IJCEAS

International Journal of Contemporary Economics and Administrative Sciences
ISSN: 1925 – 4423
Volume: XIV, Issue: 2, Year: 2024, pp.567-587

Equity in Education Financing: The Case of Turkey

Elene MURVANIDZE [1]

Received: 10.04.2022, Accepted: 11.12.2024
DOI Number: 10.5281/zenodo.14553041

Abstract

This study investigates the burden of out-of-pocket education expenditures on households in Turkey. To measure equity in education financing we follow a conceptual framework outlined by UNESCO (2018) and utilize approaches previously used in assessing health equity. Following Wagstaff et al.'s (2008) approach, we first calculate education expenditure as a share of Ability-to-Pay (ATP) and then utilize the Lorenz dominance analysis to compare the distribution of these education expenditures with the distribution of income. Lastly, we calculate Kakwani indices and measure the magnitude of progressivity. The results indicate that from 2004 to 2012, education expenditures as a share of three different proxies of the standard of living (disposable income, market income, and total expenditure) increased for every income quintile. Based on the Lorenz dominance analyses, the low-income group's share of income is often lower than its share of education expenditures – suggesting regressive education financing. Comparing expenditure by levels of education shows that primary education financing is progressive, whereas tertiary education financing is regressive. The results indicate that the provision of education policies in and of itself is not sufficient for attaining a more equitable education system.

Key words: Education Expenditures, Educational Equity, Lorenz Curve, Concentration Indices, Turkey

JEL Code: I20, I21, I22

1. Introduction

Education is often viewed as a tool for social change and a way out of poverty. School curricula spread social mores, ideologies, and languages; literacy and numeracy facilitate social and economic transactions and benefit individuals and societies at large. Investments in education increase lifetime earnings and positively impact human skills and worker productivity. The benefits of education thus are vast and complex. Nevertheless, around 260 million children were out of school in 2018 – nearly one-fifth of the global population in that age group (UN, 2020). Ensuring no one is left behind in educational access and learning is a major

[1] Colorado State University, USA, elene.murvanidze@csu.edu

priority of Sustainable Development Goal (SDG 4) and the UN through this goal urges all countries to provide access to complete free, equitable, and quality primary and secondary education by 2030.

Equitable education encompasses ideas of justice and fairness and requires that education systems be fair and inclusive in their design and practices, where personal and social circumstances (gender, socio-economic status, ethnic origin) do not restrict individuals from achieving their educational potential (Simon et al, 2007). Governments recognize the need to develop equitable education systems but often lack actions guaranteeing progress towards achieving this goal. When governments fail to implement equitable education policies, education becomes another source of social differentiation. Furthermore, public expenditure on schooling can harm the poor if the poor have limited (or no) access to public education yet finance it via taxes (Duman, 2008).

Psacharopoulos (1986) argues that inefficiencies in educational policies are mainly due to: (1) underinvestment in education, (2) misallocation of resources among schooling levels, (3) inefficient use of resources within individual schools, and (4) inequality in the distribution of educational costs and benefits among various income groups. Moreover, the 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 have strong repercussions on the differences in education quality (Bonal, 2007).

These potential causes of inefficiencies in educational policies can be observed in the Turkish education system. Over the last 20 years, the government has initiated various education reforms, however, the public expenditure on education as a share of GDP has stayed low (3.32% in 2020). In addition, public expenditure has become biased towards tertiary education as higher amounts are spent on tertiary education while expenditure on primary and secondary education are significantly below the OECD averages. The low public expenditure on education has been accompanied by increased private spending (1.2% of GDP in 2017). The largest portion of private education expenditure is on private tutoring services. Since 2002 the number of private schools and private preparatory institutions has sharply increased. In the 2013-2014 academic year, about 1.2 million students were enrolled in 3,579 private tutoring schools. Following Psacharopoulous' (1986) arguments, one might conclude that education policies in Turkey are likely to be inefficient, though public opinions have highly diverged in this regard. Some claim that implemented reforms result in a more inclusive and diverse education system, while others argue that the reforms fail to make education more accessible for disadvantaged students.

