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It Is Expensive to Be Poor: Equity in Financing Education in Turkey (2004–2012)

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After estimating Gini, Concentration and Kakwani indices, and graphing Lorenz and Concentration curves, we find out that education financing in Turkey is regressive. Since the year of 2004 there have been no significant improvements: neither in the income equality levels, nor in the distribution of education financing. The poorest quintiles have the highest shares of education expenditure, and the high school education is the most inequitable. Our results conflict with the claim that Turkey became more accessible to poor and the education policies have decreased the inequality.

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I. Introduction

"Education is the most powerful weapon which you can use to change the world" – said Nelson Mandela. History proves that educated and talented people have had a major impact on our lives. Today people use automobiles, light bulbs, TVs, telephones and internet without thinking of their inventors. Education not only stimulates the innovation, but also helps people overcome poverty and understand the world that they live in. Unfortunately, access to education is limited and not everyone is able to get the education s/he wants. The greater the amount of investment required in education, harder it is for the poor families to find it. Individuals cannot have any returns and gains, if they are unable to invest in the education in the first place; that is where the issue of education equity arises and needs to be addressed.

Equity is defined as fairness, impartiality, and justice and is related to equal opportunity. Equity in education concentrates on the equal access to formal education opportunities and resources. Different policy reforms were implemented around the world to improve the education equity, governments have been main providers of education at a primary and a secondary school levels and in many countries, they have been subsidizing the tertiary education as well. Interestingly, Duman (2008) claims that public expenditure on schooling can harm the poor, if poor have only limited (or no) access to public education yet finance public spending on education via taxes.

If it is possible for public education to favor financially stronger students, private education is not an exception. Private institutions are not affordable for families with lower incomes, children born into poor families do not share equal opportunities with the ones born into high-income families. If governments do not implement effective education policies, education becomes another source of social differentiation and excludes certain groups from taking advantages that it provides for the others.

Psacharopoulous (1986) claims that inefficiencies of educational policies are mainly caused by four reasons: (1) underinvestment in education, (2) misallocation of resources among schooling levels, (3) the inefficient use of resources within individual schools, and (4) inequality in the distribution of educational costs and benefits among various income groups. In addition, introduction of poorly controlled subsidies in the private sector, loose legislation related to the possibility of opening new schools, a deterioration in teacher working conditions and decentralized education policies (that have been developed without the proper mechanisms to offset territorial inequalities) have strong repercussions on the differences in education quality (Bonal, 2007).

All the causes of inefficiencies addressed by Psacharopoulous (1986) can be observed in the Turkish education system. During the last 15 years, Turkey has undergone through many changes. AKP (Justice and Development Party), has initiated many reforms in education, however the government's share in the educational funding has been decreasing. Decrease in the public expenditure on education is accompanied by the increase in the household spending (highest portion of education expenditure is spent on the private

tutoring services). In addition, public expenditure has become more biased towards tertiary education: government spends relatively higher amounts on tertiary education while expenditures on primary and secondary education are significantly below the OECD averages. Number of private preparatory institutions (*Ozel Dershaneler*) has doubled since 2002; number of private schools has sharply increased as well. Increases in the private schooling are likely to lower the levels of intergenerational mobility in education and in income (Turkey has one of the lowest intergenerational educational mobility among the OECD countries, with only 66% of young people having the same level of education as their parents). Following Psacharopoulous' (1986) arguments one can assume that education policies in Turkey are inefficient. However, researches provide different perspectives on the effectiveness of educational policies. Some believe that the educational policies conducted by AKP will lead to a "more inclusive and diverse educational system"[1].

One of the highly-debated reforms conducted by the AK party is the "4+4+4" education act, implementation of which costed 50% of the government's education budget in 2012. The act extends compulsory education from 8 to 12 years, but divides it into three four year stages. It requires children as young as 11 to choose between academic-track and vocation-track schooling. Critics state that the fifth grade is too early for children to be "steered away from a basic curriculum and be asked to make vocational choices about how to spend the

[1] Grossman, H. (2016) "4+4+4: Controversial Education Reform in Turkey Sparks Debate" http://www.borgenmagazine.com/444-education-reform-in-turkey/

rest of their life"[2]. NGOs and women rights groups claim that this reform would "rekindle child labor, increase child brides and condemn girls to illiteracy"[3]. Experts also state that the new system would hurt the less privileged: children from poor families or who only know Kurdish language, when they enter the first grade, will be hurt when they compete for middle school. They will be unable to overcome their handicap by the end of the fourth grade and will not be able to perform well on the competitive examinations required for entering middle schools.

The other two well-known projects conducted by AK party are the "Conditional Cash Transfers" and the "FATIH Project". The Conditional Cash Transfers (CCTs) program was launched with the assistance of the World Bank in 2001. On the one hand, the program aimed to prevent poor households from becoming poorer, and on the other hand, it intended to improve their children's future productivity and incomes. The CCT project is dealing with households' economic problems since it provides financial resources, however, there are also institutional and socio-cultural reasons why households refrain from sending their children, and particularly their girls, to school. Among these, supply-side factors such as inadequate number of schools or transportation are very crucial (Pop, 2012).

[2] Finkel A. (2012) "What's 4+4+4?" https://latitude.blogs.nytimes.com/2012/03/23/turkeys-education-reform-bill-is-about-playing-politics-with-pedagogy/?_r=0

[3] Sevinc K. (2012) "4+4+4 formula in Turkish educational system would increase the number of child marriages and instances of child labor in Turkey" https://kadersevinc.blogactiv.eu/2012/03/05/444-change-in-turkish-educational-system-would-increase-the-number-of-child-marriages-and-instances-of-child-labor-in-turkey/

The “FATIH Project” (which stands for *Fırsatları Artırma ve Teknolojiyi İyileştirme Hareketi*, or 'Movement to Increase Opportunities and Technology') was launched in 2011 to enhance the technological infrastructure of classrooms and to provide all students with tablet computers. The project has some issues faced not only in Turkey, but in other countries where similar “1-to-1 computing” programs have been implemented. The mere presence of technology might not improve school-level outcomes and there is a danger that, if teachers are not continually supported (not only via 'one-off trainings') in practical, useful, contextually relevant ways, the "tablets risk becoming little more than digital desktops" (Trucano, 2013)[4].

In our study, we are analyzing the burden of the out-of-pocket expenditures on education by levels of education, and across income groups. Specifically, we are interested in evaluating the claims regarding the improvements in education equity. All the above-mentioned changes and all the divergences in opinions on whether or not those policies contribute to the improvement of educational outcomes make Turkey a center of our research. The key question addressed by our research is whether the AKP education policies lead to a more “inclusive and diverse system” or they exacerbate the inequality and further disadvantage the poor. We inquire this aspect from the financial perspective (see section II for more details), the purpose of financing is to ensure equal access to education and provide equal opportunities. Finding out whether or not education financing

[4] http://blogs.worldbank.org/edutech/observing-turkeys-ambitious-fatih-initiative-provide-all-students-tablets-and-connect-all-classrooms

in Turkey presents a bias against the poor and a bias in favor of higher education will help us evaluate the AKP policies and overall equity in the Turkish education system.

Section II of our paper presents the Education and Its Financing, Section III describes the Turkish Education System, Section IV provides the Data and Methodology, and Section V is composed of the Conclusion.

II. Education and Its Financing

Researchers often use the externality argument to emphasize benefits of education for the society. School curricula provide the sense of civic duty and spread social mores, ideologies and languages; literacy and numeracy facilitate social and economic transactions. These activities do not benefit one individual as much as they benefit society at large.

In the human capital model, expenditures on education have two components, investment and consumption. Investment in education is assumed to have positive effects on human skills and worker productivity, it provides higher income and the acquisition of status for an individual, and economic growth, technological progress and collective well-being for the society. Consumption side represents arguments in the utility functions of those obtaining education. Given those claims, it is evident that on an individual basis there is a relationship between an expenditure in favor of a child from a poor household and the future earning potential, which will lift that child above the poverty line. However, the crucial observation is that the greater the amount of investment required in education, harder it is for the poor families to find it. Families cannot have any returns and gains, if they cannot invest in the education in the first place.

Equity in education concentrates on the equal access to formal education opportunities and resources. Equality of opportunity is considered to maximize the total social good and increase social gains. Education is a determinant of opportunity of outcomes and economic growth, therefore lack of education is often viewed as a cause of inequality and underdevelopment. These arguments are supported by the Mincerian earning function, which underlines that "always and everywhere, more education is on average associated with higher income" (Van Der Berg, 2013[5]). In order to get access to education and complete higher levels of schooling, individuals need to cover all the associated costs of attending educational institutions. Tuition, transportation costs, books and other supplementary materials can be quite expensive. Household incomes have direct effect on affordability of education, therefore in our research we concentrate on calculating the out-of-pocket expenditures of the different income quintiles. We agree that children of high- and low-income families are born with similar abilities but different opportunities, and that those opportunities are highly impacted by household expenditures. Higher the out-of-pocket expenditure required for affording educational services, lower the opportunities of low-income students. Calculation of out-of-pocket expenditures helps us evaluate the progressivity of education system discussed in the following section under the Education Equity title.

[5] http://blogs.worldbank.org/futuredevelopment/social-mobility-and-education

2.1 Education Equity

Equity in education has two components: fairness and inclusion (Simon et. al. 2007). Fairness aspect makes sure that personal and social aspects (gender, socio-economic status, ethnic origin) do not restrict anyone from achieving their educational potential. Inclusion factor ensures a basic standard of education for all.

Regarding the sources of the inequity Benadusi (2001) presents four main sociological approaches. These approaches are: the functionalist approach, the social or cultural reproduction theory, the cultural relativist and pluralist approaches, and the methodological individualism approach. Based on Durkheim's and Parsons' research tradition, functionalist approach considers "aspirations factors" (such as social class, gender, ethnic group) and "achievement factors" ("personal natural" endowment and will of the individual to use and develop it) as determinants of educational inequalities. On the other hand, social or cultural reproduction theory explains the educational inequalities entirely by social inequalities. The cultural relativist and pluralist approach emphasizes the role of school and considers school as an active producer or reproducer of inequalities. And the last approach the methodological individualism approach, even though recognizes that choices made by individuals are constrained by cultural and social aspects, it still places individuals and individuals' choices as the core determinant of the inequalities.

Researches not only identify different sources of inequality, but also distinguish between different types of equity: horizontal equity and vertical equity. Main principle of the horizontal equity is the "equal treatment of equals". Individuals with the same amount of

wealth, or similar levels of income, should face the same tax rate. On the other hand, vertical equity is based on the idea that richer groups should pay higher taxes, therefore they should be contributing proportional to their income. Taxes can be classified into three groups: progressive, proportional, or regressive. A progressive tax increases as income increases (larger absolute amount and a larger percentage of income); a regressive tax is an example of a tax rate decreasing as income increases; and a proportional tax keeps the tax rate at a same level regardless of income. Our research is not concerned with the taxation system; however, we will use the similar evaluation approach to measure progressiveness of the education expenditures of different income groups.

The progressiveness of the education system plays crucial role in the social mobility aspect of individuals. “A college degree can be a ticket out of poverty”, however, it is children with richer parents who generally perform better, get better quality education, and are more likely to progress to higher levels of education. If an education system is inequitable (regressive), it pressures the poor to incur higher financial costs (by increasing the shares of education expenses in their out-of-pocket expenditures).

The case of Turkey that we discuss in our paper is already worrisome, as countries with high income inequality have low social mobility. Ineffective Turkish education policies may even further lower the social mobility levels and contribute to the intergenerational persistence (the hierarchy of families is maintained over time). The acquisition of human capital is a key determinant of intergenerational mobility. Thus, education and its financing is at the core of our discussion. Evaluation of equitability of the system is specifically

important for the lower income quintiles. If education policies are biased against the poor (in our case result in higher shares of education expenditures), the acquisition of human capital through the enrollment in different levels of schooling becomes unaffordable.

As education strongly affects intergenerational mobility, predictably it also impacts overall inequality levels. Even though our research does not measure the effects of the Turkish education policies on inequality levels, we still present some of our literature findings regarding the relationship between public education and income inequality.

2.2. Education Policies and Inequality

The lack of education contributes to the perpetuation of inequality, and if social and income inequalities have negative effects on economic and political environments, then countries need effective educational policies for attaining equal income distribution. Different policy reforms were implemented around the world to improve the education equity, teacher trainings, encouraging progressive teaching methods, increased physical resources and etc (Othman and Muijis, 2012). Governments have been main providers of education at a primary and secondary school levels and in many countries, they have been subsidizing the tertiary education. Sylwester (2000) presents that public education can actually lower the level of income inequality provided that agents have resources to forgo income and attend school. However, "if agents are too poor, then promoting public education can actually cause the distribution of income to become more skewed since the poor are taxed for revenue but do not enjoy the benefits of the public education system" (Sylwester, 2000:43). Duman (2008:371) provides a similar argument, claiming that

"public expenditure on schooling harms the poor most if they have only limited (or no) access to public education yet finance public spending on education via taxes".

Most of the researchers agree that investments in public education are beneficial for an economic growth. Using Gini coefficients and Lorenz curves Sylwester (2002) shows that countries with higher expenditures on public education as a percentage of GDP have lower income inequality in following years, however, effects are slow to be realized. In the less developed countries income inequality lessens slower than in the OECD countries. Sylwester (1999) explains that in the short run education expenditures are not associated with economic growth or perhaps they even lower growth.

Davies et al. (2003) find that without fresh shocks to income in each generation (source of persistent inequality) (i) inequality disappears in the long-run under public education and under private education as well (under a suitable concavity condition) (ii) inequality falls more quickly under public than under private education, and (iii) provided initial inequality is low, the long-run growth rate is higher under private than under public education. With fresh shocks to income in each generation, Benabou (1996) shows that inequality has "a lower steady-state value under public than under private education. Further, public education produces faster rather than slower long-run growth" (Davies et al. 2003:1). In a long-run public education results in economic growth, but in the short run it might not be the source of the positive growth. Authors agree that public education decreases inequality, therefore countries should invest in education, however, policy makers should carefully examine educational policies and concentrate on long term

benefits rather than focus on economic gains in the short run. From these arguments, we derive:

Hypothesis 1: Public spending on education decreases inequality levels.

Table 1: Education Expenditure, Primary to Tertiary, % of GDP (2013)[6]

Education Expenditure	Public	Private
Australia	4.7	5.6
Belgium	5.8	5.8
Czech Republic	3.4	4.0
France	4.8	5.3
Germany	4.2	4.3
Norway	7.3	6.3
OECD Average	**4.8**	**5.2**
Poland	4.4	4.8
Turkey	**4.6**	**5.0**
United Kingdom	5.5	6.7
United States	4.6	6.2

Table 1 presents that countries spend around 5 % of their GDP on education. However, what matters for inequality is not only the level of public spending on education, but also how it is spent. Finding the level where social returns are the highest seems to be one of the key challenges faced by policy makers. Birdsall (1996) states clearly that the level may vary across countries. However, based on the higher estimated social returns at the primary (and secondary) levels throughout the developing countries, their article has been interpreted to discourage public spending on higher education. Restuccia and Urrutia (2004) also argue that public spending on early education is more effective than public spending on tertiary education in reducing intergenerational persistence on income inequality. If children from poor families do not receive adequate levels of early education,

[6] OECD Statistics https://data.oecd.org/eduresource/private-spending-on-education.htm#indicator-chart

they are not able to build the necessary human capital to attend colleges. As a result, even if the college education is provided for free, as long as parental background determines who can go to college, free college education is likely to be ineffective in reducing intergenerational persistence of income inequality (Filiztekin, 2006).

Birdsall (1996) explains these findings by contrasting positive externalities arising from primary versus higher education. Access to lower education results in lower fertility and better health and nutrition, more politically aware citizens, who are more likely to contribute to political and social cohesion. Access to higher education does not provide as many direct positive externalities. People can capture the full benefits of additional education in the form of higher wages and "personal nonpecuniary returns" at lower levels than at higher levels of education. Returns are higher at lower levels of schooling, and as the public expenditure on primary education mobilizes additional private resources, it further increases resource allocation to education. Most importantly investments in primary education improve education equity, as additional enrollments come from lower income groups rather than from the average students at higher and secondary levels (Psacharopolous, 1986).

These arguments do not discourage investment in tertiary education, they underline that in regard to expenditure, most of the funds should be allocated to lower levels of education. There are different reasons why governments should keep subsidizing tertiary education. If we concentrate on the Turkish case, Caner and Okten (2012) provide two reasons supporting the government subsidies for the higher education:

1) Borrowing against future human capital is very limited and students from low-income families have difficulty affording college, even if their private returns to education are greater than their costs.

2) Social returns to higher education are likely to be higher than private returns and hence in a free market the level of higher education is likely to be less than the socially optimal amount.

Unlike the findings in other countries, in Turkey, students from higher income and more educated families are more likely to enter public universities that receive larger subsidies from the government. Given these reasons, Caner and Okten (2012) claim that the government should not subsidize the higher education of high income families who even in the absence of subsidies are able to afford it. The subsidies should be justified and should not result in an income transfer from the poor to the rich. From these discussions, we derive additional hypotheses:

Hypothesis 2: Investments in lower levels of schooling are more effective in decreasing income inequality, and

Hypothesis 3: Investments in higher education need to be justified, so that they do not exacerbate the inequality levels.

Table 2: Public Spending on Education per Student in US Dollars (2013)

Education Expenditure	Primary	Secondary	Tertiary
Australia	8,289	10,932	18,336
Belgium	9,956	12,763	15,910
Czech Republic	4,730	7,860	10,432
France	7,200	11,482	16,194
Germany	8,103	11,106	16,894
Norway	13,273	15,282	20,378
OECD Average	**8,477**	**9,811**	**N/A**
Poland	6,919	6,505	8,929
Turkey	**2,893**	**3,589**	**10,637**
United Kingdom	10,669	12,200	25,743
United States	10,958	12,739	27,923

The provided literature discussion gives us opportunity to analyze education equity in Turkey with two different approaches. First method is a statistical approach. Following O'Donnel's et al. (2008) guidelines we will measure Kakwani indices and graphically illustrate education financing aspects via Lorenz and Concentration curves. Second approach is based on our theoretical findings. Following section will provide discussion on the Turkish education system. Analyzing the Justice and Development Party projects with regards to our hypotheses will help us derive conclusions on the progressivity of the education system.

Our goal is to show whether people benefit equally from the implemented education changes. By observing the trends in the out-of-pocket expenditures on education we will be able to determine equitability of the system.

III. The Turkish Education System

In Turkey, the Ministry of National Education (MoNE) is the central institution regulating primary and secondary education. It includes structures and policies that influence pre-primary and higher education as well as non-formal education. The MoNE has provincial organizations in 81 cities and 924 districts.

The general goals of the Turkish education system are:

1) To raise all individuals as citizens who are committed to the principles and reforms of Ataturk and the nationalism of Ataturk as expressed in the Constitution, who adopt, protect and promote the national, moral, human, spiritual and cultural values of the Turkish Nation, who love and always seek to exalt their families, country and nation, who know their duties and responsibilities towards the Republic of Turkey which is a democratic, secular and social state governed by the rule of law, founded on human rights and the tenets laid down in the preamble to the constitution and who have internalized these in their behaviors;

2) To raise them as constructive, creative and productive persons who are physically, mentally, morally, spiritually and emotionally balanced, have a sound personality and character, with the ability to think freely and scientifically and have a broad worldview,

that are respectful for human rights, value personality and enterprise and feel responsibility towards society;

3) To prepare them for life by developing their interests, talents and capabilities, providing them with the necessary knowledge, skills and attitudes and the habit of working with others and ensure that they acquire a profession which shall make them happy and contribute to the happiness of society;

4) In this way, to increase the welfare and happiness of Turkish citizens and Turkish society, and support and accelerate economic, social and cultural development within national unity and cohesion, on the other hand, make the Turkish Nation a constructive, creative and distinguished partner of contemporary civilization (MoNE, 2005).

