in doing so.

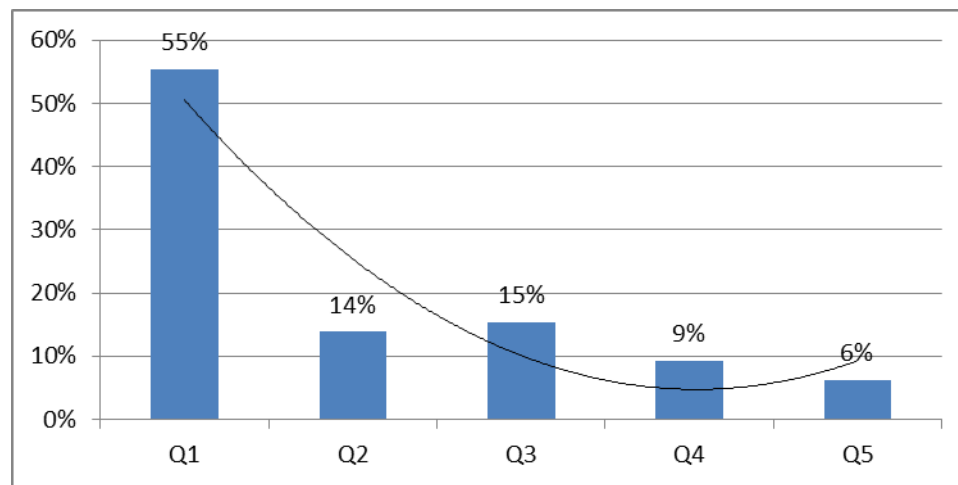
Figure 8: Applicants/Graduates and Entrants/Graduates Ratios during 2010 School Graduation and University Entrance Year



State Allowance for University Students

- The following data were used to estimate the effectiveness of the State Allowance Program:
 - i. Data on new distribution of enrollment in higher education among quintiles obtained through the new household survey conducted by the Advance Social Technologies NGO in May 2011. The graph showing the new distribution in higher education is presented in Figure 6 above.
 - ii. Data on distribution of graduates by quintiles not able to apply to universities because of their inability to pay university fees were obtained through the above survey. This is presented in Figure 9 below.

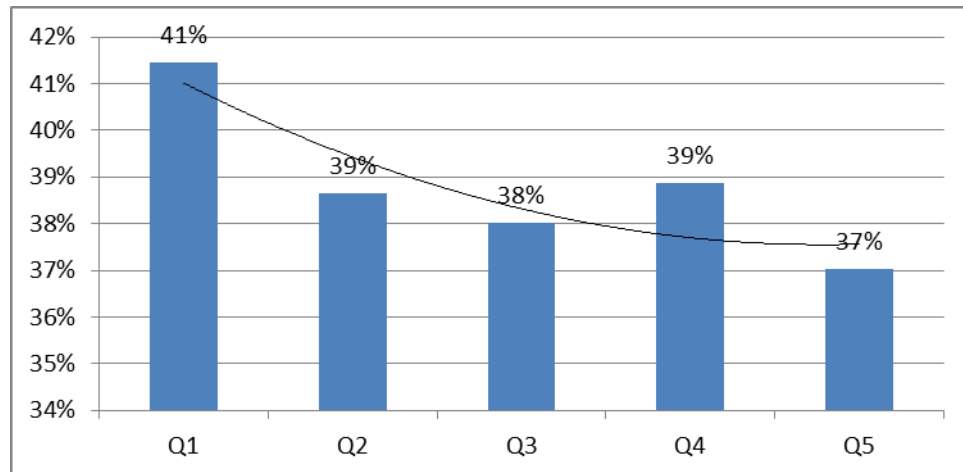
Figure 9. School Graduates who did not Apply to Universities for Financial Reasons



State Program for Student Loans

- The following data were used in estimating the effectiveness of the State Student Loan Program:
 - i. The number of households ready to take student loans was taken from the recent household survey conducted by AST.
 - ii. Modeling/forecasting of the demand: percent changes in the annual numbers of beneficiaries for the subsequent years are based on the assumptions developed by the Student Loan Development Team (WB PIU).