In this paper, we analyze the burden of out-of-pocket education expenditures across different income quintiles to measure equity in education financing. We follow UNESCO's (2018) recommendation and estimate concentration curves to measure equity in education. We specifically look at education financing and investigate whether it presents a bias against the poor and/or a bias in favor of higher

education. The contribution of this study is threefold: (1) while previous studies have concentrated on analyzing determinants of education expenditures, this paper measures education equity and provides cumulative distribution of education expenditures as a share of total disposable income, total market income, and total expenditure. (2) This study provides analysis of total education expenditures as well as expenditures on each education level. (3) Contrary to other studies, instead of looking at a particular moment in time, the paper looks at a period and analyzes total education expenditures biannually for the 2004-2016 period, and quadrennially for different education levels.

The remainder of the paper is organized as follows: Section 2 provides an overview of public and private education expenditures in Turkey. Section 3 discusses the literature on education equity. Section 4 introduces the data and methodology. Section 5 presents the findings and results. Finally, Section 6 concludes.

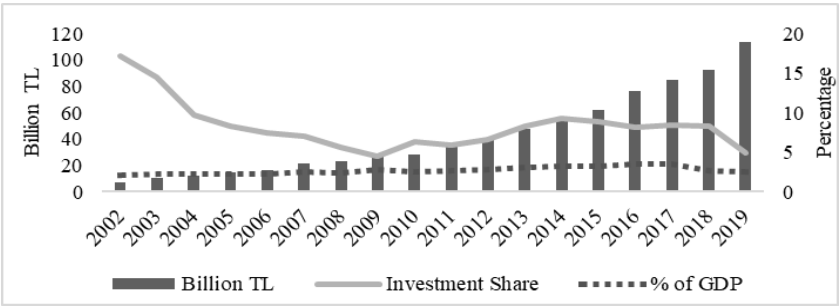
2. Overview of Education Expenditures in Turkey

2.1. Private and Public Spending on Education

Although the government of Turkey has implemented many education reforms, the public expenditure on education as a share of GDP has stayed low. The budget of the Ministry of National Education (MoNE) and Council of Higher Education increased sixteen-fold, from about 10 billion Turkish liras (TL) in 2002 to 161.5 billion in 2020, however, it only grew by 0.5% as a share of GDP (MoNE, 2020).

The largest share of MoNE's expenditure, around 70%, has been spent on the salaries of teachers and other personnel. As Figure 1 shows, the share allocated to education investments declined from 17.18% (2002) to 4.57% (2009). In 2012, after the passage of the "4+4+4 Education Law", the education investment increased to 8.86%, but by 2019 it dropped back to 4.88%.

Figure 1. Budget of Ministry of Education of Turkey



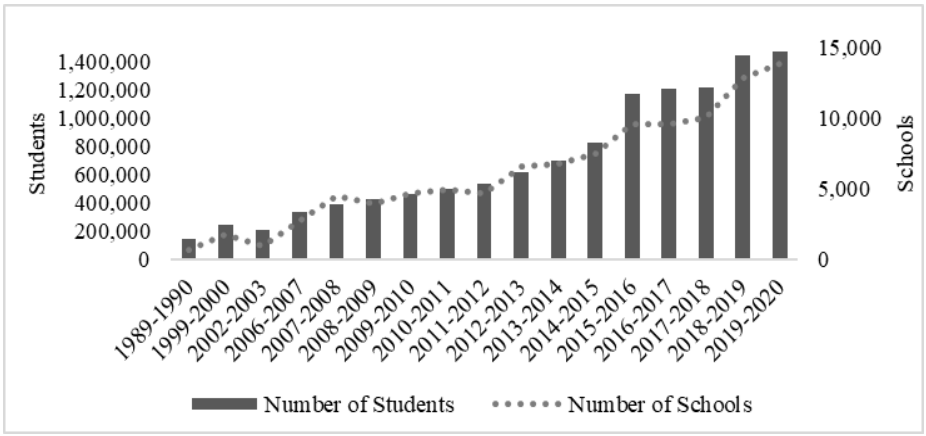
Source: MoNE (2020)

Turkey has one of the lowest annual public expenditures per student compared to other OECD countries. With a total expenditure of USD 5,586 per student (primary to tertiary level), Turkey ranked 34th out of 36 OECD and partner countries in 2017 (OECD, 2020). The amounts spent on tertiary education are relatively high, while expenditure on primary and secondary education are significantly below the OECD averages. The declining public resources and lower quality of education at public schools have led to an explosive increase in the number of private schools and private tutoring institutions (Tansel and Bircan, 2006).