Pre-primary education is optional for children between 36 to 72 months old. Pre-primary attendance has been increasing, but is still very low compared to OECD countries, with 6% of children attending in 1996 and 27.6% attending in 2013 (OECD average 83%).

Primary education is free in public schools and compulsory for all boys and girls, usually children start primary education at the age of six or seven and continue for eight years. Turkey's primary education completion rate is high, equaling 99.8% as of 2012. After the new legislation on primary and secondary education passed in 2012, eight years of primary education were split into two parts, four years of primary education and four years of first level primary education. The first level plays a role of middle school, in which students are

able to choose whether they want to study at a general education middle school or a religious middle school, known as Imam Hatip schools.

Turkish secondary education is composed of four mandatory years of education. Secondary public schools are free of charge. Students are given an option to attend general higher-education preparatory or vocational-technical schools.

At the age of 18, after the successful completion of secondary education, students may enter higher education institutions. Higher Education Council administrates all higher education institutions, available in both government-supported and private institutions. Higher education is provided by universities, high technology instituters, higher vocational schools and other off-university higher education institutions (higher police and military schools and academies, advanced technology institutes and conservatories). As of 2014, there are 190 higher education institutions in Turkey (104 state universities, 72 non-profit foundation universities, 8 independent post-secondary vocational school, and 6 other higher education institutions).

Non-formal education in Turkey includes adult education for basic literacy, the completion of an interrupted earlier education, healthy lifestyle choices, various kinds of professional development, the improvement of scientific and technological skills, and the encouragement of “national cultural values”.

As of 2015, Turkey has a population of 78.7 million, with 16.4 million students at the primary and secondary education levels and more than 900 thousand teachers. Extension

of compulsory education from 5 to 8 years in 1997 and to 12 years in 2012, has positively impacted average years of schooling, however the number is still low, equaling only to 8.1 years (2015) and falling behind the average of developed countries (11.9 years in 2010). When primary, secondary and tertiary educations are combined, the gross enrollment rate in Turkey is 95.8% (2013). The female ratio is 93% and the male ratio is 98%.

Our research focuses on analyzing effects of education policies on education financing. As it was mentioned earlier household spending on education in Turkey has been increasing. The share of education spending in households' total expenditures rose from 2% in 2003 to 2.4% in 2012. In 2011, 13% of all education expenditures were made by households. A higher level of inequality along the income distribution is vivid when one considers the magnitude of education expenditures rather than its share. The highest income group has six times higher income, but ten times higher expenditure on education

It is impossible to evaluate current conditions of the Turkish education system without looking back at its historical development. Although recognizing that "Turkey cannot be understood without reference to its Ottoman past" (Zurcher, 1994), we provide brief summaries of the periods only after the establishment of the Turkish Republic.

3.1 Economic and Political Development of the Turkish Education System

Single Party Period (1923-1946)

The establishment of the Turkish Republic in 1923 was not only a change of the political regime, but also a cultural transformation, including many educational reforms. The

Turkish government introduced the new Latin alphabet and modern educational institutions to improve the literacy rate. Number of schools and teachers increased rapidly. During the first decade of the republic, number of schools increased by 35%, 15%, 148%, and 88% in primary, secondary, high schools and higher educational institutions, respectively. During the same period number of enrollments increased by 43% in primary schools, 359% in secondary schools, 360% in high schools, and 44% in higher educational institutions. The rate of literacy increased from 11% in 1927, to 20.4% in 1935.

During the single party period the leading function of education was political and cultural socialization. It was a tool facilitating the adoption of new social, political and cultural values, and supporting the establishment of the newly created nation-state with the new institutional structure. In terms of economic progress investment in physical, human and financial resources was crucial for the development of the Turkey. The National Schools Law passed in 1929, required all citizens between the age of fifteen to forty-five to attend reading rooms set up in every village. Later in 1933, Resit Galip (Minister of Education) formed the Village Affairs Commission, purpose of which was to create new type of village teachers, who would understand villagers' life and provide practical trainings to solve their problems. Mobile Village Women's Classes and Village Men's Training Classes were introduced in 1938 and 1939 respectively, those training programs concentrated on making agricultural and industrial production more productive.

The key reform implemented by the Turkish Republic during this period was the abolishment of duality between secular and religious education. In 1923 MoNE declared

that schools had to be loyal to the Republican principles. In 1924, the Law on Unification of Education was passed and encouraged establishment of secular education institutions based on Western European model, specifically French education system.

Multi-Party Period (1946-1962)

"The social changes of early post-war period were of a kind which favored conservative rather than innovative policies in education and which did not challenge in any way the connection between education and elite recruitment" (Williamson, 1987:103). Even though there were improvements in literacy rates from 30% in 1950 and to 40% in 1955, disparities between urban and rural education were huge. Low quality of education was limiting the progress, in 1956, there were only 7,586 engineers and 910 architects in a population of 25 million people (Robinson, 1964:155).

Until the year of 1950 the number of private schools were limited, and were mostly composed of special foreign schools. However, the number of private schools gradually started to increase. New types of secondary schools "Educational Colleges" (Maarif Kolejleri) were established, classification of such schools as 'private state secondary schools' was an important factor in the provision of public education and served as a signal of future establishment of Anatolian Secondary Schools (*Anadolu Liseleri* refers to public high schools in Turkey, that admit students according to nationwide examination).

Domestic and Foreign Instability (1963-1979)

Kazamias (1966) compares the Turkish education system of the 1963-1979 to the 'minaret', the proportion of the population enrolled in school at different levels was sharply declining at the higher levels of the system. In 1945-6, only 12% of primary school graduates started a secondary school. In 1971-2 the rate increased, 42.7% of primary graduates continued their education at secondary school (29.5% of girls and 51.3% boys).

The main criticism of the system during the 70s was based on the inadequacy of lise (secondary school) graduates to the demands of university work, the lack of teacher-student contact, and the reliance on formal teaching methods and limited text books.

During this period the number of private institutions continued to increase. There were only 57 primary and 36 secondary private schools in 1932. In 1965 numbers increased to 164 and 76 respectively. The Law on Institutions of Private Education passed in 1965, covered private institutions at every level of education. Its Article 2 highlights that these institutions cannot be opened for the purpose of making a profit, 'the purpose of making a profit can only be for the implementation of necessary investment and to provide services, based on the principles of enhancing the quality and further development of Turkish National Education'.

Private and public investments in higher education were limited. In 1971 there were only 9 public universities financed by the Ministry of Education (Williamson, 1987). However, Turkish higher education received aid from international community. France

helped the University of Ankara to complete a hydraulic laboratory, the British council offered language courses, and the Middle East Technical University received funds from USAID, CENTRO, the Ford Foundation and OECD.

Neoliberal Developments (1980-2002)

The neoliberal economic policies adopted after the military coup in 1980, resulted in the wider income gaps and lower social services. The effect on education was the creation of a dual system, in which private schools would serve the rich and provide the high-quality education, whereas the lower- and middle-income groups would be at public schools with diminishing resources.

The structural adjustment policies imposed by the IMF and adopted by the Turkish government on 24 January 1980, encouraged reduction of government spending and privatization of the economy and public services. Kemalist approach (founding ideology of Republic of Turkey implemented by Mustafa Kemal Ataturk) to education as a tool for development and modernization was forgotten and neoliberal philosophy was internalized by government officials. As a result, financial allocations to education decreased. The reduction in educational expenditure was accompanied by a rapid rise in population, from 20.9 million in 1950, to 44.7 million in 1980 and to 71.2 million in 2000.

Privatization was not limited only to primary and secondary levels of education. After 1980s neoliberal policies, private universities appeared as ‘foundation universities’. The

word foundation did not sound as radical as the private and was not in conflict with the public higher education system.

Even though enrolment rates were improving, the transition from primary to secondary education was still problematic, in 1994-5 only 68.7% had access to the first levels of secondary education. The rate of schooling for the overall secondary education was only 46.5% (1994).

In 1997, compulsory education increased from 5 to 8 years.

> "The government abolished the traditional diploma that had been awarded at the end of the fifth grade, replacing it with a diploma for successful completion of the eighth grade. This was a significant move since many students and their families viewed gaining primary education diplomas as critical to joining the workforce and therefore, were now pressured to complete eight years of education to gain the traditional diploma (Dulger, 2004:1-2). "

The Justice and Development Party Government (2003-2012)

Even though many reforms were conducted since the year of 2002, mostly the changes were made for gaining political advantage, as a result the educational system to large extent has stayed the same (Aksit, 2007). The goal of the government was to minimize public support and foster commercialization and marketization through a variety of resources for educational funding (Akkaymak, pg. 89).

During 2002-2011 around 70% of education expenditures were spent on the salaries of around 600 thousand personnel (mainly teachers). In addition, the government's share in the educational funding has decreased gradually, while households' share has been increasing. The shares of total joint expenditures for the MoNE and universities, including

revolving funds in GDP were as follows: 4.33% (2002), 4.03% (2005), 4.53% (2007), and 4.03% (2009). Shares of MoNE in GDP were 3.05% (2007) and 2.72% (2009). Allowances to universities (despite the increasing number of students) have decreased from 1.04% (2002) to 0.79% (2009) (Akkaymak, 2010:89).

Decreases in the public expenditure were accompanied by the increases in the household spending on education. The highest portions of education expenditures went to the private tutoring services (which prepare students for the entrance examinations for private secondary, Anatolian secondary schools and all the universities). Number of these private institutions increased from 2,122 in 2002, to 4,099 in 2011. Number of teachers in these institutions increased from around 20 thousand to 50 thousand, and the number of students doubled, from 606 thousand to 1,234 thousand.

The increase in private preparatory institutions was accompanied with the increase in the number of private schools. From 642 primary and 487 secondary schools in 2001, to 728 primary level and 650 secondary level schools in 2005, serving 180,090 students and 76,670 students at primary and secondary levels respectively.

Aksit (2016) provides two reasons to why enrollments in private schools have been increasing. Firstly, public schools are believed to provide insufficient education. with the half of the population under the age 25, public schools are overcrowded. The decrease in the quality of service provided by public schools leads well-to-do parents to seek alternatives in the private education sector, what further deteriorates the public schools. Average size in private school classrooms is 20-25 students, whereas in public schools it

equals to 60-70 students. In some poor neighborhoods classes have 80-90 students. Secondly, higher income groups need private schools to keep their socioeconomic status and material advantages (pg.25). The cost of private schools ranges from $3,000 to $13,000 depending on the school reputation. Private schools also receive subsidies in the form of exemption from income and corporate taxes, credits and direct provision of public funds.

3.2. Private and Public Spending on Education

> "In Turkey, the education premium is quite high and households with greater levels of schooling manage to earn significantly higher incomes. This in turn contributes to their willingness to invest in their children's education. Thus, intergenerational inequalities will be reproduced if educational opportunities are not expanded and made available to the poor. Moreover, there are still considerable private and social returns on primary and secondary schools; hence, funding these types of education will be beneficial both individually and socially" (Duman, 2008:383).

Acar et al. (2016) find that as of 2012, 3% of an average Turkish household income was spent on education. A higher level of inequality along the income distribution is vivid when one considers the magnitude of education expenditures rather than its share. The highest income group has six times higher income, but ten times higher expenditure on education. Between 2003 and 2007, "The average real total household expenditure significantly rose by around 50% for all quartiles, whereas the rise is limited to approximately 20% for the period 2007-2012" (Acar et al. 2016:12).

Although public primary education is 'free' in Turkey, parents are asked to pay registration fees and make 'voluntary' donations to schools under the name of 'parental contributions' (Simsek 2006). Parental contributions amount to substantial sums; for instance, in 2003, such parental contributions in primary and secondary education were

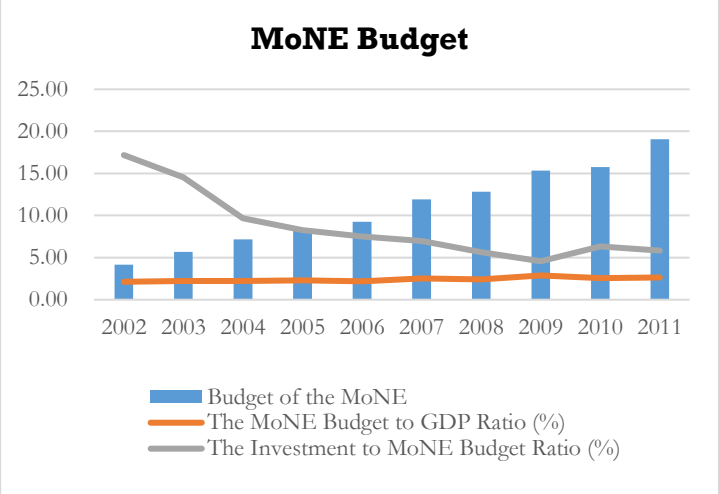
twice more compared to the government education budget (Keskin and Demirci 2003). The AKP government aims to increase the share of private schools in the primary education sector, the government proposed a number of measures to promote the establishment of private schools with the help of public funds (Altinyelken, 2015).

Acar et al. (2016) argue that both public and private spending on education has been rising. Share of education expenditures in total government spending increased from 6.5% in 2002 to 9% in 2012. Most of the budget was used for building schools and classrooms. Since 2002 number of new classrooms increased by more than 230,000.

> "The cost of the most recent education reform act called 4+4+4 is calculated as more than 50% of the central government's education budget in 2012. However, education expenditures of the central government per student both in primary and secondary level are significantly lower than the OECD average" (Acar et al. 2016:7).

Because of the limited public spending on primary and secondary education and growing private spending Duman (2008) argues that spread between socio-economic groups is not likely to decrease significantly. He states that Turkish government is not

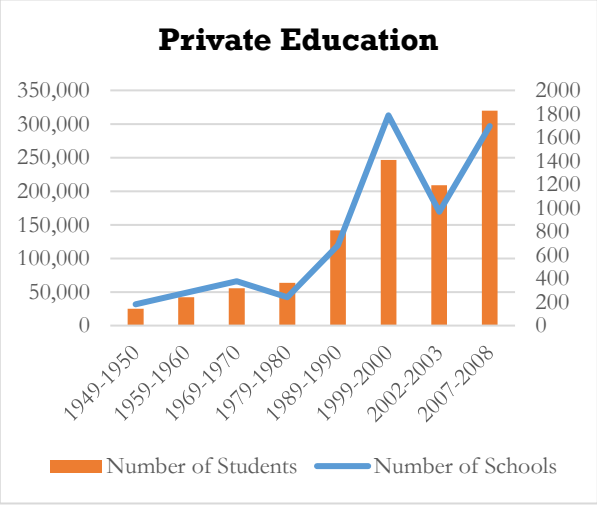
Figure 1:Budget of Ministry of Education Turkey
Source: Egitim Sen (2011)



investing sufficiently into education: Turkey is spending relatively higher amounts on tertiary education while expenditures on primary and secondary education are significantly below the OECD averages. However, private and social returns to primary and secondary schooling turn out to be quite high in Turkey, investing in these areas could influence the education and earning disparities. “Government expenditure is decreasing and becoming more biased towards tertiary education, which in turn decreases the chances of poor household utilizing these services “(Duman, 2008:370).

In addition, increase in the private schooling could farther lower the levels of intergenerational mobility in education and income. Intergenerational educational mobility is one of the lowest among the OECD countries, with 66% of young people having only the same level of education as their parents. This influences a low level of intergenerational mobility in income and makes it harder for children of poor families to break the poverty chains (Davies et al., 2005).

Figure 2: Private Education Enrollments
Source: Akkaymak (2012)



Higher education is largely subsidized by the government. According to Caner et al. (2012) on average public university students are poorer than those who fail in the exam; therefore, public provision of higher education seems to be supporting the poor families. “However, the fact that higher income students are more likely to attend higher subsidy and better-known universities indicate that there are regressive distributional effects of government subsidies for higher education among their recipients” (Caner, 2012:4).

It is true that the government has implemented many projects, such as the Basic Education project (BEP), 1999-2007, aiming to create an information society and spending US$1,280,900. Also, including

> “the Catch the Era in Education 2000 project, the Schooling and Credit System, curricula laboratory schools, computer laboratory schools, computer experimental schools, the High School Graduates’ Vocational Training Programme, the Improving Vocational Technical Education project, the Seeing Eye project and the Eskisehir Software Base Young Entrepreneur Training Centre (which lost 1 million Turkish lira; Minister of Industry and Trade on the behalf of the Prime Ministry, 2009)”,

however, for most of the cases the Turkish government has made the same mistake, it has never evaluated the effectiveness and outcomes of those projects, and simply has declared them as a success.

Government started supporting private schools and providing financial incentives to families (on average government subsidizes 20% of full tuition in private kindergartens, primary schools and high schools). The government supports private enterprise through tax breaks and land grants (Sayılan 2006). The declining public resources and lower quality education at public schools have led to an explosive increase in the numbers of private

tutoring institutions preparing students for entrance exams to secondary schools and universities (Tansel and Bircan 2006). Public education has increasingly come to be seen as an outdated concept, and the notion that education is a service which should be bought by the consumers has become prevalent (Unal 2005). Total private education expenditure in Turkey is higher than in most of the OECD countries. In 2011, 13% of all education expenditures were made by households (Acar et al. 2016).

3.3 The Key Reforms

The Conditional Cash Transfers (CCTs)

After the economic crisis of 2001, the World Bank and the Turkish government signed the loan agreement to start the Turkish CCT program with the implementation of Social Risk Mitigation Project (SRMP). The CCT program provides cash payments to poor households with the condition that they will meet certain behavioral requirements (usually related to the education and health of their children). Originally the CCT program aimed to help the poorest 6% of the population, but later under the AKP rule it was extended to the poorest 12%. According to the Implementation Completion and Results Report of the Social Risk Mitigation Project, as of March 2007, the CCT had a total of 2,68,954 beneficiaries and the total amount of payments was YTL 794,838,272 (World Bank, 2008)[7]. As of 2012, 2,034,065 were benefiting from conditional educational transfers.

[7] Ministry of Family and Social Policy. 2012. *Qualitative and Quantitative Analysis of Impact of Conditional Cash Transfer Program in Turkey Project Report*, Ankara: Ministry of Family and Social Policy.

Interestingly, findings show that most the CCT recipients do not know why they receive those transfers. They are also unsure about the source of transfers, some think it is municipalities that distribute them, others think it is simply a charity. Households also seem to confuse conditional assistance with unconditional money transfers (they do not know that they receive more money for girls attending schools than boys, or that the amounts vary by the education level).