Figure 10. Distribution of Households Willing to take Student Loans

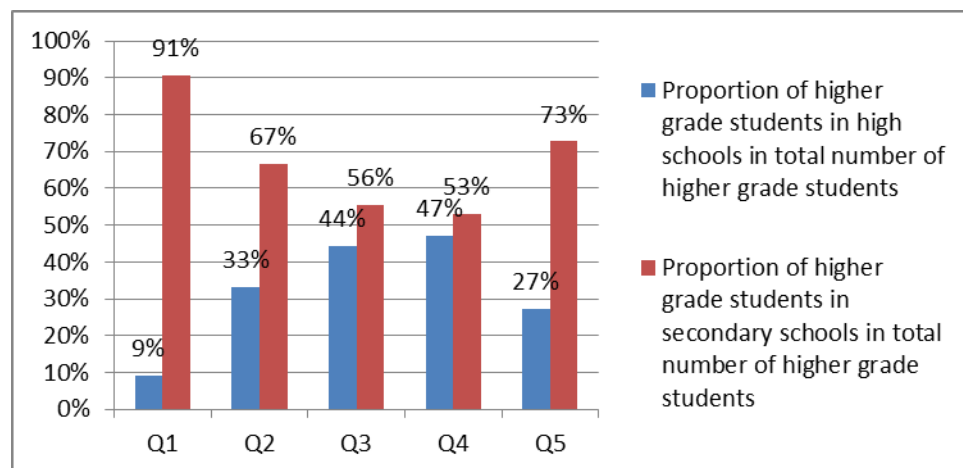


Methodology of effectiveness estimation

High School Program

- The effectiveness assessment for the High School Program was conducted using the following methodology:
 - i. Based on AST household survey results, the distribution of enrollment at different levels of education, including high schools and higher grades of secondary schools, was calculated for all income quintiles (see Figure 7 above and Figure 11 below).

Figure 11. Comparison of Current Proportions of Higher Grade Students in High Schools and in Secondary Schools in the Total Number of Higher Grade Students



- ii. Using the actual number of students in higher grades of new high schools and secondary schools in the 2010/2011 school year, as well as household responses on their plans to send their children in lower secondary grades to high schools, a new hypothetical distribution of 10 to 12 grade students among high schools and secondary schools for all quintiles was calculated to reflect increased interest of households towards new high schools (see Figures 12 and 13 below).

Figure 12. Distribution of Households Willing to Send those Children in Lower Secondary Grades to High Schools