> Private sources accounted for 25% of total spending on primary, secondary, and postsecondary non-tertiary educational institutions, more than twice the OECD average of 10%. In contrast, at tertiary level, private sources account for a smaller share in Turkey (25%) than on average across OECD countries (32%).
>
> (OECD 2019, p. 3)

The largest portions of private expenditures are allocated to private tutoring services, preparing students for secondary school and university entrance examinations. Since 2002, the number of students attending private preparatory institutions more than doubled (1.2 million students were enrolled in private preparatory institutions in 2011 and 2012) (MoNE 2020; Ural 2012). Figure 2 shows a sharp increase in the number of private schools and the number of students enrolled in private schools. According to Aksit (2016), public schools are believed to provide insufficient education and are overcrowded. The average size in private school classrooms is 20-25 students, whereas, in public schools, the average classroom size equals 60-70 students.

Figure 2. Private education in Turkey. Number of private schools and number of students enrolled in private schools.



Source: 1989-2003 – İnal and Akkaymak (2012), 2006-2020 – MoNE (2020)

2.2. Key Education Reforms (2002-2016)

2.2.1. The Conditional Cash Transfers for Education (CCTE) program

After the economic crisis of 2001, the World Bank and the government of Turkey signed the loan agreement to start the Conditional Cash Transfers for Education (CCTE) program with the implementation of the Social Risk Mitigation Project (SRMP). Originally the CCTE program aimed to help the poorest 6% of the population, but later it was extended to the poorest 12%. As of 2012, more than two million people were benefiting from the CCTE transfers.

Inadequate amounts of transfers, exclusion of many children and families who are in fact in need of assistance, and irregularity of payments are the key challenges of the CCTE program in Turkey (UNICEF 2014). Many CCTE recipients do not know why they receive these transfers, some think that the transfers are distributed by municipalities, while others think that the CCTE transfers simply are a charity (Ministry of Family and Social Policy, 2012). 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) (Şener, 2016).

2.2.2. The FATİH Project

FATİH project was launched in 2011 and is valued at USD 8 billion of the national budget (Tolu, 2014). Its goal is to enhance the technological infrastructure of classrooms and provide all students with a tablet computer (distributing 14 million tablets and 570,000 interactive whiteboards to students and teachers) (Tolu, 2014). The project has been heavily criticized in Turkey and in other countries where similar "1-to-1 computing" projects have been implemented (Cristia et al., 2017). Opponents of the project emphasize that there are more urgent issues that need addressing, including overcrowded classrooms, insufficient school facilities, poor in-service training, paid, contract and substitute supply teachers, and old curricula.

2.2.3. "4+4+4 Law"

In 2012, the government proposed legislation dividing the eight-year primary education into two stages each lasting four years. Formerly, children had to be 6-year-old (72 months) to start their education. The new law decreased the requirement to 5 years (60 months), and as a result, required schools to host two times more students than before. Additionally, the law allowed distance education and apprenticeship training starting from the age of 10. Critics argue that at the age of 9-10 children are very young for vocational guidance (Gün and Baskan, 2014). Furthermore, the transition to middle school, and selection of fields of specialization at the end of the fourth grade might hurt the less privileged children,

children from poor families and children who only know the Kurdish language when they enter the first grade, as these children may not be able to overcome their handicap by the end of the fourth grade.

3. Literature Review

A substantial number of empirical studies have measured economic and social returns to education. Education positively impacts economic growth (Krueger and Lindahl, 2001), technological innovation, (Lucas 1988; Romer 1990; Aghion et al 1998) individual earnings, (Ashenfelter and Krueger, 1994; Duflo, 2001; Patrinos, 2016) and standards of living. Besides the economic benefits, education lowers child mortality (Gakidou, 2010; Makate and Makate, 2016), improves adult health (Adams, 2002; Silles 2009), and increases life expectancy (Lleras-Muney, 2005). Improvements in education are often viewed as a principal tool for reducing and eradicating poverty. According to Sylwester (2002), countries with higher expenditures on education have lower levels of income inequality.