Even though the idea of CCTs is to create positive behavioral changes, there does not seem to be enough evidence to support assumption that low school enrolment rates, or health issues of children, are related to the bad decisions made by poor families. Even in the absence of CCTs families still would want to educate their children regardless of their gender. The majority of households are aware of the benefits of education, and it is mostly economic constraints rather than family behavior that impact the choices. The key challenges of CCT in Turkey are inadequate amounts of transfers, exclusion of many children and families who are in fact in need of assistance, and irregularity of payments.[8] Nearly 90% of the recipients in Istanbul region find transfers insufficient.[9] Even if the CCT project succeeds in solving the households' economic problems, there still are institutional and socio-cultural reasons why households refrain from sending their children, and

[8] UNICEF. 2014. Türkiye'de Şartlı Nakit Transferi Programının İyileştirilmesine Yönelik Politika [The Policy Document for the Improvement of Conditional Cash Transfers in Turkey]. Ministry of Family and Social Policy. Belgesi: UNICEF. Accessed June 30.

[9] Yoruk, Erdem. 2012. "Welfare Provision as Political Containment: The Politics of Social Assistance and the Kurdish Conflict in Turkey." *Politics and Society* 40: 517–547. 10.1177/0032329212461130

particularly their girls, to school. Among these, supply-side factors such as an inadequate number of schools or transportation are very crucial (Pop, 2012).

As mentioned in the Introduction part of the paper, we are analyzing the burden of the out-of-pocket expenditures on education by levels of education, and across income groups. Finding out whether or not education financing in Turkey presents a bias against the poor and a bias in favor of higher education will help us evaluate the AKP policies and overall equity in the Turkish education system. The statistics presented in Table 1 and Table 2 show that compared to the OECD countries Turkey spends less on education. In addition, the public spending in Turkey is biased against the primary and secondary levels of education (expenditures on those levels of education are three times less than in the OECD countries). These raise concerns regarding the equitability of the education financing. The Turkish government heavily invests into tertiary levels, and spends 5% of GDP on education (including expenditure of implementation of the projects described above), however, are those spending adequate and efficient, do they decrease the inequality, and do they lead to improvements in the accessibility of education? It is crucial to answer those questions, so that public revenues are not simply spend on projects that do not generate any benefits.

Law on Making Amendment on Primary Education "4+4+4 Law"[10]

On February 21, 2012 draft law "Bill of Amending the Primary Education Law and other Laws" was presented to the Grand National Assembly of Turkey. The ruling Justice and Development Party (AKP) proposed a legislation dividing the eight-year primary education into two stages, each lasting four years. It also allowed distance education and apprenticeship training starting from the age of 10. Even though the discussions in the General Assembly were very fierce and NGOs and the opposition heavily criticized the proposed legislation, the bill was passed on March 30, 2012.

The "4+4+4" education system, which was implemented suddenly and without any pilot implementation, extended compulsory education to twelve years. Since then it has been criticized and supported by the public. "The circles, which approve "4+4+4" education system in terms of developmental features of children (Öztürk, 2012), vocational education (Öztürk, 2012) and equal opportunities in education (Ünal, 2012), have evaluated the practice as a "great step in education" (Erdoğan, 2012)." The ones who opposed it see it as a breakaway from secular and democratic line in education.

One of the main concerns of the critics is the age of starting primary school was one of the main concerns of critics. Previously, children of 72 months were allowed to start school, however, with the new law 5 years-old can start their education. This change allows 60 months children to enter primary school, and therefore requires schools to host two times

[10] The reform effects are not measured by our research (as we only look at the years 2004-2012). Description is simply presented to familiarize reader with the Turkish education reforms.

more students than before. Schools not only lacked the infrastructure, but also do not have teachers and curriculums ready for accepting 60-month-olds.

In addition, are concerns regarding the transition to middle schools at the end of the fourth grade. Critics state that the fifth grade is too early for children to be "steered away from a basic curriculum and be asked to make vocational choices about how to spend the rest of their life"[11]. NGOs and women rights' groups claim that this reform would "rekindle child labor, increase child brides and condemn girls to illiteracy"[12]. Experts also state that the new system would hurt the less privileged: children from poor families or who only know Kurdish language, when they enter the first grade, will be hurt when they compete for middle school. They will not be able to overcome their handicap by the end of the fourth grade and will be unable to perform well on the competitive examinations required for entering middle schools.

[11] Finkel A. (2012) "What's 4+4+4?" https://latitude.blogs.nytimes.com/2012/03/23/turkeys-education-reform-bill-is-about-playing-politics-with-pedagogy/?_r=0

[12] Sevinc K. (2012) "4+4+4 formula in Turkish educational system would increase the number of child marriages and instances of child labor in Turkey" https://kadersevinc.blogactiv.eu/2012/03/05/444-change-in-turkish-educational-system-would-increase-the-number-of-child-marriages-and-instances-of-child-labor-in-turkey/

"FATIH Project"[13]

Since 1984, there have been several Information and Communications Technology (ICT) projects implemented in Turkey, and financed by the government (at a taxpayer cost of billions).

The "FATIH Project" (which stands for *Fırsatları Artırma ve Teknolojiyi İyileştirme Hareketi,* or 'Movement to Increase Opportunities and Technology') was launched in 2011 and is valued at US$8 billion of the national budget. Its goal is to enhance the technological infrastructure of classrooms and to provide all students with tablet computers (distributing 14 million tablets and 570,000 interactive whiteboards to students and teachers). The project has some issues faced not only in Turkey, but in the other countries where similar "1-to-1 computing" projects have been implemented.

> "Although many countries are aggressively implementing the One Laptop per Child (OLPC) programs, there is lack of empirical evidence on its effects… no evidence is found of the program's effects on enrolment and test scores in Mathematics (numeracy) and language." (Christia et al, p.1)

Supporters of the project claim that FATIH reform will help Turkey become a knowledge society, and lead to a new era. The focus is to equip teachers with knowledge and skills, therefore advanced technology should be center of creating better education. Opponents emphasize that there are more urgent issues in Turkey such as overcrowded classrooms, insufficient school facilities, poor in-service training, paid, contract and

[13] FATIH project is not covered by our data analysis. We present it to provide general characteristics of AKP education policies.

substitute supply teachers, old curricula. Therefore, the FATIH project, which costs US$8 billion is more of a luxury than an efficient investment.

The project has risen more concerns after issues of some tables being lost or stolen, hundreds of hardwares having technical dysfunctions and some interactive whiteboards being delivered to schools but remaining uninstalled. The government has been criticized for implementing project and declaring it successful, without ever evaluating whether the successful outcomes have been achieved.

IV. The Data and Methodology

4.1 Measurement of Education Equity

To evaluate the progressivity of the education expenditures we will use the Household Budget Surveys collected by the Turkish Statistical Institute between 2004 and 2012. The Household Budget surveys provide information on household expenditures, income without direct tax, and transfers (including social insurance as well as welfare transfers) received. Most crucially the surveys also provide information on education expenditures. For the methodology part, we will follow O'Donnel et al. (2008) guidelines on analyzing health equity, however, instead of measuring health statistics we will concentrate on education indicators. Previous studies mostly estimate equity in education concentrating on the public expenditures on higher education. In our study, we will address equity of education financing from the individual side, analyzing private out-of-pocket expenditures across different income groups and different education levels.

Instead of using the total income indicators, we substitute them by O'Donnel's (2008) measurement of the "Ability to Pay" (ATP), calculated by division of total household expenditures (or total income, total income excluding transfers) by the square root of the number of household members. Using ATPs, we will present Lorenz and Concentration curves. Lorenz curves will show the proportion of the ATP cumulatively earned by the

different income quintiles. It will simply display the ATP distribution. Concentration curves show the relationship between the cumulative percentage of the population ranked by income (in our case ATP) and the cumulative percentage of education expenditures. Concentration curves will present the financial burden of education on different income quintiles.

In addition, we will calculate the Gini coefficient. The Gini coefficient is defined as twice the area between the Lorenz curve and the line of equality. It takes values between 0 and 1, where 0 indicates perfect equality and 1 indicates perfect inequality. Also, in order to measure degree of socioeconomic inequality we will derive concentration indices, defined as twice the area between the concentration curve and the line of equality. Concentration index takes values between -1 and 1. Negative concentration index represents inequality in financing education.

Below you can see mathematical definition of concentration curve.

(1) $C = 1 - 2\int_0^1 L\ e(p)dp$ where *e* is education related variable and *p* is population.

For a discrete variable, it can be written as

(2) $C = \frac{2}{N\mu} \sum_{i=1}^{n} e_i r_i - 1 - \frac{1}{N}$ where e_i is the education variable, μ is its mean, and r_i is the fractional rank[2] of individual *i* in the ATP distribution.

Also, concentration index can be defined as the covariance between education variable and the fractional rank in the ATP distribution (Lerman and Yizhaki 1989).

(3) C = cov(e,r) where *e* is education variable and *r* is the fractional rank.

Finally, to determine level of inequality composed of income inequality (Gini coefficient) and socioeconomic inequality (Concentration index) we will calculate Kakwani indices, simply subtracting Gini coefficient from the Concentration index, π_K = C – G, where C is the concentration index, G is the Gini index, and π_K Kakwani index ranges from -2 to 1. A negative Kakwani index represents a regressive financing system, while a positive index represents a progressive financing system.

The Household Budget Surveys also provide information on expenditures by education levels: primary, middle, high and tertiary. This gives us opportunity to conduct analysis for different education levels, therefore we will not only analyze the education financing relative to different incomes (incomes excluding social and welfare transfers), but also evaluate education financing for different education levels.

4.2. Data

The Turkish Statistical Institute has been collecting the Household Budget Surveys since the year of 2003. The survey provides information on household expenditures for the following items:

1. Food and Non-alcoholic Beverages
2. Alcoholic Beverages, Cigarettes, Tobacco, and Other narcotics

3. Clothing and Footwear
4. Housing and Utility systems
5. Furniture and Other Household Appliances
6. Health Services
7. Transportation Services
8. Communication Services
9. Recreation
10. Education Services
11. Restaurants and Accommodation Services
12. Other (personal items, insurances, social protection services etc.)

Using the Household Budget Surveys, we calculate total household expenditures and total expenditures on education (item #10 in the list). We are also able to calculate education expenditures separately for each level: primary, middle, high school and tertiary education expenditures. In addition to the measures on expenditure, the Household Surveys provide information on household incomes. The Surveys not only include total yearly incomes, but also provide data for the social and welfare transfers. In our research we concentrate on measuring out-of-pocket expenditures on education.

In order to analyze impact of social and welfare transfers on education expenditures, we estimated five different indicators of "Ability to Pay" (ATP) by using five different income measures: (1) total income; (2) total income excluding welfare transfers (including

social transfer); (3) total income excluding social transfers; (4) total income excluding welfare and social transfers; and (5) total expenditure.

To measure amount of social transfers we calculate total revenues from annual pension income; annual pension income from abroad; annual widow, orphan salary; and annual assistance, scholarships, etc. obtained from abroad. For welfare transfers, we sum up revenues received from annual old-age pension; annual social welfare; annual veterancy and invalidity wage; annual student scholarship income; annual unemployment benefit; annual direct support (fuel, milk payment); annual income from the state; annual child support, assistance, etc. obtained from private persons and institutions; and annual income from private individuals.

Table 3 shows the number of households used in our study.

Table 3: Number of Households used in the study.

Year	Number of Households
2004	924
2005	1,090
2006	1,236
2007	1,183
2008	2,108
2009	2,696
2010	422
2011	2,812
2012	2,984

As a first step, we estimate Lorenz Curves using "Ability to Pay" (ATP) indicators, measured in five different ways:

$$\text{ATP1 is estimated by } \frac{\text{Total Income}}{\sqrt{\text{number of households}}}.$$

$$\text{ATP}_2 \text{ is estimated by } \frac{\text{Total Income}-\text{Welfare Transfers}}{\sqrt{\text{number of households}}}.$$

$$\text{ATP}_3 \text{ is estimated by } \frac{\text{Total Income}-\text{Social Transfers}}{\sqrt{\text{number of households}}}.$$

$$\text{ATP}_4 \text{ is estimated by } \frac{\text{Total Income}-\text{ Transfers(Welfare and Social)}}{\sqrt{\text{number of households}}}.$$

$$\text{ATP}_5 \text{ is estimated by } \frac{\text{Total Expenditure}}{\sqrt{\text{number of households}}}.$$

From the five ATPs, firstly we want to distinguish ATP_1 and ATP_4. Calculating education expenditure as a share of total income (ATP_1) and total income excluding the transfers (ATP_4) will allow us to evaluate the household dependence on transfer payments. Afterwards, we want to evaluate the role of different types of transfers by formally decomposing them into two groups: social transfers and welfare transfers.

Estimating Lorenz Curves helps us illustrate income inequality. Using ATP measures, we calculate Gini indices which display exact income inequality levels.

For evaluating burden of education financing, we graph the Concentration curves, which display the education expenditures (as a share of income) for each quintile. Estimation of concentration indices provides information on the expenditure contributions. If index is negative it implies disproportionate spending scheme.

To calculate Concentration Curves, we use two approaches. First, we calculated Concentration Curves by dividing total education expenditures by ATPs ($\frac{\text{Household Education Expenditures}}{\text{ATP}}$); and the second method, we divide expenditures for different education levels by ATPs ($\frac{\text{Primary Education Expenditures}}{\text{ATP}}$).

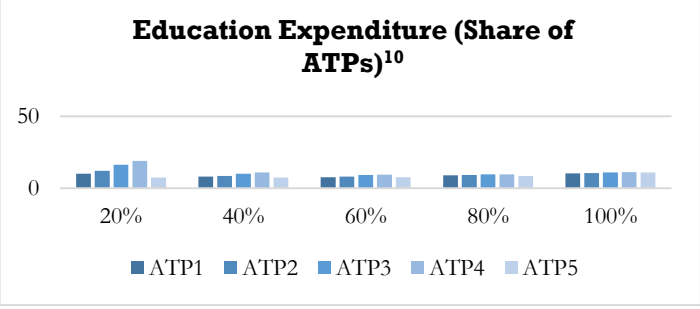
Lastly, we measure Kakwani indices (Concentration Index – Gini Index). Kakwani index combines income inequality and socio-economic inequality and presents overall inequality levels. Index can take values between -1 and 1. Lower the index value more regressive (inequitable) is the system, higher the index value more progressive is the system.

4.3. Findings

Firstly, based on income distribution our findings show that Turkey has been an unequal society. Gini coefficients have not improved since the year of 2004 and on average have equaled 0.40, which is above the OECD average of 0.315 (2010).

Secondly, contrary to all the previous researches, we find that during 2004-2012 education expenditure as a share of income (adjusted to the household size) always exceeded 2-3% and was above 7%. Shares of education expenditure vary with the ATPs. If we look at the shares of education as a part of total income (ATP_1), or total expenditure (ATP_5) we observe values varying between 7.32% and 10.98%. However, if we look at the shares of education as part of income without transfers (ATP_4) values vary between 9.52% and 19.08%.

Figure 3: Education Expenditure as a Share of ATPs



[13] Total Education Expenditure as a Share of ATPs, average of years 2010, 2011, 2012.

Our results highlight that groups with low incomes highly depend on transfer payments. If we do not include transfer payments, poor families spend 2 out of every 10 YTLs on education. Whereas groups with high incomes spend only 1 out of every 10 YTLs on education. This spending scheme gives high income groups ability to save more than the poor families can afford. Assuming the quality of education received by different quintiles is same, the system still disadvantages the poor by placing heavier financial burden on them.

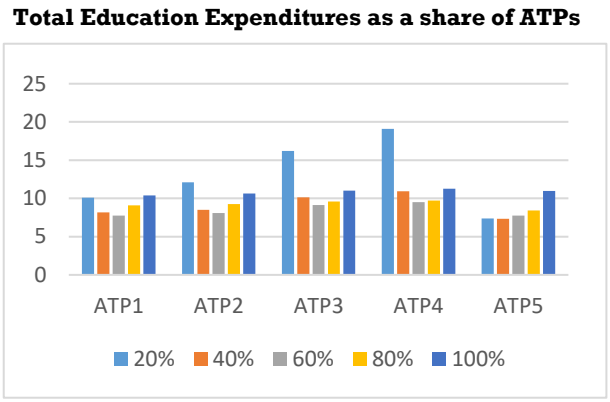


Figure 4: Total Education Expenditures as a share of ATPs[13]

When we analyze results according to the ATPs, we notice that for the ATP_3 and ATP_4 (which exclude social transfers) the poorest quintiles have the highest expenditures (the lowest income group spends 16.21% of the income on education, whereas highest income group spends only 11.01%).

For the ATP_1 and ATP_2 (total income and total income excluding welfare transfers) up till the year of 2007, 2nd and 3rd quintile expenditures exceeded expenditures of the other groups, however, since 2008 the poorest quintile has had the highest expenditure.

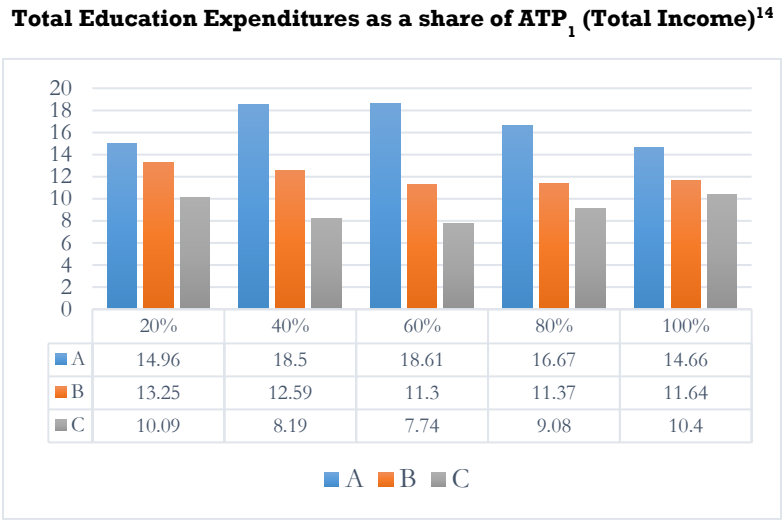


Figure 5: Total Education Expenditures as a share of ATP1

The third and the most important finding is the negative Concentration Index values for the majority of the years across all the ATPs. Negative concentration indices imply disproportionate burden of education financing and also result in negative Kakwani indices. Values of Kakwani indices indicate the regressivity of the system. Furthermore, not only Kakwani indices are negative for all the years, but also there are no significant improvements during the period of 2004-2012.

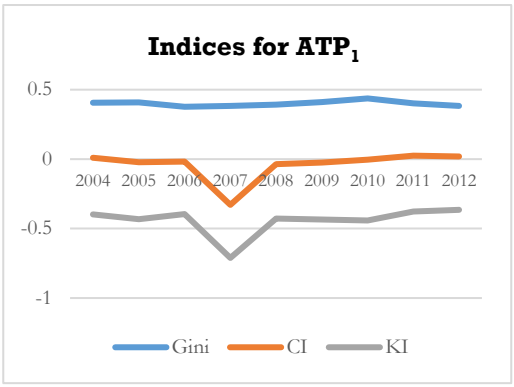


Figure 6: Indices for ATP1

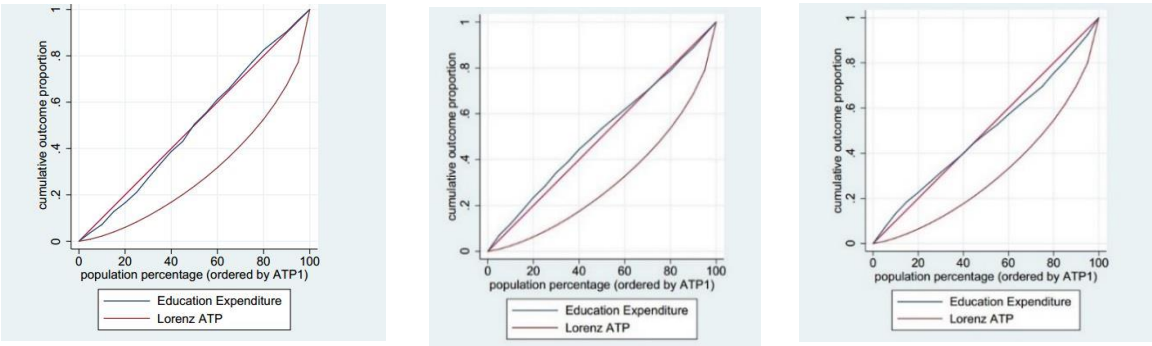
[14] A= average of 2004, 2005, 2006; B = average of 2007, 2008, 2009; C = average of 2010, 2011, 2012.