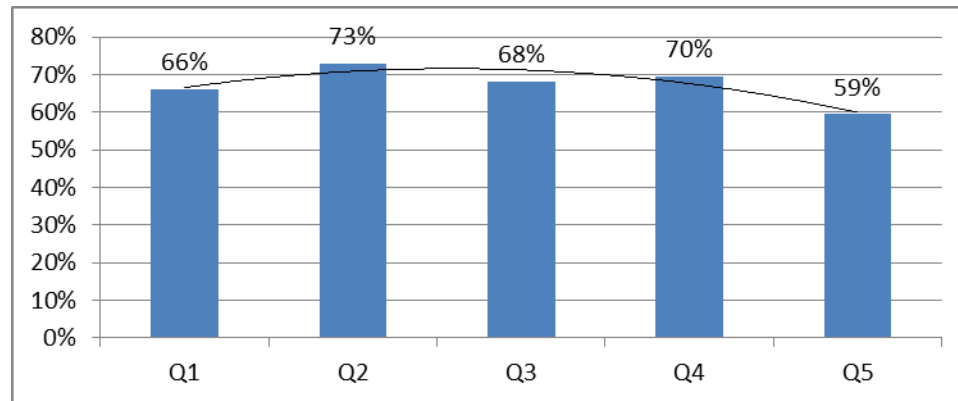
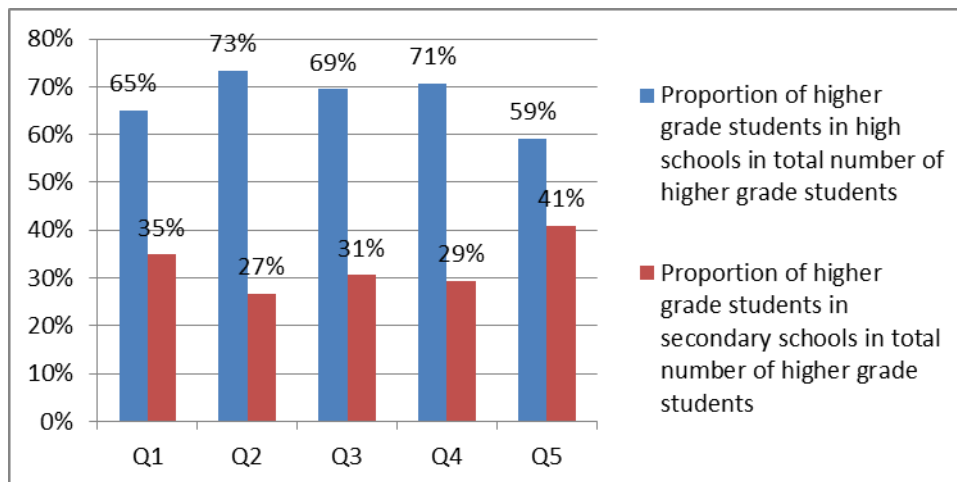


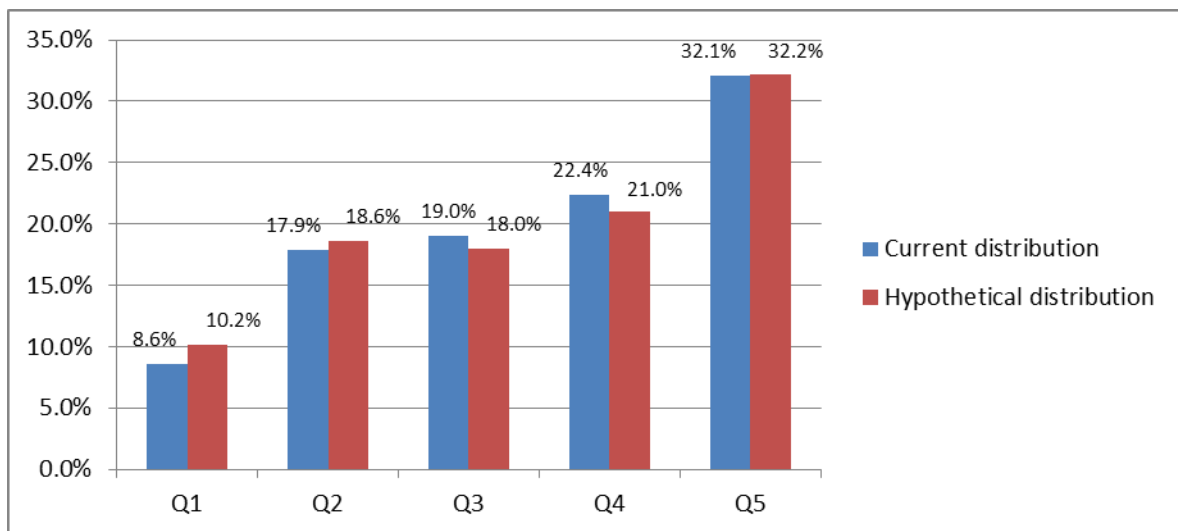
Figure 13. Comparison of Possible Future Proportions of Higher Grade Students in High Schools and in Secondary Schools in the Total Number of Higher Grade Students