Governments have been the main providers of education at primary and secondary school levels and in many countries, they also have been subsidizing tertiary education. Hence, there is often an assumption that governments pay for education. The findings presented by UNESCO Institute for Statistics (2018), challenge this assumption. In some countries, households contribute 30% or more of the combined household and government funding for primary education resulting in inequities especially in areas with low government investment (UNESCO UIS, 2018). In developing countries, social returns to investment in primary education are 10 percentage points higher than the returns to tertiary education (21.3% vs. 11.3%) (Psacharopoulos and Patrinos, 2004), yet large public funds are often allocated to the education levels that the most vulnerable are least likely to access (UNICEF, 2015).

Several studies have analyzed determinants of out-of-pocket education expenditures in Turkey. Acar et al (2016) use Household Budget Surveys for 2003, 2007, and 2012 and analyze income elasticities for education expenditures. They find that households in Turkey allocate greater shares of their budgets to private schools and private tutoring institutions. They also argue that the burden of education financing in Turkey is disproportionately heavier for poorer households.

Gürler and Demiroglari (2020) estimate determinants of education expenditures using the Tobit model and the 2017 Household Budget Survey. Their findings indicate that the presence of individuals between the ages of 6-14 reduces pre-university and university level expenditures; overall, parents spend the highest amounts on basic education and decrease their spending with every education level.

Caner and Okten (2013) analyze higher education subsidies and utilize the three-stage Heckman model, multinomial probit model, and three-part model. Their analysis of a nationally representative survey of university entrance exam applicants shows that students from higher-income families are more likely to enroll in private universities. However, among the students enrolled in public universities,

higher-income students enter public universities that receive higher subsidies from the government. Özdemir (2016) derives similar conclusions using the PISA 2012 sample for Turkey. Özdemir (2016) finds the association of PISA 2012 math performance to be strongest with school type and argues that socio-economically advantaged students are segregated into particular types of schools with better resources and superior conditions.

Mercan and Sezer (2014) analyze the relationship between education expenditures and economic growth for Turkey in the 1980-2012 period. Using time series data and a bounds test approach, they find a positive and significant relationship between education expenditures and economic growth. Patrinos, Psacharopoulos and Tansel (2021) use the full discounting method and specifically estimate private and social returns to education. They look at the 2017 Household Labor Force Survey and use the number of children under 15 years of age living in the household as an exclusion restriction in their statistical analysis. The results of their study show that the average rate of return to schooling is higher in the public sector compared to the private sector (7.9% vs. 6.5%). They also find that private and social returns are highest at the tertiary level and highlight the need for further expansion of higher education.

The previous studies analyzing out-of-pocket expenditures in Turkey have focused on estimating the determinants of education expenditures. In this paper, we specifically estimate equity in education financing. To our knowledge, no other study has measured education equity and education expenditures by education level in Turkey.

4. Data and Methodology

For the methodology, we follow a conceptual framework for measuring equity outlined by UNESCO (2018) and utilize approaches previously used in assessing health equity. Specifically, we utilize Wagstaff et al.'s (2007) approach outlined in "Analyzing Health Equity Using Household Survey Data" published by World Bank Institute and aim to assess the degree of proportionality between expenditures on education and standard of living. In microeconomics literature, income, expenditure, and consumption have been used as direct measures of standards of living. The choice of the measure is often based on the data availability, and in some cases, this choice may affect the findings and conclusions as the reported income often falls short of reported consumption (Wagstaff et al., 2007; Meyer and Sullivan, 2003). For developing countries, consumption and expenditure are considered as preferred measures of welfare (Deaton and Grosh, 2000; Meyer and Sullivan, 2011). The main reason they are preferred to income is that measurement error in consumption is less pronounced for low-income groups than the measurement error in income (Meyer and Sullivan, 2003). In this paper, we use both and analyze education expenditures as a share of total income and total expenditure.

To evaluate the equity of the education financing we use Household Income and Consumption Expenditures Surveys (HICES) collected by the Turkish Statistical Institute (TurkStat) during the 2004-2016 period. HICES covers the whole country, is nationally representative, and has been carried out regularly since 2002. The survey aims to provide reliable information on the socio-economic structures, living standards, and consumption patterns of households in Turkey. It is the only micro-level dataset available with data on both household incomes and expenditures. HICES covers urban and rural households, however, due to the survey sampling design, it is not possible to make estimations on a regional or urban/rural basis.