This means that during the last decade the education system has not seen any advancement with regards to financing equity. Inequitable (regressive) system raises concerns regarding the social mobility. Higher education expenses as a share of out-of-pocket expenditures indicate that it will be harder for low-income families to invest in their children's education, and provide them with the opportunities that their high-income peers have.

If we graphically examine ATP_4 (see below graph 1, ATP_4) we notice that between years 2004 and 2012 the non- transfer income of the poorest quintiles has collapsed. Thus we have the higher education expenditure as a share of "Ability to Pay". Decomposition of transfers show that households depend more on social transfers rather than on welfare transfers.

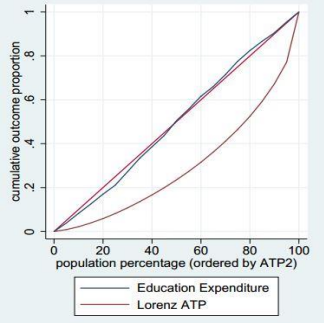
Graph 1:

ATP_1

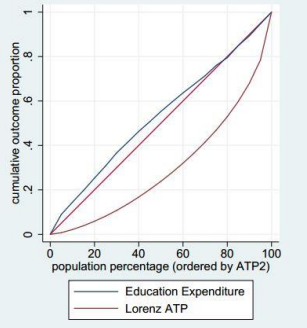


2004 2008 2012

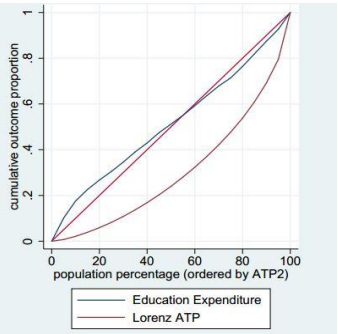
ATP$_2$



2004

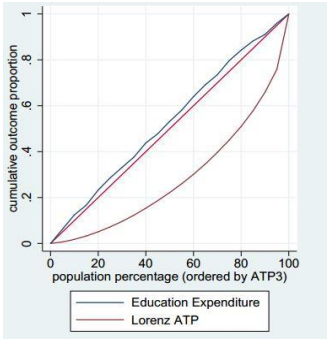


2008

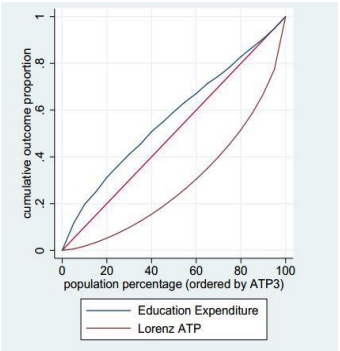


2012

ATP$_3$



2004



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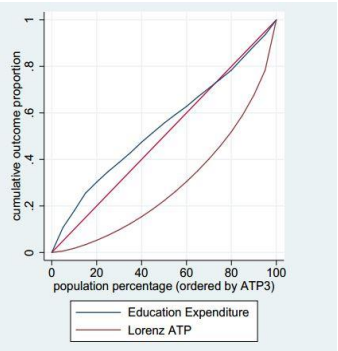
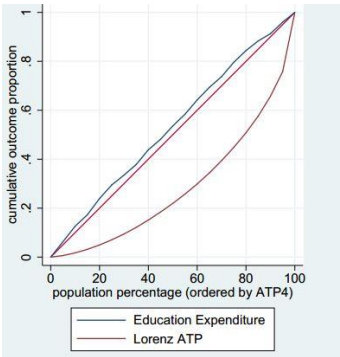
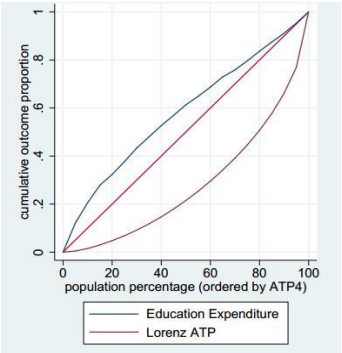


2012

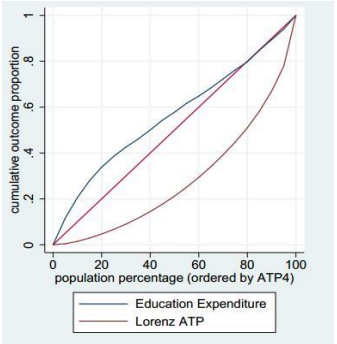
ATP$_4$



2004

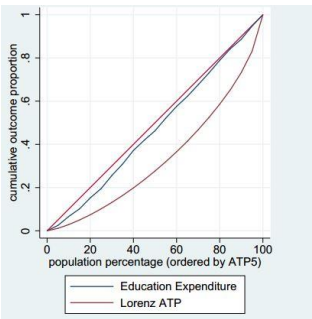


2008

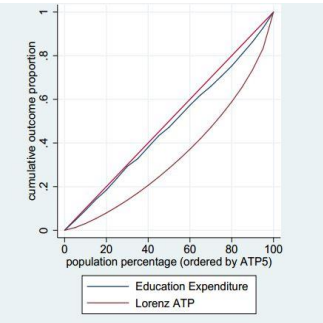


2012

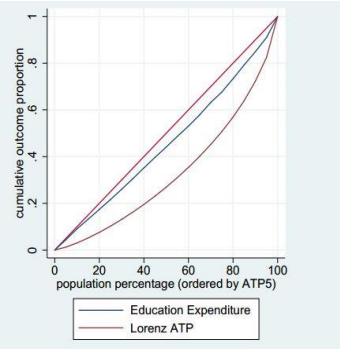
ATP$_5$



2004



2008



2012

Table 4: A = average of 2004, 2005, 2006
B= average of 2007, 2008, 2009
C = average of 2010, 2011, 2012

ATP$_1$								
Years	**20%**	**40%**	**60%**	**80%**	**100%**	**Gini Index**	**Concentration Index**	**Kakwani Index**
2004	13.87	18.51	18.86	17.71	14.64	0.407	0.010	-0.398
2005	15.25	16.93	17.85	16.04	13.83	0.409	-0.023	-0.432
2006	15.74	20.06	19.12	16.26	15.51	0.377	-0.018	-0.395
A	**14.96**	**18.50**	**18.61**	**16.67**	**14.66**	**0.40**	**-0.01**	**-0.41**
2007	17.53	17.92	16.54	16.63	15.04	0.382	-0.329	-0.711
2008	11.71	10.46	8.67	8.45	10.56	0.392	-0.036	-0.428
2009	10.53	9.41	8.69	9.02	9.32	0.410	-0.025	-0.435
B	**13.25**	**12.59**	**11.30**	**11.37**	**11.64**	**0.39**	**-0.13**	**-0.52**
2010	10.04	7.88	7.07	9.81	8.90	0.437	-0.004	-0.441
2011	9.32	8.35	7.83	8.59	10.50	0.401	0.025	-0.376
2012	10.90	8.34	8.32	8.83	11.80	0.384	0.019	-0.365
C	**10.09**	**8.19**	**7.74**	**9.08**	**10.40**	**0.41**	**0.01**	**-0.39**

ATP$_2$								
Years	**20%**	**40%**	**60%**	**80%**	**100%**	**Gini Index**	**Concentration Index**	**Kakwani Index**
2004	14.33	18.23	19.45	17.77	14.60	0.410	0.006	-0.404
2005	15.98	17.71	17.77	15.88	14.07	0.412	-0.031	-0.443
2006	16.79	20.14	19.77	16.07	15.74	0.381	-0.023	-0.404
A	**15.70**	**18.69**	**19.00**	**16.58**	**14.81**	**0.40**	**-0.02**	**-0.42**
2007	17.95	18.58	16.67	16.42	15.30	0.385	-0.036	-0.421
2008	13.36	11.08	9.15	8.36	10.82	0.404	-0.066	-0.470
2009	13.53	9.41	9.44	9.45	9.34	0.423	-0.072	-0.495
B	**14.94**	**13.02**	**11.75**	**11.41**	**11.82**	**0.40**	**-0.06**	**-0.46**
2010	11.23	8.29	7.60	9.96	8.92	0.448	-0.026	-0.474
2011	11.29	8.82	8.18	8.94	10.72	0.412	-0.013	-0.425
2012	13.85	8.39	8.44	8.89	12.22	0.396	-0.027	-0.423
C	**12.12**	**8.50**	**8.07**	**9.26**	**10.62**	**0.42**	**-0.02**	**-0.44**

ATP_3 Years	20%	40%	60%	80%	100%	Gini Index	Concentration Index	Kakwani Index
2004	23.02	20.32	19.92	20.00	15.62	0.433	-0.058	-0.491
2005	23.33	20.55	19.26	18.03	14.05	0.433	-0.093	-0.526
2006	25.17	21.75	18.21	19.86	16.08	0.401	-0.079	-0.480
A	**23.84**	**20.87**	**19.13**	**19.30**	**15.25**	**0.42**	**-0.08**	**-0.50**
2007	25.85	22.38	17.80	17.45	15.82	0.409	-0.106	-0.515
2008	19.45	12.18	10.18	9.84	10.67	0.425	-0.136	-0.561
2009	17.10	11.97	8.81	9.53	9.94	0.443	-0.121	-0.564
B	**20.80**	**15.51**	**12.26**	**12.27**	**12.14**	**0.43**	**-0.12**	**-0.55**
2010	15.67	10.64	8.99	9.82	9.11	0.471	-0.102	-0.573
2011	14.85	9.45	9.19	9.57	10.97	0.436	-0.060	-0.496
2012	18.12	10.29	9.20	9.35	12.94	0.422	-0.086	-0.508
C	**16.21**	**10.13**	**9.13**	**9.58**	**11.01**	**0.44**	**-0.08**	**-0.53**

ATP_4 Years	20%	40%	60%	80%	100%	Gini Index	Concentration Index	Kakwani Index
2004	23.94	19.96	20.37	20.24	15.56	0.436	-0.063	-0.499
2005	24.39	21.40	19.71	17.46	14.45	0.436	-0.101	-0.537
2006	25.60	22.82	18.95	19.93	16.37	0.406	-0.086	-0.492
A	**24.64**	**21.39**	**19.68**	**19.21**	**15.46**	**0.43**	**-0.08**	**-0.51**
2007	26.78	22.75	17.73	17.95	15.93	0.412	-0.110	-0.522
2008	21.52	13.47	10.68	9.96	10.86	0.438	-0.163	-0.601
2009	20.98	12.48	9.79	9.79	10.41	0.457	-0.160	-0.617
B	**23.09**	**16.23**	**12.73**	**12.57**	**12.40**	**0.44**	**-0.14**	**-0.58**
2010	17.55	11.79	9.40	9.60	9.45	0.483	-0.124	-0.607
2011	17.78	10.49	9.56	9.96	11.27	0.450	-0.101	-0.551
2012	21.92	10.54	9.60	9.68	13.14	0.437	-0.126	-0.563
C	**19.08**	**10.94**	**9.52**	**9.74**	**11.28**	**0.46**	**-0.12**	**-0.57**

ATP_5 Years	20%	40%	60%	80%	100%	Gini Index	Concentration Index	Kakwani Index
2004	12.44	17.81	16.52	17.33	17.24	0.336	0.056	-0.280
2005	10.53	13.83	16.47	16.21	13.68	0.355	0.053	-0.302
2006	13.14	16.72	17.39	15.79	15.67	0.333	0.026	-0.308
A	**12.04**	**16.12**	**16.79**	**16.44**	**15.53**	**0.34**	**0.04**	**-0.30**
2007	13.51	15.12	16.28	15.65	16.16	0.319	0.030	-0.289
2008	8.19	8.72	8.55	8.00	10.99	0.327	0.046	-0.281
2009	7.39	8.00	8.27	8.27	11.13	0.333	0.078	-0.255
B	**9.70**	**10.61**	**11.03**	**10.64**	**12.76**	**0.33**	**0.05**	**-0.28**
2010	7.29	7.09	7.55	8.24	10.11	0.374	0.089	-0.285
2011	7.14	7.01	7.83	8.10	11.06	0.352	0.095	-0.257
2012	7.68	7.85	7.88	8.95	11.78	0.348	0.091	-0.257
C	**7.37**	**7.32**	**7.75**	**8.43**	**10.98**	**0.36**	**0.09**	**-0.27**

Analysis of education expenditures by education levels lead to additional conclusions. Income groups spend most on the high school education, however, the richest quintile spends most on the primary education. This trend can be explained by the following argument: High-income families know that investments in the earlier stages of education are more effective, if student gets better quality of education from the primary school, s/he will be able to perform better in the higher levels of education as well. For the poor quintiles story is a little bit different, they invest most on high school education because high school is a final step before entering the tertiary institution. Low-income families do their best at the high school level (by spending the most) in order to provide their children with resources sufficient for performing well on national university examinations. Expenses during high school education increase due to the additional cost accrued from services provided by private preparatory institutions (tutoring classes outside of regular schools).

If we evaluate school levels in terms of regressivity (Kakwani index), we observe that the secondary education, specifically high school expenditures are most inequitable (Kakwani index value of -0.62).

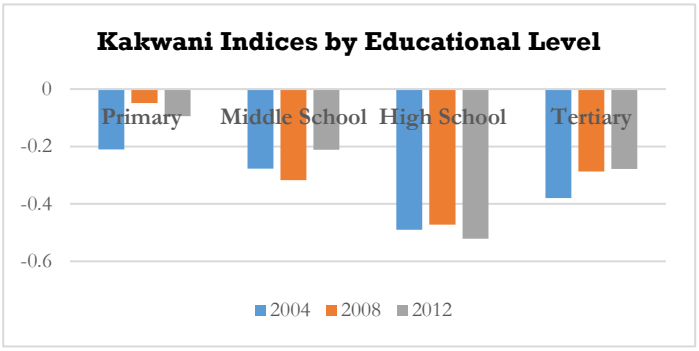


Figure 7: Kakwani Indices by Educational Level

The tertiary education is the second most inequitable (Kakwani index value of -0.42), which implies that even though government has been investing heavily into tertiary education, we still do not see any significant improvements in terms of progressivity of the tertiary system. On the contrary, expenditures of the poorest quintiles have been increasing, whereas expenditures of the richest quintiles have either stayed the same or even slightly decreased. This indicates that subsidies to tertiary level education have benefited the richest quintiles rather than the poor.

Table 5: Primary = average of 2004, 2008, 2012; Middle School = average of 2004, 2008, 2012
High School = average of 2004, 2008, 2012; Tertiary = average of 2004, 2008, 2012

ATP_1

Years	20%	40%	60%	80%	100%	Gini Index	Concentration Index	Kakwani Index
Primary	1.81	1.58	2.15	1.91	3.72	0.40	0.16	-0.24
2004	2.76	2.07	3.79	2.78	3.97	0.413	0.087	-0.326
2008	0.91	0.98	0.77	0.80	2.52	0.394	0.210	-0.184
2012	1.77	1.70	1.89	2.15	4.67	0.386	0.188	-0.198
Mid. School	1.82	2.33	2.42	2.40	2.70	0.40	0.02	-0.38
2004	1.84	3.84	3.42	3.43	2.83	0.413	0.018	-0.395
2008	2.43	2.15	2.69	2.16	3.29	0.394	-0.045	-0.439
2012	1.20	0.99	1.15	1.61	1.98	0.386	0.088	-0.298
High School	4.49	4.63	4.59	3.79	2.45	0.40	-0.22	-0.62
2004	5.18	7.97	8.14	6.86	3.77	0.413	-0.176	-0.589
2008	4.15	3.64	3.02	2.62	2.09	0.394	-0.244	-0.638
2012	4.14	2.27	2.62	1.91	1.50	0.386	-0.245	-0.631
Tertiary	0.89	1.00	1.36	1.26	2.23	0.40	-0.03	-0.42
2004	0.71	1.09	1.20	1.18	2.18	0.413	-0.061	-0.474
2008	0.79	0.61	1.37	1.07	1.75	0.394	-0.043	-0.437
2012	1.17	1.32	1.51	1.52	2.76	0.386	0.025	-0.361

ATP_2

Years	20%	40%	60%	80%	100%	Gini Index	Concentration Index	Kakwani Index
Primary	2.00	1.63	2.12	1.97	3.78	0.41	0.14	-0.27
2004	2.76	2.08	3.83	2.75	4.01	0.416	0.086	-0.330
2008	0.91	1.13	0.74	0.83	2.56	0.408	0.188	-0.220
2012	2.33	1.66	1.79	2.33	4.77	0.402	0.143	-0.259
Mid. School	2.33	2.19	2.45	2.51	2.70	0.41	-0.01	-0.42
2004	2.76	3.26	3.39	3.44	2.83	0.416	0.002	-0.414

2008	2.66	2.37	2.75	2.37	3.24	0.408	-0.073	-0.481
2012	1.56	0.93	1.21	1.71	2.02	0.402	0.037	-0.365
High School	4.69	4.88	4.50	4.01	2.49	0.41	-0.23	-0.64
2004	5.44	8.24	7.77	7.07	3.77	0.416	-0.180	-0.596
2008	3.81	4.04	3.27	2.77	2.21	0.408	-0.249	-0.657
2012	4.84	2.38	2.46	2.18	1.50	0.402	-0.270	-0.672
Tertiary	1.15	1.10	1.40	1.48	2.21	0.41	-0.28	-0.69
2004	0.71	1.10	1.39	1.60	2.18	0.416	-0.066	-0.482
2008	0.86	0.79	1.42	1.11	1.70	0.408	-0.732	-1.140
2012	1.88	1.41	1.39	1.74	2.76	0.402	-0.051	-0.453

ATP_3

Years	20%	40%	60%	80%	100%	Gini Index	Concentration Index	Kakwani Index
Primary	2.25	1.87	2.12	2.23	4.15	0.45	0.08	-0.38
2004	3.10	2.66	3.55	3.27	4.63	0.472	0.039	-0.433
2008	1.38	0.92	1.14	0.97	2.62	0.444	0.077	-0.367
2012	2.27	2.04	1.68	2.46	5.19	0.434	0.109	-0.325
Mid. School	3.10	2.84	2.82	2.74	2.85	0.45	-0.08	-0.53
2004	3.89	4.78	3.43	4.03	2.96	0.472	-0.097	-0.569
2008	3.68	2.75	3.33	2.61	3.45	0.444	-0.151	-0.595
2012	1.72	0.98	1.71	1.59	2.15	0.434	0.004	-0.430
High School	5.78	6.32	5.60	5.09	2.36	0.45	-0.28	-0.73
2004	6.54	10.41	9.46	9.13	3.67	0.472	-0.232	-0.704
2008	5.85	4.98	4.19	3.01	2.03	0.444	-0.312	-0.756
2012	4.94	3.57	3.14	3.14	1.39	0.434	-0.285	-0.719
Tertiary	2.52	1.85	1.53	1.81	2.15	0.45	-0.19	-0.64
2004	0.80	2.38	2.05	2.08	1.60	0.472	-0.179	-0.651
2008	2.22	1.28	1.05	1.71	1.70	0.444	-0.183	-0.627
2012	4.54	1.89	1.49	1.63	3.16	0.434	-0.207	-0.641