- iii. Figure 14 below shows that if the current distribution of enrollment in high schools and secondary schools among quintiles matched the plans of parents to send their children studying in the lower secondary grades to high school, the proportion of high school students should be much higher than it is now. This can be explained by the fact that separately operating high schools have opened only very recently, only time will establish the anticipated distribution.
- iv. The analysis of the rate of entrance for high school and secondary school graduates during university examinations shows that the entrance rate of high school

- graduates (about 54 percent) is almost twice that for secondary school graduates (about 28 percent).
- v. Using the total number of university students for the 2010/2011 school year, and the hypothetical distribution of 10 to 12 grade students among high schools and secondary schools for all quintiles, as well as the percentages of university entrants from the graduates of high schools and secondary schools, new hypothetical numbers of university students were calculated for each quintile that would correspond to the case of increased enrollment in high schools. Figure 14 below presents current and hypothetical distributions of higher education enrollment among quintiles.

Figure 14. Comparison of Current and Hypothetical Distributions of Higher Education Enrollments among Quintiles



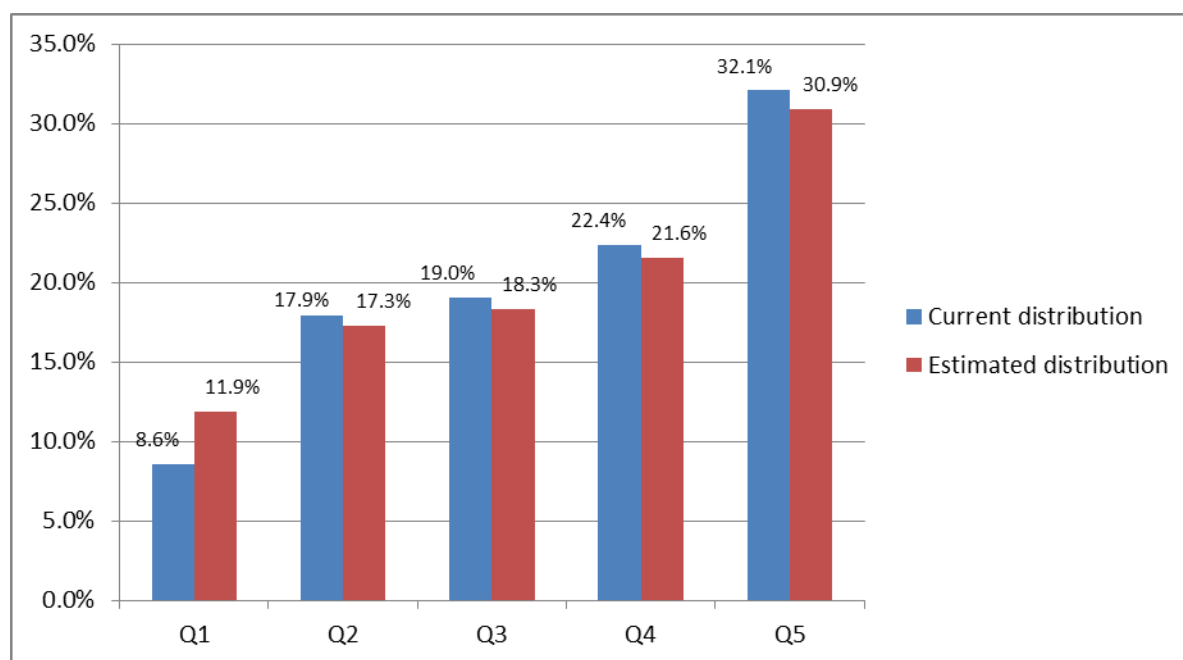
State Allowance for University Students

- The effectiveness assessment for the program of State Allowance to University Students was conducted with the following methodology:
 - i. The number of household survey respondents from the first quintile who did not apply for university study for financial reasons was calculated from the results of the survey conducted by the AST.
 - ii. Assuming that the new need-based financing scheme will supplement the current merit-based scheme and will be designed in a way to effectively identify students only from the first quintile, the number of household survey respondents from the first quintile who did not apply to university because of financial reasons was multiplied by the entrance percentage for secondary school graduates to estimate the number of possible additional students from the first quintile in the event that they have a chance to get state scholarship for university study.

- iii. Then, the new quintile distribution was applied to the total number of current university students to calculate the total number of possible additional students.
- iv. The existing poverty level definition toolkit (family benefit) could be used as a basis for identifying who is in need of the student allowance system and at what level. This would avoid inventing a new scheme for that task, which in turn will decrease both expenditure and time needed for the development and testing of a new scheme.
- v. The proposed system will set a minimum threshold for academic achievement (entrance and annual exam results) and will grant those who pass the threshold some points in the family benefit system to avail of the student allowance.
- vi. As mentioned in point (i) above, this new financing scheme is supposed to supplement the existing merit-based system, which will allow increased state participation in higher education financing, since the current level of financing (about 20 percent of overall higher education financing) is very low compared with the same indicator in OECD and EU countries.

Figure 15 below shows the comparison between current and estimated (based on State Allowance Program assumptions) distributions of higher education enrollment.

Figure 15. Comparison of Current and Estimated Distributions of Higher Education Enrollments among Quintiles

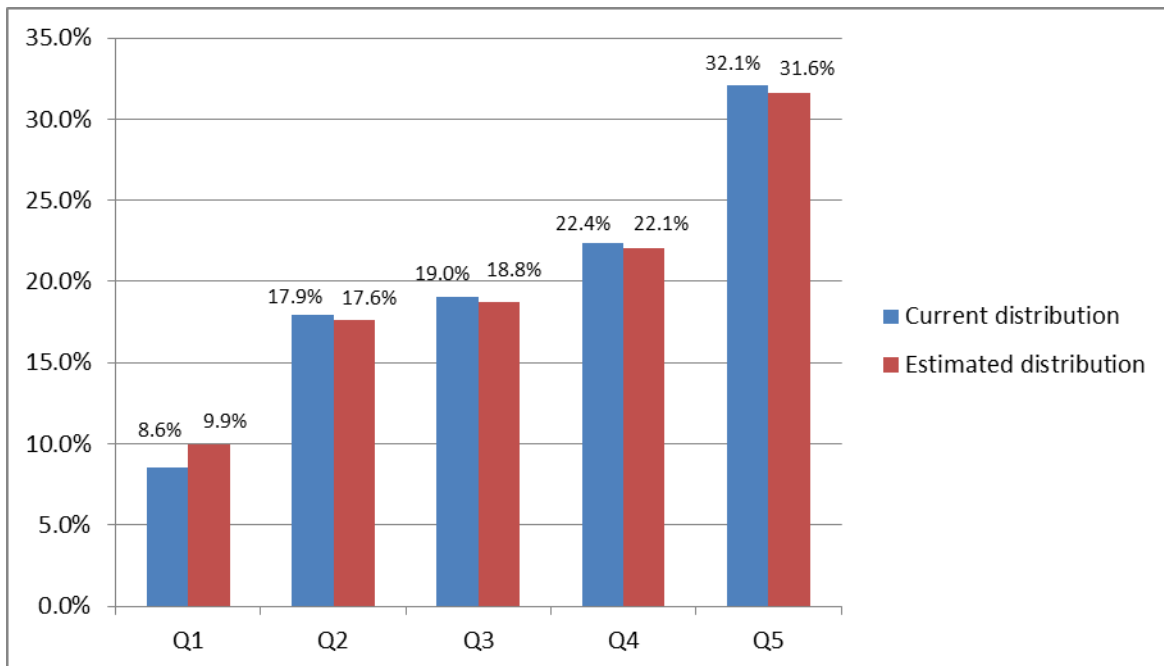


State Program for Student Loans

- The effectiveness assessment for the Student Loan Program was conducted using the following methodology:
 - i. Results of the survey performed by AST enabled the assessment of the percentage of respondents of all quintiles willing to take the student loan as a financing tool for their university education.