ATP_4

Years	20%	40%	60%	80%	100%	Gini Index	Concentration Index	Kakwani Index
Primary	2.46	2.27	2.73	2.51	4.00	0.47	0.04	-0.43
2004	2.95	2.87	3.52	3.29	4.64	0.477	0.038	-0.439
2008	1.49	1.06	1.16	0.94	2.73	0.453	0.043	-0.410
2012	2.95	2.87	3.52	3.29	4.64	0.477	0.038	-0.439
Mid. School	3.66	2.91	2.80	2.77	2.93	0.46	-0.11	-0.57
2004	4.49	4.57	3.31	4.14	2.97	0.477	-0.107	-0.584
2008	4.25	3.04	3.43	2.60	3.54	0.453	-0.179	-0.632
2012	2.25	1.14	1.66	1.59	2.27	0.448	-0.054	-0.502
High School	5.82	6.67	5.83	5.20	2.38	0.46	-0.29	-0.74
2004	6.62	10.31	9.77	9.23	3.67	0.477	-0.232	-0.709
2008	5.62	5.42	4.56	3.23	2.10	0.453	-0.315	-0.768
2012	5.23	4.26	3.15	3.15	1.38	0.448	-0.310	-0.758
Tertiary	2.89	2.12	1.61	1.78	2.18	0.46	-0.22	-0.68
2004	0.89	2.31	2.24	2.00	1.61	0.477	-0.185	-0.662

2008	2.43	1.46	1.18	1.71	1.74	0.453	-0.211	-0.664
2012	5.37	2.59	1.42	1.64	3.19	0.448	-0.255	-0.703

ATP_5

Years	20%	40%	60%	80%	100%	Gini Index	Concentration Index	Kakwani Index
Primary	1.51	1.60	1.43	2.25	3.56	0.34	0.22	-0.12
2004	2.59	2.86	1.98	3.53	3.95	0.346	0.136	-0.210
2008	0.72	0.58	0.85	0.85	2.38	0.327	0.278	-0.049
2012	1.23	1.36	1.46	2.37	4.36	0.348	0.254	-0.094
Mid. School	1.71	2.32	2.27	2.27	2.56	0.34	0.07	-0.27
2004	2.31	3.42	3.25	3.35	2.57	0.346	0.069	-0.277
2008	1.82	2.67	2.37	2.06	3.14	0.327	0.011	-0.317
2012	1.02	0.88	1.19	1.41	1.98	0.348	0.137	-0.211
High School	3.90	4.32	4.30	3.42	2.14	0.34	-0.15	-0.49
2004	5.92	7.53	7.98	6.33	2.99	0.346	-0.144	-0.490
2008	2.86	3.07	2.68	2.58	2.08	0.327	-0.145	-0.472
2012	2.91	2.36	2.24	1.34	1.34	0.348	-0.173	-0.521
Tertiary	0.67	0.90	1.18	1.75	2.21	0.34	0.03	-0.31
2004	0.47	0.79	1.11	1.52	2.40	0.346	-0.034	-0.380
2008	0.52	0.71	0.92	1.19	1.69	0.327	0.040	-0.287
2012	1.03	1.19	1.53	2.54	2.54	0.348	0.070	-0.278

These statistical findings are also supported by the theoretical discussion presented earlier in the literature review section. Ineffective educational policies and reductions in public spending not only failed to improve the inequality levels in Turkey, but at some educational levels even increased it (Hypothesis I). In addition, increases in tertiary education spending rather than investments in secondary levels of schooling highlight the importance of Hypothesis 2: Investments in lower levels of schooling are more effective in decreasing income inequality, and Hypothesis 3: Investments in higher education need to be justified, that they do not exacerbate the inequality levels. Poor have been financially most vulnerable and, except the decreases in absolute values of education expenditures have not seen improvements in the equitability of the system, the argument that education

in Turkey became more accessible to poor and the education policies have decreased the inequality are not supported by our findings.

It is important to remember that the education policies conducted by the Turkish government are financed by the tax revenues, poor have only limited (or no) access to public education on tertiary level yet finance public spending on education via taxes

V. Conclusion

"Whatever you do, do it well". Walter E. Disney

In this paper we analyzed equity in financing education in Turkey. We used the Household Budget Surveys to calculate total education expenditures and ATPs of households for the years 2004-2012. To measure inequality levels, we calculated Gini, Concentration and Kakwani indices.

Our findings present that since the year of 2004 there were no significant improvements in the distribution of education financing. By estimating Kakwani indices we found that the Turkish education system has been regressive and no significant improvements have been observed. The poorest quintiles have had the highest shares of education expenditures since the year of 2008. The crucial finding is that the high school education is the most inequitable, and the high public expenditures on the tertiary education are not justified, as they seem to benefit the rich more than the poor. These findings raise concerns regarding the intergenerational mobility of individuals. If it is low-income quintiles that face the heaviest burden of education financing, then the social mobility (by investing in human capital) becomes very challenging.

Our research also upholds previous hypotheses regarding the significance of public spending on education, and the importance of effective distribution of finances among education levels. Our results show that simple provision of education policies does not lead

to any improvements in the progressivity of the system. If the lack of education contributes to the perpetuation of inequality, and social and income inequalities have negative effects on economic and political environments, then it is in the interest of the Turkish government to implement effective education policies. By failing to evaluate effectiveness of already implemented policies, Turkish government not only impoverishes the poor, but also loses potential to attain more stable economic growth levels in the long run.

The scope of our research is very limited as it only covers the time between 2004-2012, however, by analyzing education equity during the Justice and Development Party period we intended to highlight that the evaluation of policies is of crucial importance.

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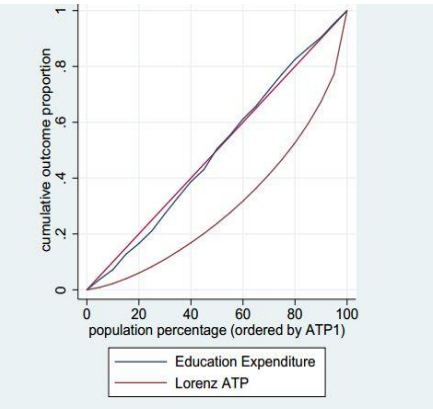
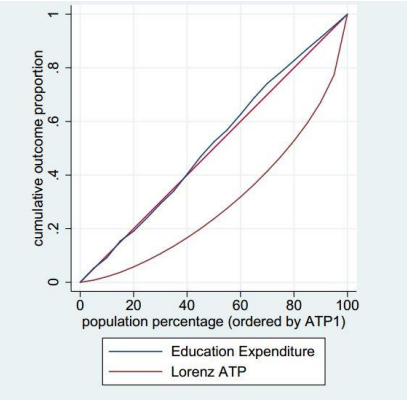
Appendix

Distributions of income and burdens of education expenditure presented for different years and different income types.

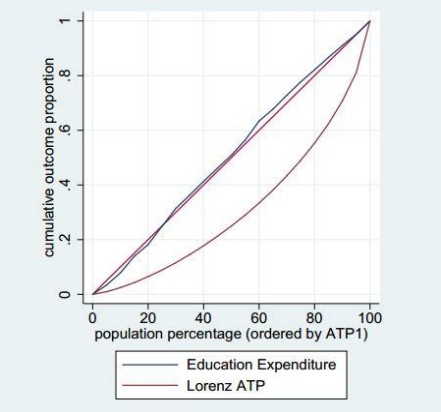
1) ATP_1; Concentration curve is calculated by $\frac{\text{Household education expenditures}}{\text{ATP1}}$.
   Where ATP1 is estimated by $\frac{\text{Total Income}}{\sqrt{\text{number of households}}}$.



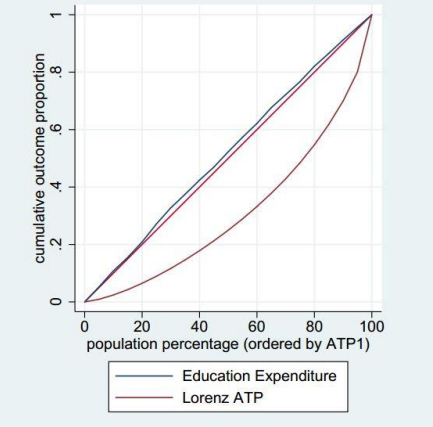
Graph 1: 2004



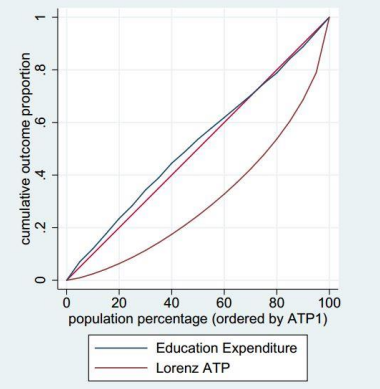
Graph 2: 2005



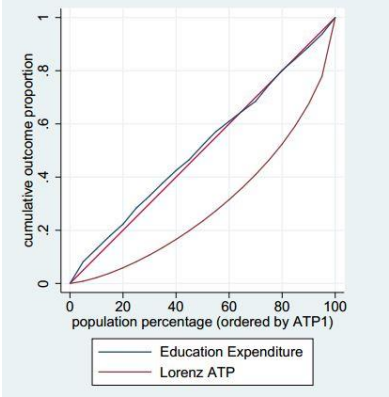
Graph 3: 2006



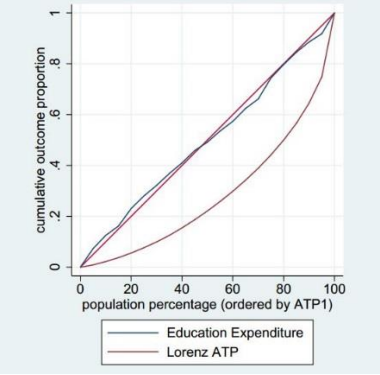
Graph 4: 2007



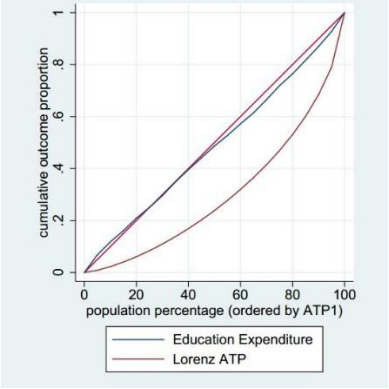
Graph 5: 2008



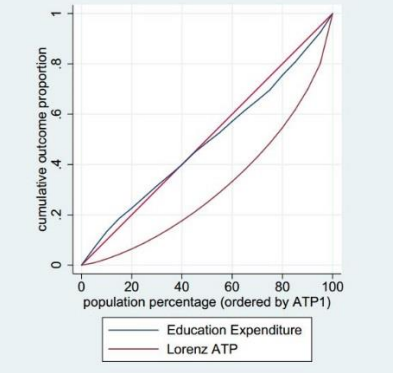
Graph 6: 2009



Graph 7: 2010

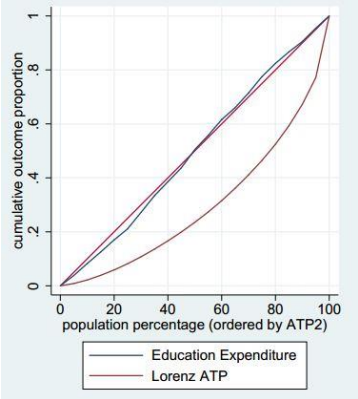


Graph 8: 2011

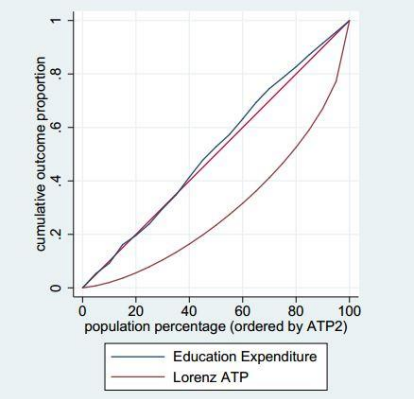


Graph 9: 2012

2) ATP_2; Concentration curve is calculated by $\frac{\text{Household education expenditures}}{\text{ATP2}}$.
Where ATP_2 is estimated by $\frac{\text{Total Income} - \text{Welfare Transfers}}{\sqrt{\text{number of households}}}$.



Graph 1: 2004



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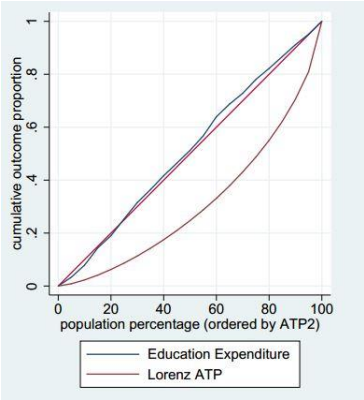

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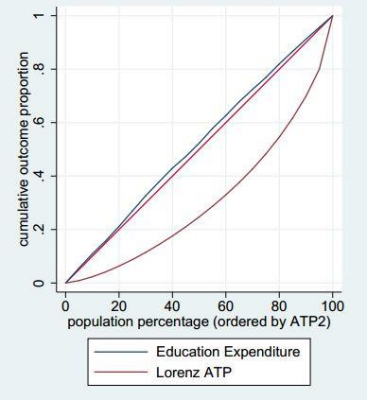

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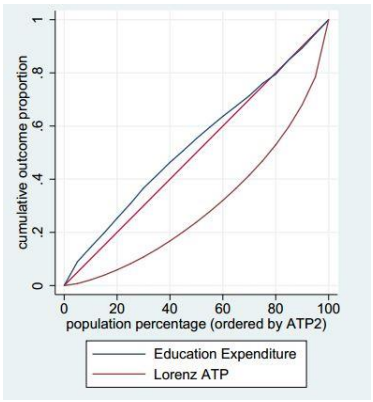

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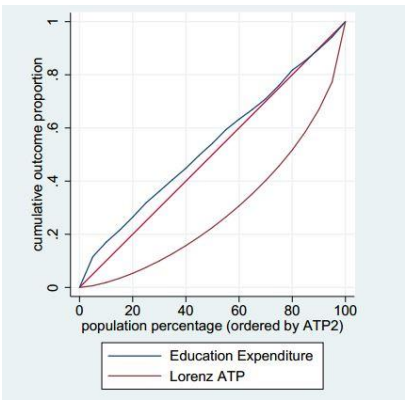

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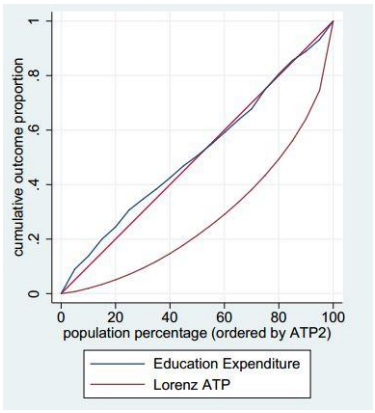

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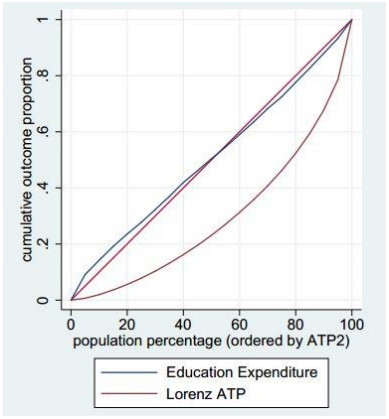

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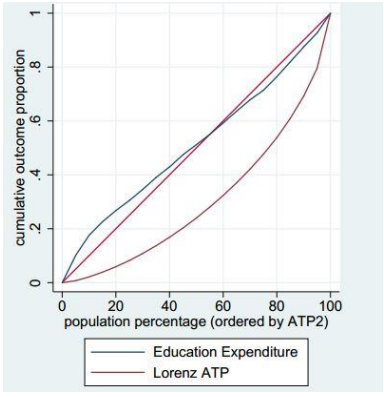
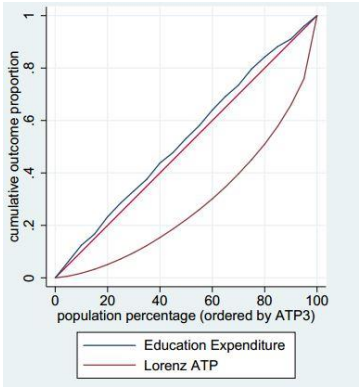


Graph 9: 2012

3) ATP_3; Concentration curve is calculated by $\frac{\text{Household education expenditures}}{\text{ATP3}}$.

Where ATP_3 is estimated by $\frac{\text{Total Income} - \text{Social Transfers}}{\sqrt{\text{number of households}}}$.