 - ii. Assuming that the new student loan scheme will be designed in a way to effectively identify only those students belonging to the first quintile, the number of household survey respondents from the first quintile who did not apply for university education for want of funds was multiplied by the percentage of first-quintile respondents willing to take the student loan, and by the entrance percentage for secondary schools to estimate the number of possible additional students from the first quintile in the case they have a chance to get a student loan from the state for their university study.
 - iii. Then, the new quintile distribution was applied to the total number of current university students to calculate the total number of possible additional students.

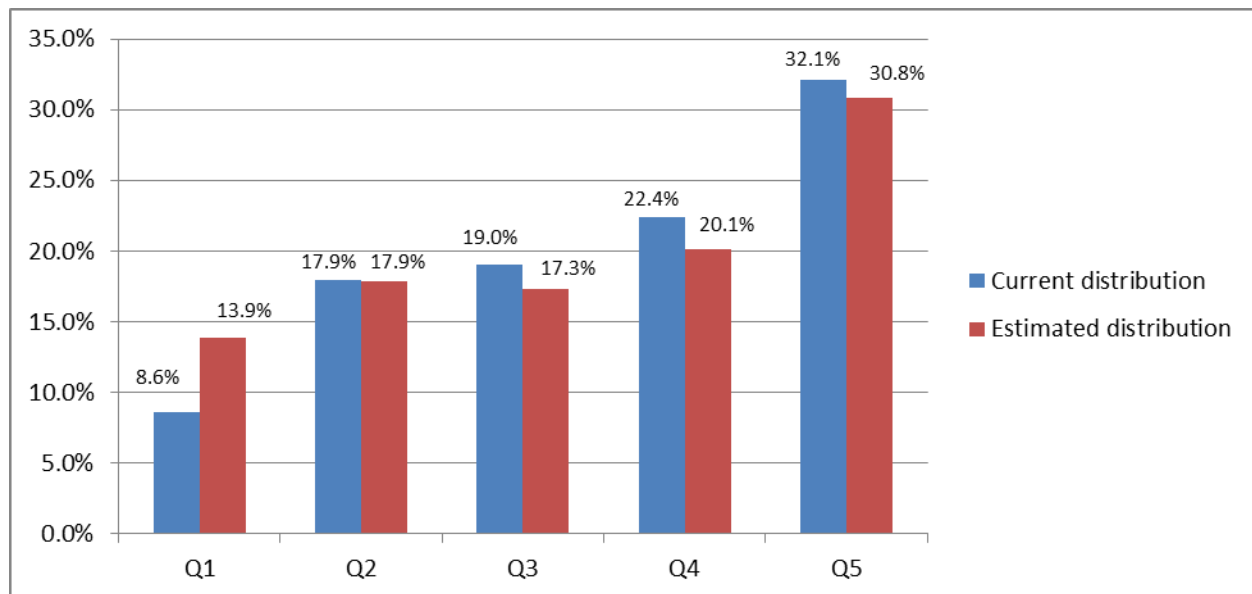
Figure 16 below presents the comparison of current and estimated (based on Student Loan Program assumptions) distributions of higher education enrollment.

Figure 16. Comparison of Current and Estimated Distributions of Higher Education Enrollments among Quintiles



We also made a summation of the possible impact of all three interventions to see the cumulative result; Figure 17 below presents that effect, showing the change in distribution of higher education enrollment in case all three scenarios are implemented together.

Figure 17. Comparison of Current and Estimated Distributions of Higher Education Enrollments among Quintiles



We believe that the combined effect of all three actions will not be less than the sum of individual effects of each action, since both the target groups and the methodologies used in calculation are different. Besides, the three interventions target low-income groups at different stages, which means that, for instance, the positive impact of the first intervention (via high schools) will increase the base of low-income students applying to universities without competing with those already enrolled in the current mode of operation. In fact, the sole impact of the first intervention is not competing with other interventions for the beneficiaries but may also give additional momentum for the success of the other two. This multiplying aspect of the first intervention over the two others is not presented here (to avoid complication), but is used in a basic cumulative way.

Therefore, the high school policy action deals with the potential increase in the number of high school students and measures the potential number of first quintile students using the estimated high school entrance rate (54 percent). The option of need-based scholarships measures the number of additional students who would opt to apply to university if they had a chance of getting government allowances, and the student loan option measures the number of additional students who would take student loans if there were such loans available. And finally, the last two options calculate the potential addition to first-quintile enrollment by using the secondary school entrance rate (28 percent). Thus, all the proposed initiatives can be considered as not competing with each other.

Results

Advanced Social Technologies had conducted a cost-effectiveness analysis in 2011 to estimate the effects and costs of policy interventions that aim at decreasing the imbalance between the poverty quintiles in accessing higher education in Armenia. Table 2 below summarizes the estimated effect of each proposed policy scenario and the costs associated with it.

Table 2. Cost and Effect Comparison of Policy Options

Policy options	Coverage/ Beneficiaries	Total Cost of intervention, thousands of AMD	Savings, thousands of AMD	Net cost of intervention, thousands of AMD	C/B ratio, thousands of AMD
Option 1: Establishment of high school network	4,257.0	7,693,121.3	7,189,934.3	503,187.0	118.2
Option 2: Provision of need-based state allowances	4,142.0	1,294,288.8	0.0	1,294,288.8	312.5
Option 3: Development and introduction of student loan scheme	1,657.0	1,108,442.8	0.0	1,108,442.8	668.9

- The figures under the column Coverage/Beneficiaries represent the potential number of additional university students from the lowest quintile assessed under each policy option. The first option has the largest total cost, but the net cost of the policy option is the lowest as the new system of high schools partially replaces the highest grades of the old system of secondary schools; thus, the marginal net cost to the government will be much lower. As a result, it has the lowest net unit cost. The first two options are to be financed through the state budget, whereas the cost of the third option mainly represents the costs of borrowers to service their student loans. However, the annual amount necessary for the Government to invest in the Student Loan scheme is about 1,839,270.0 thousand AMD.
- Interestingly, the overall assessment of the marginal costs of introducing the new policies as an additional burden on the state budget reveals that all three are quite affordable as they form a small portion in the total education budget. The net costs of the proposed options consist of 0.49 percent, 1.26 percent and 1.08 percent of actual state allocation to the education sector in 2011, or 2.82 percent cumulatively.
- Table 3 below presents annual state allocations to the education sector for the period 2006 to 2012. The figures show that during the specified period, the average annual increase of state allocation was about 5.5 percent. Assuming that this annual rate of increase is possible to attain in the future, it will allow the simultaneous implementation of all three options.

Table 3. Annual State Allocations to Education Sector for the Period 2006 to 2012

	2006 (actual)	2007 (actual)	2008 (actual)	2009 (actual)	2010 (actual)	2011 (actual)	2012 (budgeted)
Total Costs	76,863.6	89,218.4	103,584.5	107,613.3	97,790.1	103,077.6	105,554.3
% change		16.1%	16.1%	3.9%	-9.1%	5.4%	2.4%