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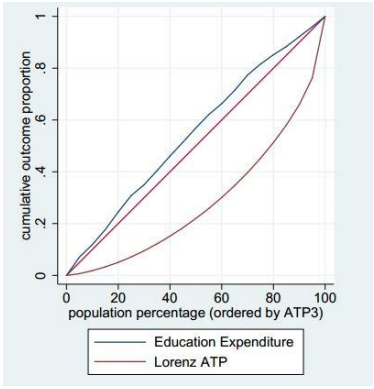

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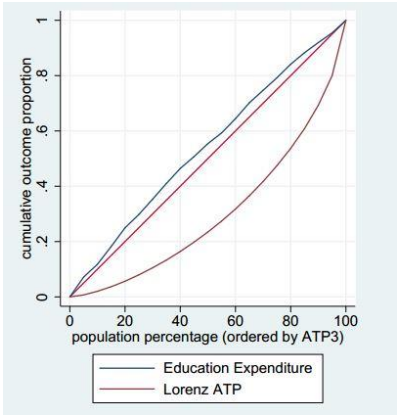

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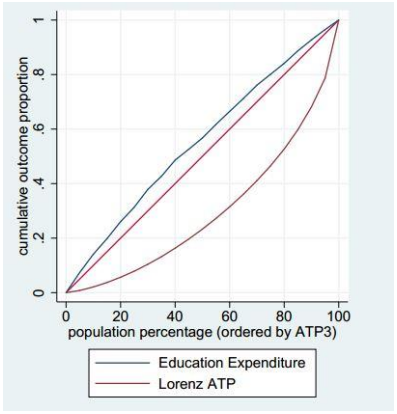

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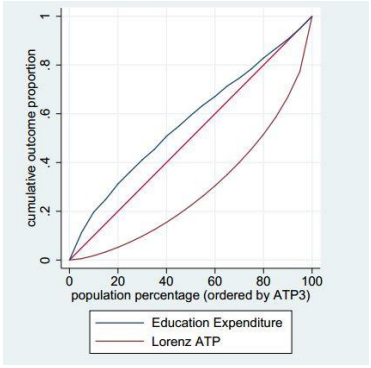

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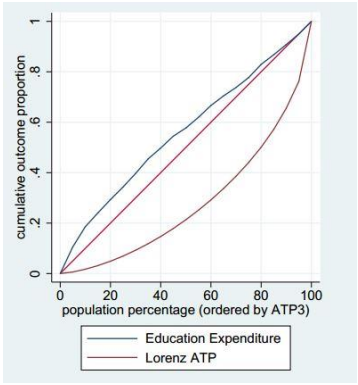

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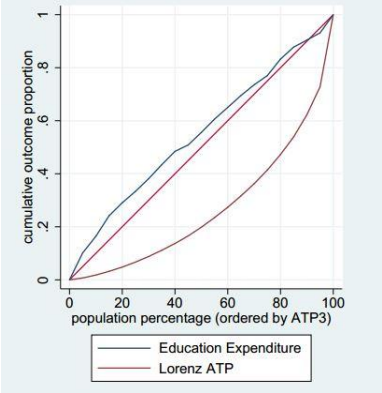

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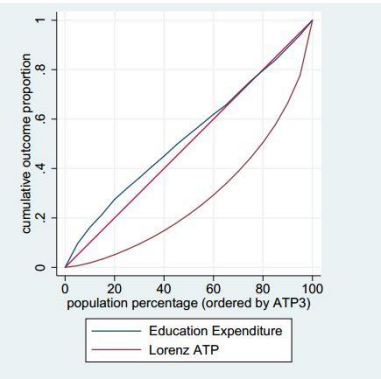

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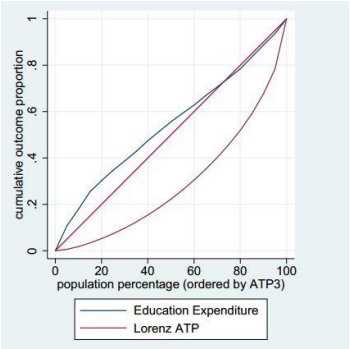
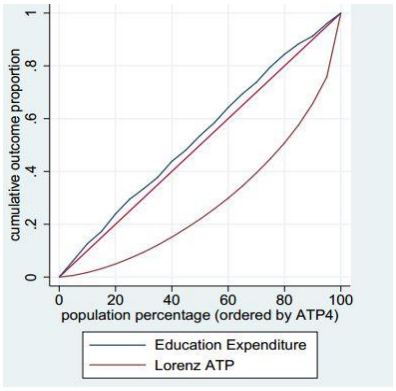


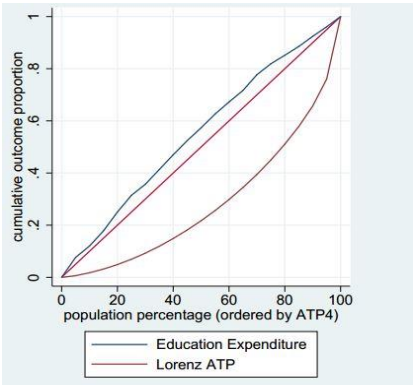
Graph 9: 2012

4) ATP_4; Concentration curve is calculated by $\frac{\text{Household education expenditures}}{\text{ATP4}}$.

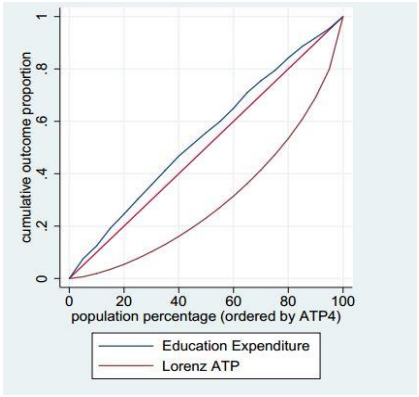
Where ATP_4 is estimated by $\frac{\text{Total Income} - \text{Transfers(Welfare and Social)}}{\sqrt{\text{number of households}}}$.



Graph 1: 2004



Graph 2: 2005



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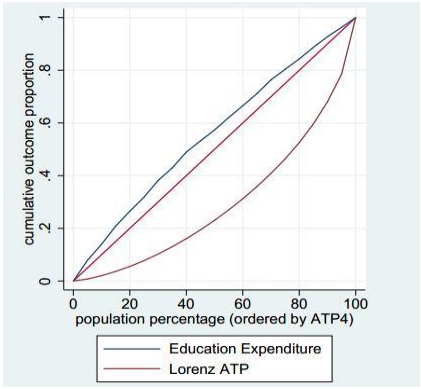

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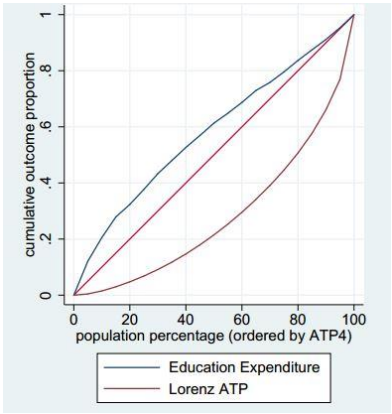
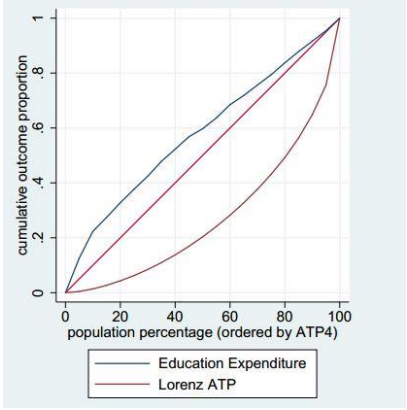


Graph 5: 2008



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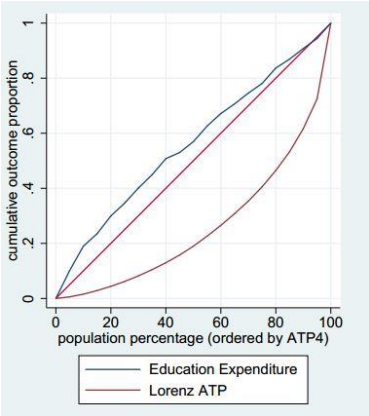
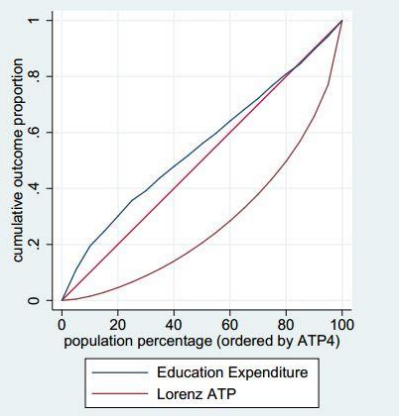
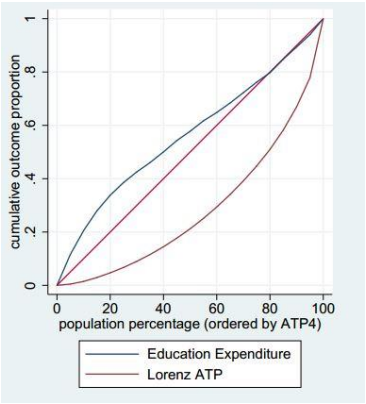


Graph 7: 2010



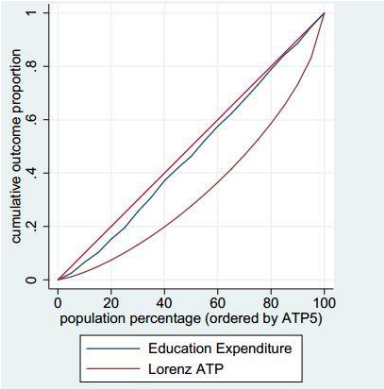
Graph 8: 2011



Graph 9: 2012

5) ATP_5; Concentration curve is calculated by $\frac{\text{Household education expenditures}}{\text{ATP5}}$.

Where ATP_5 is estimated by $\frac{\text{Total Expenditure}}{\sqrt{\text{number of households}}}$.



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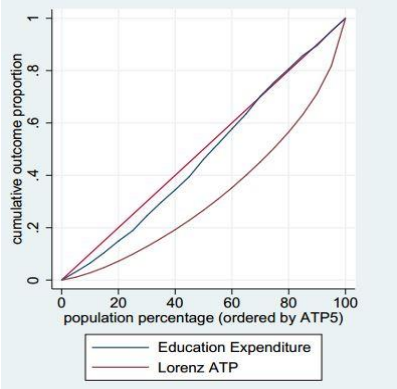

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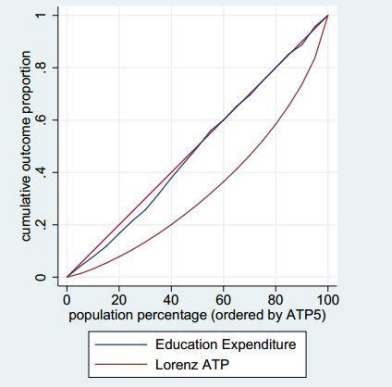

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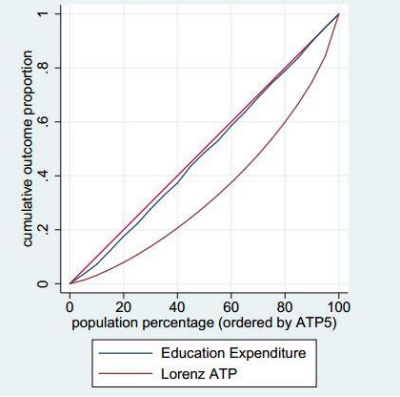
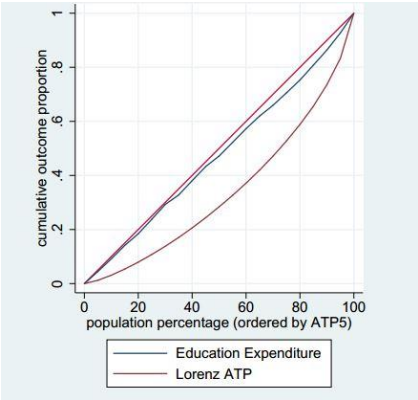
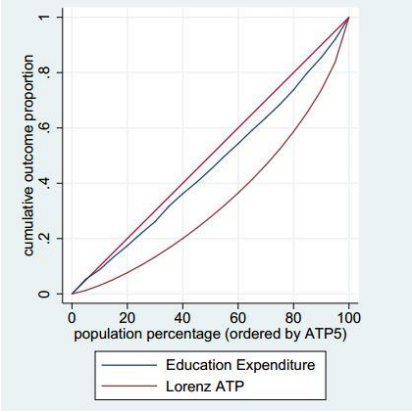


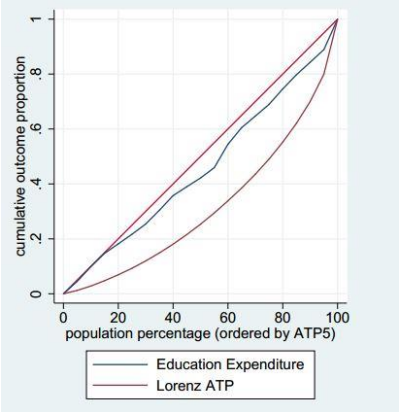
Graph 4: 2007



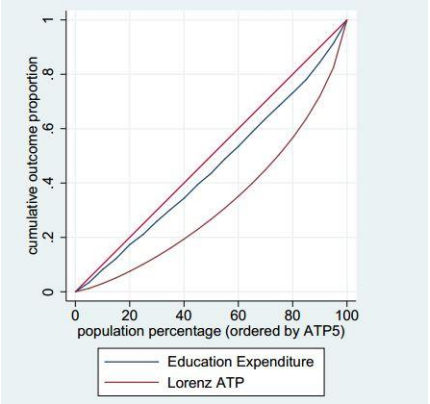
Graph 5: 2008



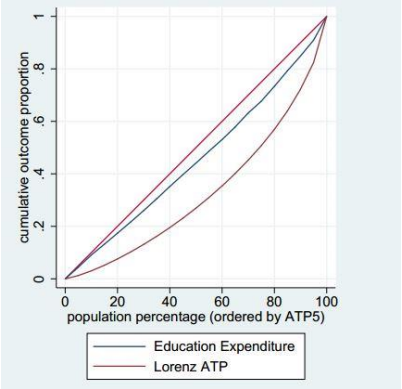
Graph 6: 2009



Graph 7: 2010



Graph 8: 2011



Graph 9: 2012

ATP$_1$

Years	20%	40%	60%	80%	100%	Gini Index	Concentration Index	Kakwani Index
2004	13.87	18.51	18.86	17.71	14.64	0.407	0.010	-0.398
2005	15.25	16.93	17.85	16.04	13.83	0.409	-0.023	-0.432
2006	15.74	20.06	19.12	16.26	15.51	0.377	-0.018	-0.395
A	**14.96**	**18.50**	**18.61**	**16.67**	**14.66**	**0.40**	**-0.01**	**-0.41**
2007	17.53	17.92	16.54	16.63	15.04	0.382	-0.329	-0.711
2008	11.71	10.46	8.67	8.45	10.56	0.392	-0.036	-0.428
2009	10.53	9.41	8.69	9.02	9.32	0.410	-0.025	-0.435
B	**13.25**	**12.59**	**11.30**	**11.37**	**11.64**	**0.39**	**-0.13**	**-0.52**
2010	10.04	7.88	7.07	9.81	8.90	0.437	-0.004	-0.441
2011	9.32	8.35	7.83	8.59	10.50	0.401	0.025	-0.376
2012	10.90	8.34	8.32	8.83	11.80	0.384	0.019	-0.365
C	**10.09**	**8.19**	**7.74**	**9.08**	**10.40**	**0.41**	**0.01**	**-0.39**

ATP$_2$

Years	20%	40%	60%	80%	100%	Gini Index	Concentration Index	Kakwani Index
2004	14.33	18.23	19.45	17.77	14.60	0.410	0.006	-0.404
2005	15.98	17.71	17.77	15.88	14.07	0.412	-0.031	-0.443
2006	16.79	20.14	19.77	16.07	15.74	0.381	-0.023	-0.404
A	**15.70**	**18.69**	**19.00**	**16.58**	**14.81**	**0.40**	**-0.02**	**-0.42**
2007	17.95	18.58	16.67	16.42	15.30	0.385	-0.036	-0.421
2008	13.36	11.08	9.15	8.36	10.82	0.404	-0.066	-0.470
2009	13.53	9.41	9.44	9.45	9.34	0.423	-0.072	-0.495
B	**14.94**	**13.02**	**11.75**	**11.41**	**11.82**	**0.40**	**-0.06**	**-0.46**
2010	11.23	8.29	7.60	9.96	8.92	0.448	-0.026	-0.474
2011	11.29	8.82	8.18	8.94	10.72	0.412	-0.013	-0.425
2012	13.85	8.39	8.44	8.89	12.22	0.396	-0.027	-0.423
C	**12.12**	**8.50**	**8.07**	**9.26**	**10.62**	**0.42**	**-0.02**	**-0.44**

ATP$_3$

Years	20%	40%	60%	80%	100%	Gini Index	Concentration Index	Kakwani Index
2004	23.02	20.32	19.92	20.00	15.62	0.433	-0.058	-0.491
2005	23.33	20.55	19.26	18.03	14.05	0.433	-0.093	-0.526
2006	25.17	21.75	18.21	19.86	16.08	0.401	-0.079	-0.480
A	**23.84**	**20.87**	**19.13**	**19.30**	**15.25**	**0.42**	**-0.08**	**-0.50**
2007	25.85	22.38	17.80	17.45	15.82	0.409	-0.106	-0.515
2008	19.45	12.18	10.18	9.84	10.67	0.425	-0.136	-0.561
2009	17.10	11.97	8.81	9.53	9.94	0.443	-0.121	-0.564
B	**20.80**	**15.51**	**12.26**	**12.27**	**12.14**	**0.43**	**-0.12**	**-0.55**
2010	15.67	10.64	8.99	9.82	9.11	0.471	-0.102	-0.573

2011	14.85	9.45	9.19	9.57	10.97	0.436	-0.060	-0.496
2012	18.12	10.29	9.20	9.35	12.94	0.422	-0.086	-0.508
C	**16.21**	**10.13**	**9.13**	**9.58**	**11.01**	**0.44**	**-0.08**	**-0.53**

ATP_4

Years	**20%**	**40%**	**60%**	**80%**	**100%**	**Gini Index**	**Concentration Index**	**Kakwani Index**
2004	23.94	19.96	20.37	20.24	15.56	0.436	-0.063	-0.499
2005	24.39	21.40	19.71	17.46	14.45	0.436	-0.101	-0.537
2006	25.60	22.82	18.95	19.93	16.37	0.406	-0.086	-0.492
A	**24.64**	**21.39**	**19.68**	**19.21**	**15.46**	**0.43**	**-0.08**	**-0.51**
2007	26.78	22.75	17.73	17.95	15.93	0.412	-0.110	-0.522
2008	21.52	13.47	10.68	9.96	10.86	0.438	-0.163	-0.601
2009	20.98	12.48	9.79	9.79	10.41	0.457	-0.160	-0.617
B	**23.09**	**16.23**	**12.73**	**12.57**	**12.40**	**0.44**	**-0.14**	**-0.58**
2010	17.55	11.79	9.40	9.60	9.45	0.483	-0.124	-0.607
2011	17.78	10.49	9.56	9.96	11.27	0.450	-0.101	-0.551
2012	21.92	10.54	9.60	9.68	13.14	0.437	-0.126	-0.563
C	**19.08**	**10.94**	**9.52**	**9.74**	**11.28**	**0.46**	**-0.12**	**-0.57**

ATP_5

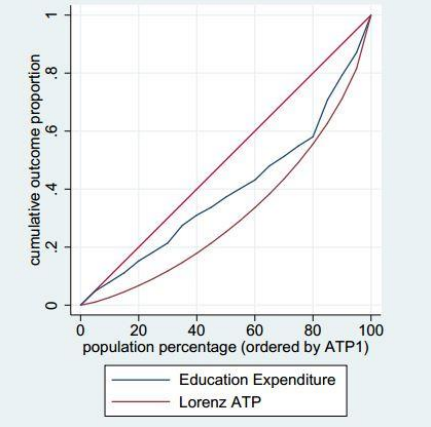
Years	**20%**	**40%**	**60%**	**80%**	**100%**	**Gini Index**	**Concentration Index**	**Kakwani Index**
2004	12.44	17.81	16.52	17.33	17.24	0.336	0.056	-0.280
2005	10.53	13.83	16.47	16.21	13.68	0.355	0.053	-0.302
2006	13.14	16.72	17.39	15.79	15.67	0.333	0.026	-0.308
A	**12.04**	**16.12**	**16.79**	**16.44**	**15.53**	**0.34**	**0.04**	**-0.30**
2007	13.51	15.12	16.28	15.65	16.16	0.319	0.030	-0.289
2008	8.19	8.72	8.55	8.00	10.99	0.327	0.046	-0.281
2009	7.39	8.00	8.27	8.27	11.13	0.333	0.078	-0.255
B	**9.70**	**10.61**	**11.03**	**10.64**	**12.76**	**0.33**	**0.05**	**-0.28**
2010	7.29	7.09	7.55	8.24	10.11	0.374	0.089	-0.285
2011	7.14	7.01	7.83	8.10	11.06	0.352	0.095	-0.257
2012	7.68	7.85	7.88	8.95	11.78	0.348	0.091	-0.257
C	**7.37**	**7.32**	**7.75**	**8.43**	**10.98**	**0.36**	**0.09**	**-0.27**

Distributions of income and burdens of education expenditure presented for different education levels, years and income types.