Note: In mln AMD

Discussion

- As Figures 14, 15 and 16 show, the High School Program increases enrollment of the first quintile from 8.6 percent to 10 percent, the State Allowance Program increases the same indicator from 8.6 to 11.9 percent, and the Student Loan Program increases the indicator from 8.6 percent to 9.9 percent. On the other hand, according to Figure 17, the combined effect of all three options is an increase in the first quintile's enrollment from 8.6 percent to 13.9 percent. When comparing these results with the provisional policy goal to increase the first quintile's enrollment in higher education at least up to the 15 percent threshold, we see that any one option alone impacts much less than the entire goal set. Even the combined result of all three options is about 1.1 percent lower than the goal. Thus, to be as close to the set goal as possible we suggest that all three policy options be implemented together.
- As described in the section on 'Effectiveness Methodology', the increase in enrollment for both the need-based scholarship and student loan options is estimated using only the secondary school entrance rate. However, if all three scenarios are implemented together, a large segment of new applicants for scholarship and loan options will come from high schools; thus, the entrance rate for this segment will be higher. Hence we can assume that the overall enrollment rate for the first quintile will reach the 15 percent threshold in the mid-term.
- One of the secondary effects of the proposed High School Program is its impact on the increase in number of university students in other quintiles too. This policy option cannot be directly targeted to the first quintile alone; all quintiles will benefit from it. Besides, we could not incorporate the factor of private tuition that still exists among both high school and secondary school graduates, thus leaving it indifferent to our estimates (although there can be some weight in this factor too).
- The main assumption regarding the second and third options that would need to be tested is the one according to which both the State Allowance and the Student Loan Programs can be designed to effectively target only the first quintile. Besides, the Student Loan Program has an assumption of a 95 percent repayment rate which could be actually different from the assumed figure.
- One of the potential challenges to the proposed programs is availability of funds in the state budget necessary to implement all three programs simultaneously. In case the state budget's allocation to the education sector cannot be increased by at least 5.5

percent annually for 2013 and further, the proposed options can be implemented gradually.

Policy Implementation

In order to reach the policy goal set by this analysis, the AST team recommends the complex implementation of all three policy alternatives. It will be better if the Ministry of Education and Science designs proposals for the MTEF/Budget cycle 2012. If the MTEF phase is missed then the option to allocate resources in the 2013 detailed budgeting is still valid.

The recommended policy options need to be drafted by the Ministry of Education and Science and by the Ministry of Finance in the MTEF paper and in annual budget law.

Improvements in legislation

No major changes are needed in legislation in the education sector. Besides, the Government of Armenia has already adopted the strategy of establishing separately operating high schools and the strategy of higher education financing (with AST's earlier findings playing a role in its justification). The latter suggests the introduction and planning of the need-based State Allowance Program in the immediate future. Besides, the state student loan scheme should be designed and adopted by the government.

Risk Management

There are no major risks associated with the recommended policy alternatives. However, the risk of state budget allocation still is: the government may not find the requisite resources to implement the recommended solutions. However, as mentioned above, the total cost of all three options is only 2.8 percent of the overall budget allocation to the education sector. Given the fact that the government pays strict attention to the issues of equity and access in higher education, we believe that an annual allocation of about 2.9 bln AMD is affordable and financially sustainable to begin from the 2013 budget.

Next Steps

Table 4 below presents a set of activities recommended to be performed by the Ministry of Education and Science in promoting the policy changes suggested in this paper. If agreed in principle, the recommended policy can be funded and commence in 2013.

Table 4. Timetable of Activities in Promoting the Policy Recommendation

<i>Steps</i>	<i>Sep-12</i>	<i>Oct-12</i>	<i>Nov-12</i>	<i>Dec-12</i>	<i>Jan-13</i>	<i>Feb-13</i>	<i>Mar-13</i>	<i>Apr-13</i>	<i>May-13</i>	<i>Jun-13</i>
<i>Step 1. Internal ministry discussion of the PS paper presented by AST for decision making</i>										
<i>Step 2 Discussion with Ministry of Finance, with professionals and civil society</i>										
<i>Step 3. Presentation of the policy document to the Government</i>										
<i>Step 4. Discussion by Government, presentation to the Cabinet session and approval</i>										
<i>Step 5. Reflection of the Government approved policy proposal in the draft MTEF 14-16 bid (by MoES)</i>										
<i>Step 6. Development and introduction of mechanisms and a system of accountability and monitoring</i>										
<i>Step 7. Public outreach events, public hearings, press conferences of relevant representatives</i>										