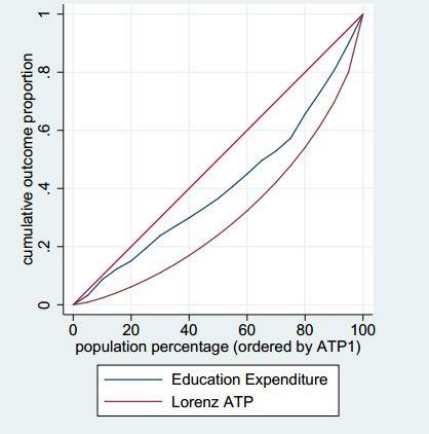
1) **Primary Education, ATP_1**

Concentration curve is calculated by $\frac{\text{Primary education expenditures}}{\text{ATP1}}$.

Where ATP_1 is estimated by $\frac{\text{Total Income}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

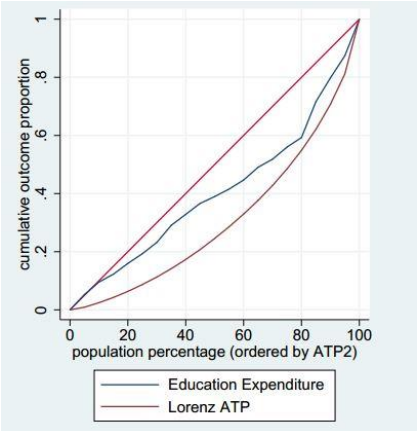


Graph 2: 2012

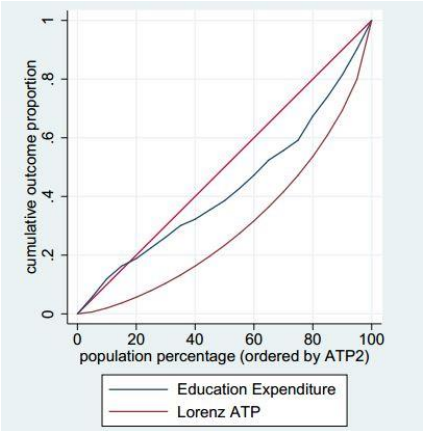
Primary Education, ATP_2

Concentration curve is calculated by $\frac{\text{Primary education expenditures}}{\text{ATP2}}$.

Where ATP_2 is estimated by $\frac{\text{Total Income} - \text{Welfare Transfers}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

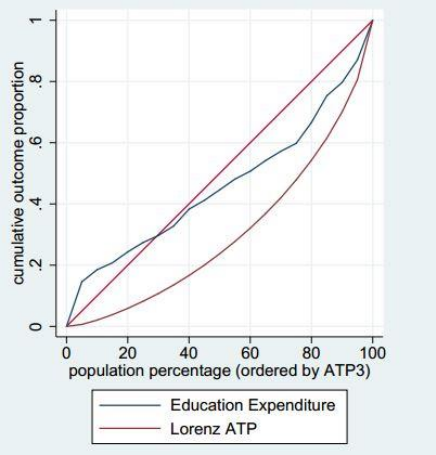


Graph 2: 2012

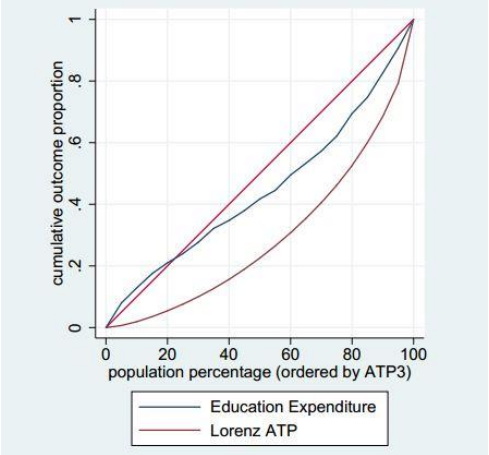
Primary Education, ATP_3

Concentration curve is calculated by $\frac{\text{Primary education expenditures}}{\text{ATP3}}$.

Where ATP_3 is estimated by $\frac{\text{Total Income}-\text{Social Transfers}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

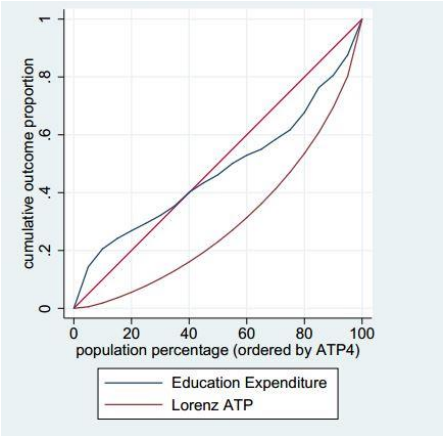


Graph 2: 2012

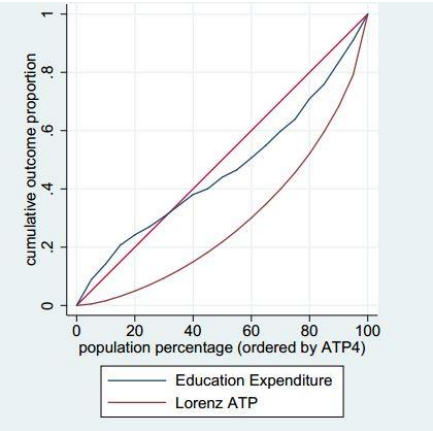
Primary Education, ATP_4

Concentration curve is calculated by $\frac{\text{Primary education expenditures}}{\text{ATP4}}$.

Where ATP_4 is estimated by $\frac{\text{Total Income}-\text{Total Transfers (Social,Welfare)}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

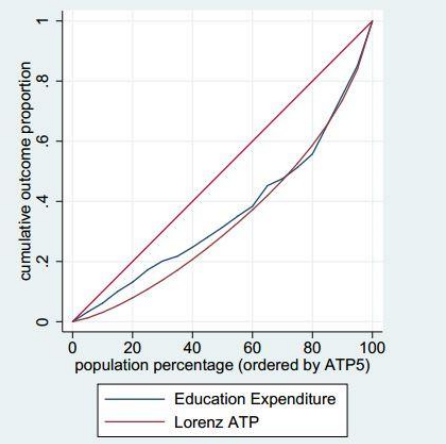


Graph 2: 2012

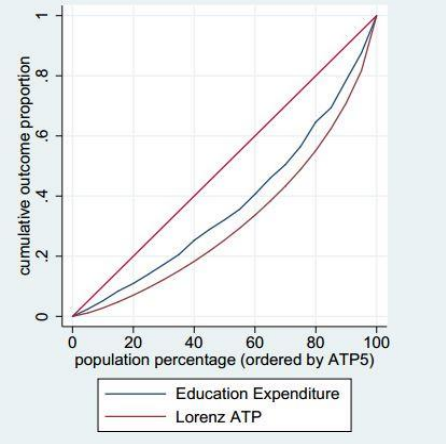
Primary Education, ATP_5

Concentration curve is calculated by $\frac{\text{Primary education expenditures}}{\text{ATP5}}$.

Where ATP_5 is estimated by $\frac{\text{Total Expenditure}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

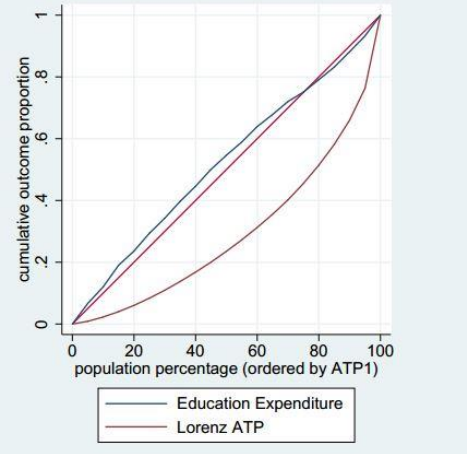


Graph 2: 2012

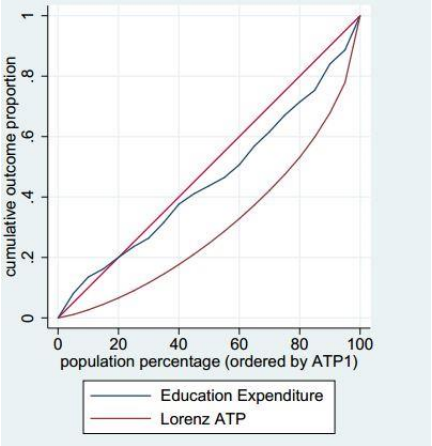
2) Middle School Education, ATP_1

Concentration curve is calculated by $\frac{\text{Middle School education expenditures}}{\text{ATP1}}$.

Where ATP_1 is estimated by $\frac{\text{Total Income}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

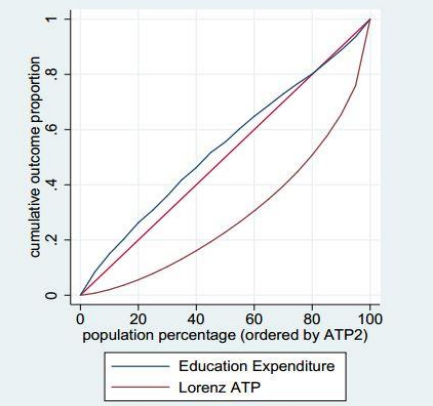


Graph 2: 2012

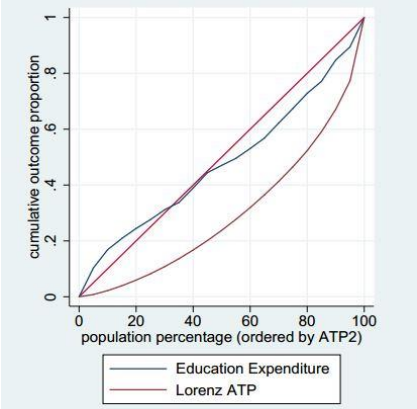
Middle School Education, ATP_2

Concentration curve is calculated by $\frac{\text{Middle School education expenditures}}{\text{ATP2}}$.

Where ATP_2 is estimated by $\frac{\text{Total Income}-\text{Welfare Transfers}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

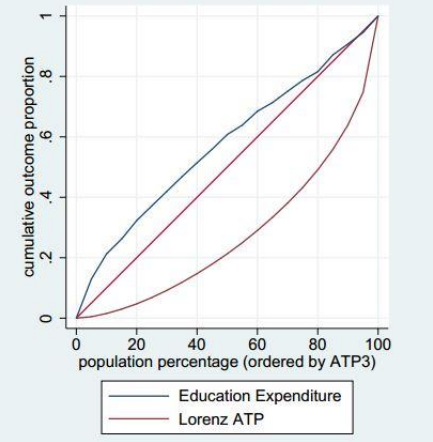


Graph 2: 2012

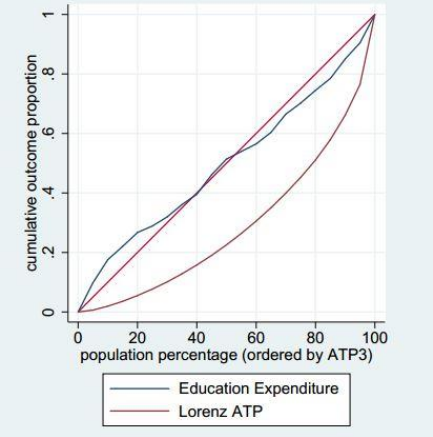
Middle School Education, ATP_3

Concentration curve is calculated by $\frac{\text{Middle School education expenditures}}{\text{ATP3}}$.

Where ATP_3 is estimated by $\frac{\text{Total Income}-\text{Social Transfers}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

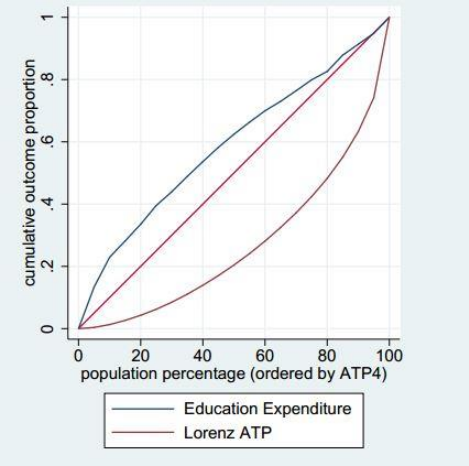


Graph 2: 2012

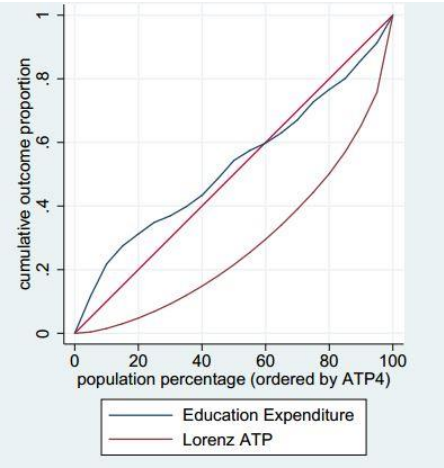
Middle School Education, ATP_4

Concentration curve is calculated by $\frac{\text{Middle School education expenditures}}{\text{ATP4}}$.

Where ATP_4 is estimated by $\frac{\text{Total Income}-\text{Total Transfers (Social,Welfare)}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

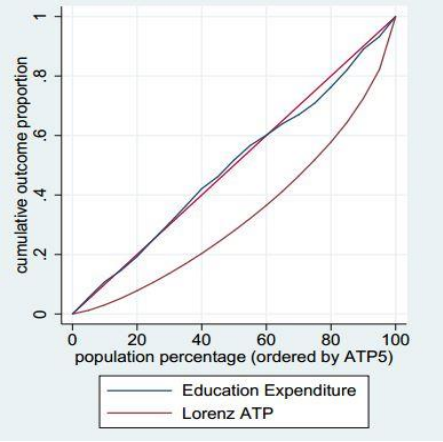


Graph 2: 2012

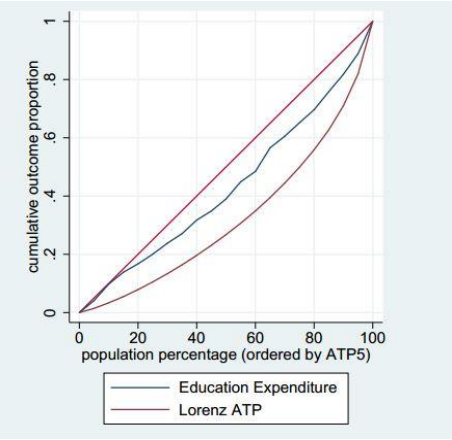
Middle School Education, ATP_5

Concentration curve is calculated by $\frac{\text{Middle School education expenditures}}{\text{ATP5}}$.

Where ATP_5 is estimated by $\frac{\text{Total Expenditure}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

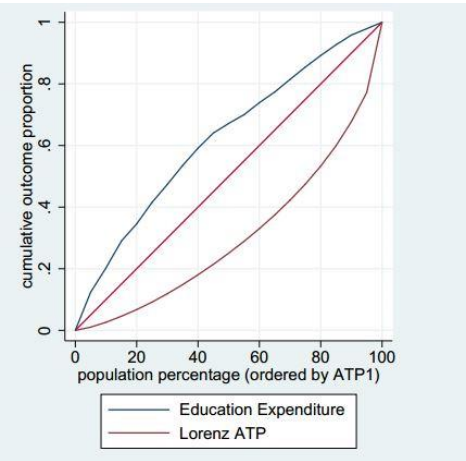


Graph 2: 2012

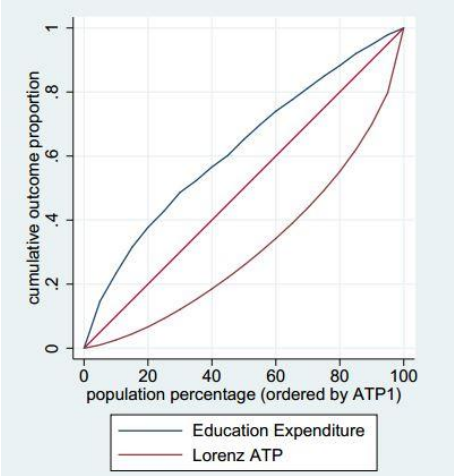
3) High School Education, ATP_1

Concentration curve is calculated by $\frac{\text{High School education expenditures}}{\text{ATP1}}$.

Where ATP_1 is estimated by $\frac{\text{Total Income}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

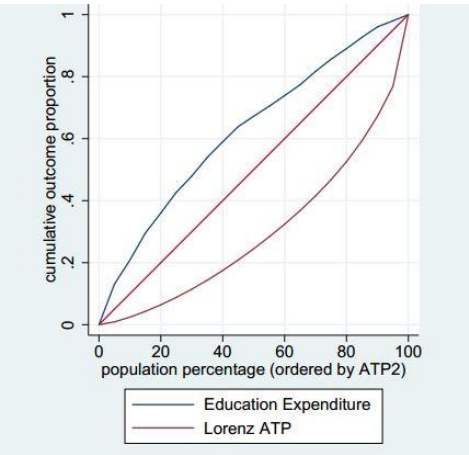


Graph 2: 2012

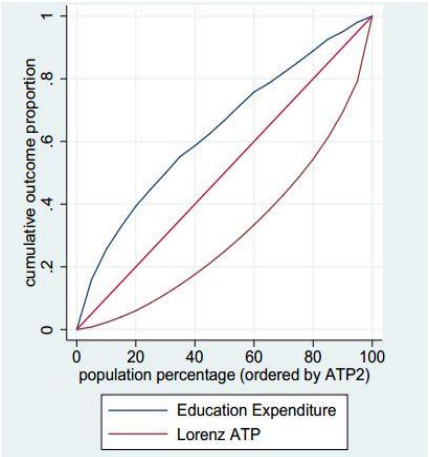
High School Education, ATP_2

Concentration curve is calculated by $\frac{\text{High School education expenditures}}{\text{ATP2}}$.

Where ATP_2 is estimated by $\frac{\text{Total Income} - \text{Welfare Transfers}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

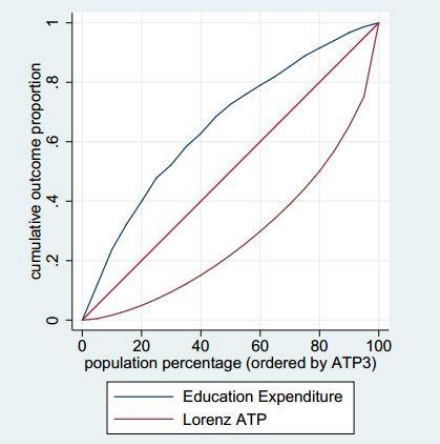


Graph 2: 2012

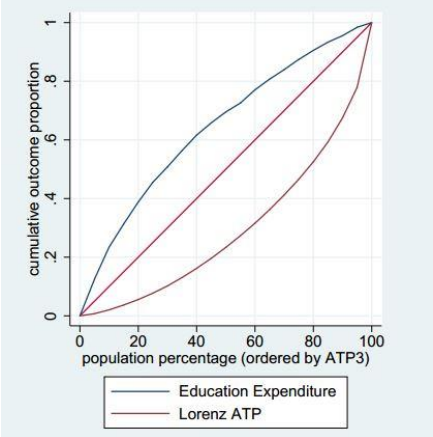
High School Education, ATP_3

Concentration curve is calculated by $\frac{\text{High School education expenditures}}{\text{ATP3}}$.

Where ATP_3 is estimated by $\frac{\text{Total Income}-\text{Social Transfers}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

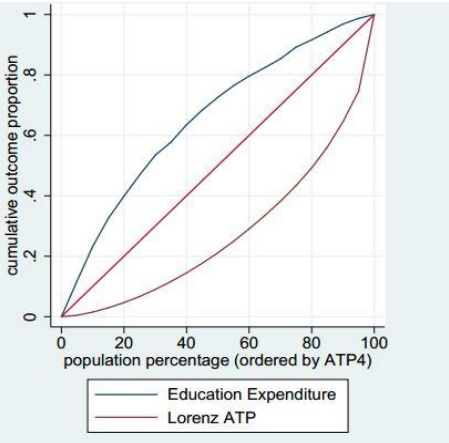


Graph 2: 2012

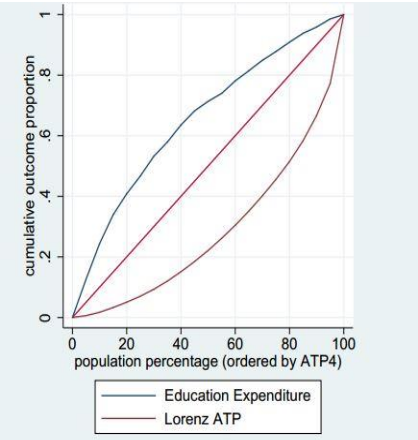
High School Education, ATP_4

Concentration curve is calculated by $\frac{\text{High School education expenditures}}{\text{ATP4}}$.

Where ATP_4 is estimated by $\frac{\text{Total Income}-\text{Total Transfers (Social,Welfare)}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

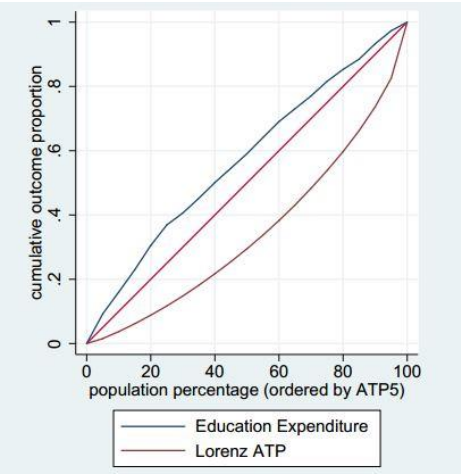


Graph 2: 2012

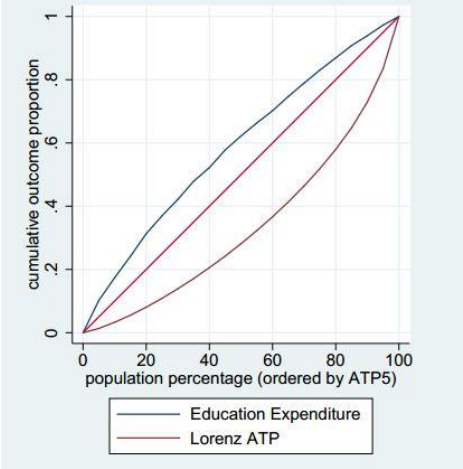
High School Education, ATP_5

Concentration curve is calculated by $\frac{\text{High School education expenditures}}{\text{ATP5}}$.

Where ATP_5 is estimated by $\frac{\text{Total Expenditure}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

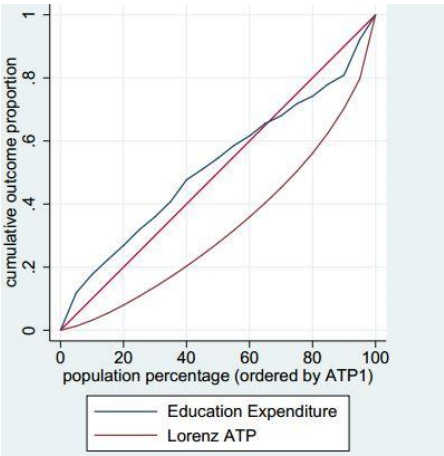


Graph 2: 2012

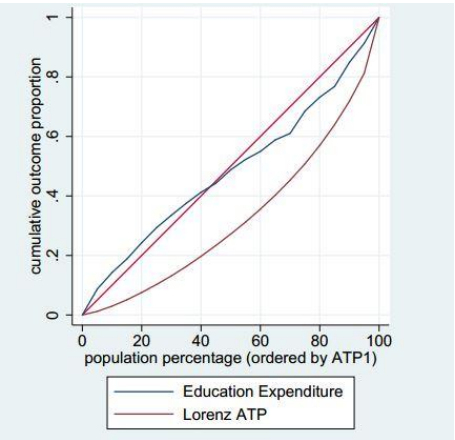
4) Tertiary Education, ATP_1

Concentration curve is calculated by $\frac{\text{Tertiary education expenditures}}{\text{ATP1}}$.

Where ATP_1 is estimated by $\frac{\text{Total Income}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

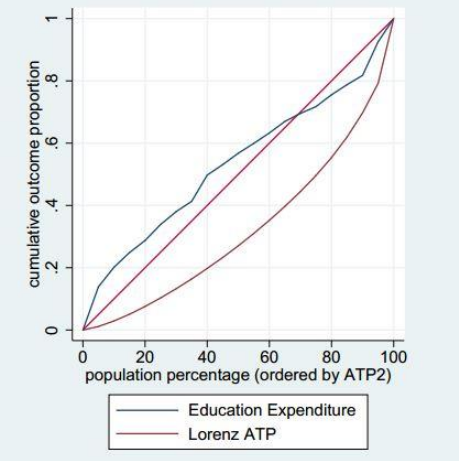


Graph 2: 2012

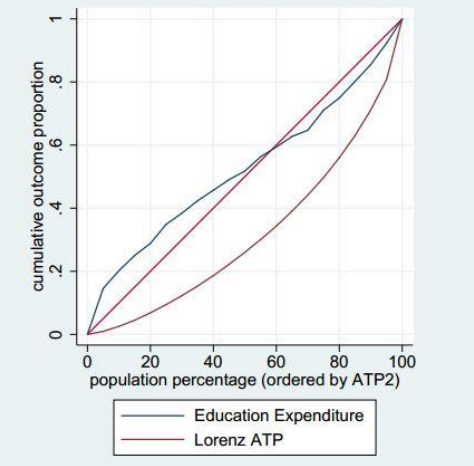
Tertiary Education, ATP_2

Concentration curve is calculated by $\frac{\text{Tertiary education expenditures}}{\text{ATP2}}$.

Where ATP_2 is estimated by $\frac{\text{Total Income}-\text{Welfare Transfers}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

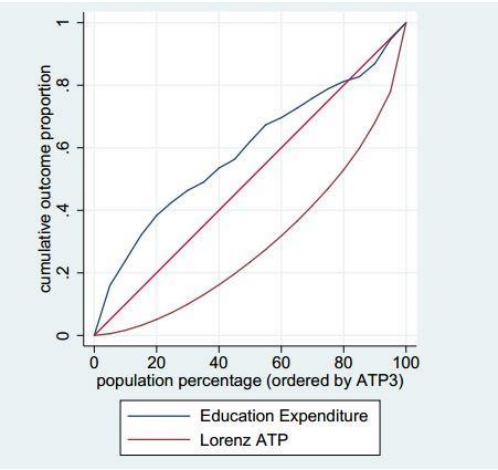


Graph 2: 2012

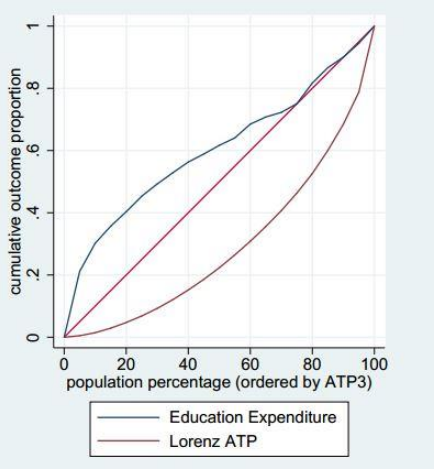
Tertiary Education, ATP_3

Concentration curve is calculated by $\frac{\text{Tertiary education expenditures}}{\text{ATP3}}$.

Where ATP_3 is estimated by $\frac{\text{Total Income}-\text{Social Transfers}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

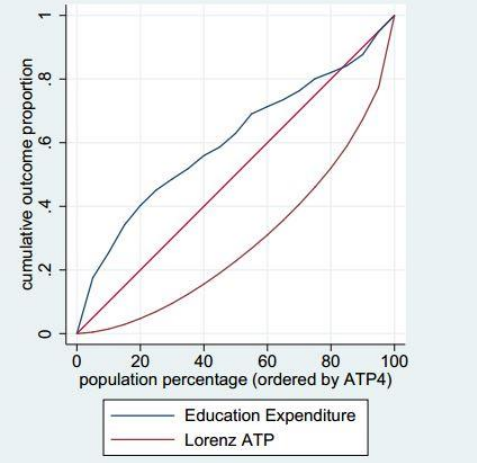


Graph 2: 2012

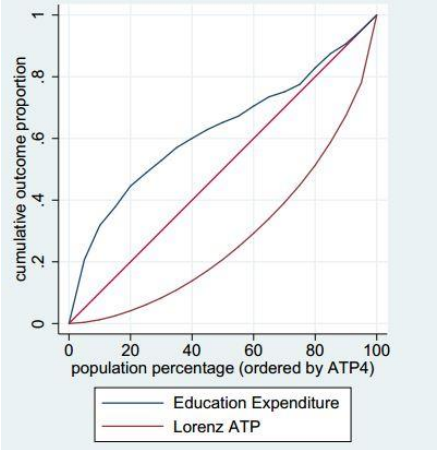
Tertiary Education, ATP_4

Concentration curve is calculated by $\frac{\text{Tertiary education expenditures}}{\text{ATP4}}$.

Where ATP_4 is estimated by $\frac{\text{Total Income}-\text{Total Transfers (Social,Welfare)}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008

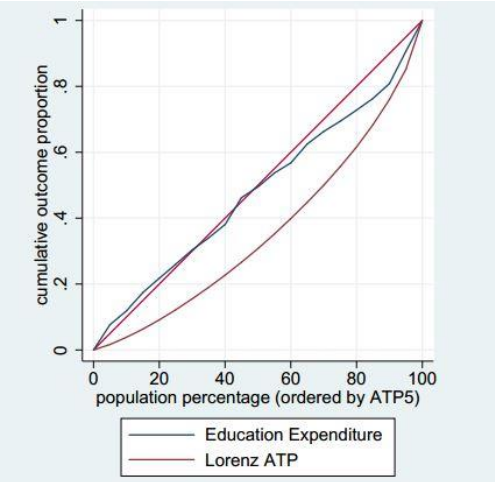


Graph 2: 2012

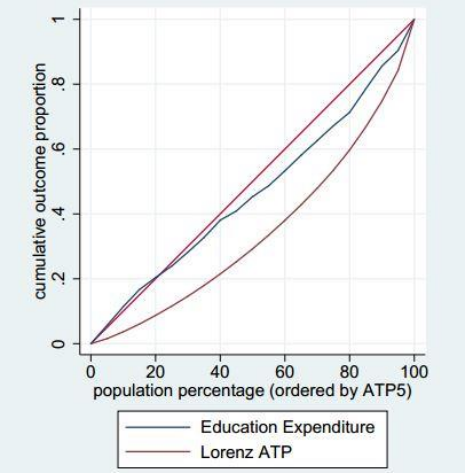
Tertiary Education, ATP_5

Concentration curve is calculated by $\frac{\text{Tertiary education expenditures}}{\text{ATP5}}$.

Where ATP_5 is estimated by $\frac{\text{Total Expenditure}}{\sqrt{\text{number of households}}}$.



Graph 1: 2008



Graph 2: 2012

ATP_1

Years	20%	40%	60%	80%	100%	Gini Index	Concentration Index	Kakwani Index
Primary	1.81	1.58	2.15	1.91	3.72	0.40	0.16	-0.24
2004	2.76	2.07	3.79	2.78	3.97	0.413	0.087	-0.326
2008	0.91	0.98	0.77	0.80	2.52	0.394	0.210	-0.184
2012	1.77	1.70	1.89	2.15	4.67	0.386	0.188	-0.198
Mid. School	1.82	2.33	2.42	2.40	2.70	0.40	0.02	-0.38
2004	1.84	3.84	3.42	3.43	2.83	0.413	0.018	-0.395
2008	2.43	2.15	2.69	2.16	3.29	0.394	-0.045	-0.439
2012	1.20	0.99	1.15	1.61	1.98	0.386	0.088	-0.298
High School	4.49	4.63	4.59	3.79	2.45	0.40	-0.22	-0.62
2004	5.18	7.97	8.14	6.86	3.77	0.413	-0.176	-0.589
2008	4.15	3.64	3.02	2.62	2.09	0.394	-0.244	-0.638
2012	4.14	2.27	2.62	1.91	1.50	0.386	-0.245	-0.631
Tertiary	0.89	1.00	1.36	1.26	2.23	0.40	-0.03	-0.42
2004	0.71	1.09	1.20	1.18	2.18	0.413	-0.061	-0.474
2008	0.79	0.61	1.37	1.07	1.75	0.394	-0.043	-0.437
2012	1.17	1.32	1.51	1.52	2.76	0.386	0.025	-0.361

ATP_2

Years	20%	40%	60%	80%	100%	Gini Index	Concentration Index	Kakwani Index
Primary	2.00	1.63	2.12	1.97	3.78	0.41	0.14	-0.27
2004	2.76	2.08	3.83	2.75	4.01	0.416	0.086	-0.330
2008	0.91	1.13	0.74	0.83	2.56	0.408	0.188	-0.220
2012	2.33	1.66	1.79	2.33	4.77	0.402	0.143	-0.259
Mid. School	2.33	2.19	2.45	2.51	2.70	0.41	-0.01	-0.42
2004	2.76	3.26	3.39	3.44	2.83	0.416	0.002	-0.414
2008	2.66	2.37	2.75	2.37	3.24	0.408	-0.073	-0.481
2012	1.56	0.93	1.21	1.71	2.02	0.402	0.037	-0.365
High School	4.69	4.88	4.50	4.01	2.49	0.41	-0.23	-0.64
2004	5.44	8.24	7.77	7.07	3.77	0.416	-0.180	-0.596
2008	3.81	4.04	3.27	2.77	2.21	0.408	-0.249	-0.657
2012	4.84	2.38	2.46	2.18	1.50	0.402	-0.270	-0.672
Tertiary	1.15	1.10	1.40	1.48	2.21	0.41	-0.28	-0.69
2004	0.71	1.10	1.39	1.60	2.18	0.416	-0.066	-0.482
2008	0.86	0.79	1.42	1.11	1.70	0.408	-0.732	-1.140
2012	1.88	1.41	1.39	1.74	2.76	0.402	-0.051	-0.453

ATP_3

Years	20%	40%	60%	80%	100%	Gini Index	Concentration Index	Kakwani Index
Primary	2.25	1.87	2.12	2.23	4.15	0.45	0.08	-0.38
2004	3.10	2.66	3.55	3.27	4.63	0.472	0.039	-0.433
2008	1.38	0.92	1.14	0.97	2.62	0.444	0.077	-0.367
2012	2.27	2.04	1.68	2.46	5.19	0.434	0.109	-0.325
Mid. School	3.10	2.84	2.82	2.74	2.85	0.45	-0.08	-0.53
2004	3.89	4.78	3.43	4.03	2.96	0.472	-0.097	-0.569
2008	3.68	2.75	3.33	2.61	3.45	0.444	-0.151	-0.595
2012	1.72	0.98	1.71	1.59	2.15	0.434	0.004	-0.430
High School	5.78	6.32	5.60	5.09	2.36	0.45	-0.28	-0.73
2004	6.54	10.41	9.46	9.13	3.67	0.472	-0.232	-0.704
2008	5.85	4.98	4.19	3.01	2.03	0.444	-0.312	-0.756
2012	4.94	3.57	3.14	3.14	1.39	0.434	-0.285	-0.719
Tertiary	2.52	1.85	1.53	1.81	2.15	0.45	-0.19	-0.64
2004	0.80	2.38	2.05	2.08	1.60	0.472	-0.179	-0.651
2008	2.22	1.28	1.05	1.71	1.70	0.444	-0.183	-0.627
2012	4.54	1.89	1.49	1.63	3.16	0.434	-0.207	-0.641

ATP_4

Years	20%	40%	60%	80%	100%	Gini Index	Concentration Index	Kakwani Index
Primary	2.46	2.27	2.73	2.51	4.00	0.47	0.04	-0.43
2004	2.95	2.87	3.52	3.29	4.64	0.477	0.038	-0.439
2008	1.49	1.06	1.16	0.94	2.73	0.453	0.043	-0.410
2012	2.95	2.87	3.52	3.29	4.64	0.477	0.038	-0.439
Mid. School	3.66	2.91	2.80	2.77	2.93	0.46	-0.11	-0.57
2004	4.49	4.57	3.31	4.14	2.97	0.477	-0.107	-0.584
2008	4.25	3.04	3.43	2.60	3.54	0.453	-0.179	-0.632
2012	2.25	1.14	1.66	1.59	2.27	0.448	-0.054	-0.502
High School	5.82	6.67	5.83	5.20	2.38	0.46	-0.29	-0.74
2004	6.62	10.31	9.77	9.23	3.67	0.477	-0.232	-0.709
2008	5.62	5.42	4.56	3.23	2.10	0.453	-0.315	-0.768
2012	5.23	4.26	3.15	3.15	1.38	0.448	-0.310	-0.758
Tertiary	2.89	2.12	1.61	1.78	2.18	0.46	-0.22	-0.68
2004	0.89	2.31	2.24	2.00	1.61	0.477	-0.185	-0.662
2008	2.43	1.46	1.18	1.71	1.74	0.453	-0.211	-0.664
2012	5.37	2.59	1.42	1.64	3.19	0.448	-0.255	-0.703

ATP_5

Years	20%	40%	60%	80%	100%	Gini Index	Concentration Index	Kakwani Index
Primary	1.51	1.60	1.43	2.25	3.56	0.34	0.22	-0.12
2004	2.59	2.86	1.98	3.53	3.95	0.346	0.136	-0.210
2008	0.72	0.58	0.85	0.85	2.38	0.327	0.278	-0.049
2012	1.23	1.36	1.46	2.37	4.36	0.348	0.254	-0.094
Mid. School	1.71	2.32	2.27	2.27	2.56	0.34	0.07	-0.27
2004	2.31	3.42	3.25	3.35	2.57	0.346	0.069	-0.277
2008	1.82	2.67	2.37	2.06	3.14	0.327	0.011	-0.317
2012	1.02	0.88	1.19	1.41	1.98	0.348	0.137	-0.211
High School	3.90	4.32	4.30	3.42	2.14	0.34	-0.15	-0.49
2004	5.92	7.53	7.98	6.33	2.99	0.346	-0.144	-0.490
2008	2.86	3.07	2.68	2.58	2.08	0.327	-0.145	-0.472
2012	2.91	2.36	2.24	1.34	1.34	0.348	-0.173	-0.521
Tertiary	0.67	0.90	1.18	1.75	2.21	0.34	0.03	-0.31
2004	0.47	0.79	1.11	1.52	2.40	0.346	-0.034	-0.380
2008	0.52	0.71	0.92	1.19	1.69	0.327	0.040	-0.287
2012	1.03	1.19	1.53	2.54	2.54	0.348	0.070	-0.278