We explore the Household Consumption Expenditure Surveys to collect data on total household expenditures, and expenditures on primary, secondary, and tertiary education. Table 1 provides the summary statistics for household expenditures; the values represent monthly expenditures in Turkish lira (TL). We then collect data on income and household characteristics using Household Income Surveys.

Table 1. Average household expenditure and education expenditure in Turkish lira

	2004	**2006**	**2008**	**2010**	**2012**	**2014**	**2016**
Total Expenditure	921	1,268	1,665	1,888	2,579	3,013	3,580
Education Expenditure	14.90	22.52	32.22	45.39	65.63	73.22	81.37
Primary	3.74	4.77	6.41	17.13	24.60	22.91	26.08
Secondary	4.31	10.29	13.88	13.06	16.10	31.23	38.35
Tertiary	3.23	4.47	6.16	10.21	17.89	21.66	20.33
Observations	4,427	4,431	4,301	712	4,666	5,273	5,941

Source: Author's calculations

The distribution of income among individuals within the same household is adjusted for the square root of household size. This approach implies that the needs for a family of four are twice as large as those of a single (OECD 2008, p. 47). Like Wagstaff et al. (2007), we refer to the adjusted income measure as the Ability to Pay (ATP). We derive ATP variables using total disposable income, total market income, and total expenditure. The average ATP values are presented in Table 2.

$$ATP_1 = \frac{\text{Total Disposable Income}}{\sqrt{\text{Household size}}} \quad (1)$$

$$ATP_2 = \frac{\text{Total Market Income}}{\sqrt{\text{Household size}}} \quad (2)$$

$$ATP_3 = \frac{\text{Total Expenditure}}{\sqrt{\text{Household size}}} \quad (3)$$

The total disposable income is composed of earnings from productive activities and transfers from government, non-government agencies and private

individuals and institutions (e.g., widow-orphan salaries, pensions, scholarships, and other things). Government transfers include retirement income, old-age benefits from social assistance funds, orphan's and widow's pension, disability pension, scholarships, unemployment benefits, and in-kind income. Nongovernment transfers are composed of retirement income, foreign currency, and other transfers from abroad (private pension, and in-kind income transfers from private individuals and agencies).

Table 2. Average Ability to Pay (ATP)

	2004	**2006**	**2008**	**2010**	**2012**	**2014**	**2016**
ATP_1	440.00	570.34	766.80	908.57	1,198.14	1,453.71	1,750.52
ATP_2	392.00	506.35	678.28	870.03	1,068.79	1,437.04	1,578.90
ATP_3	435.00	602.11	799.14	918.43	1,264.71	1,481.48	1,777.34
Observations	4,427	4,431	4,301	712	4,666	5,273	5,941

The distribution of income among individuals within the same household is adjusted for the square root of household size. ATP_1 is approximated by disposable income. ATP_2 excludes transfers and is approximated by market income. ATP_3 is approximated by total expenditure.

Source: Author's calculations

To determine the impact of these transfers we exclude the transfers and use market income (sum of employment income from wages and salaries) as another measure of the standard of living. Analyzing income distribution for disposable income and market income allows distinguishing between the effect of market forces and that of government policies.

In this paper we follow three approaches. First, the most direct way of assessing the progressivity of education financing is to examine education expenditure as a share of ATP. This allows us to determine the real economic burden of education expenditures rather than the distribution of nominal payments. Second, we use the more indirect approach and utilize the Lorenz dominance analysis and compare shares of education expenditures with shares of ATP (Wagstaff et al., 2007). Finally, to measure the magnitude of progressivity we use Kakwani index.

In the Lorenz dominance analysis, the Lorenz curve plots the proportion of the ATPs cumulatively earned by different income quintiles from the poorest to the richest; it presents the distribution of income within population. The concentration curve plots the cumulative shares of education expenditures and presents the distribution/concentration of education expenditures by income quintiles. If education expenditures account for the same proportion of ATP, then the shares of education expenditures for each quintile correspond to the share of ATP (Wagstaff et al., 2007). In such a case, the Lorenz curve lies on top of the concentration curve. For a progressive case, the poor will have lower shares of education expenditures

compared to their shares of ATP, and the concentration curve will lie below (i.e., will be dominated) by the Lorenz curve. In a regressive system, the poor will have higher shares of education expenditures compared to their shares of ATP, and the concentration curve will lie above the Lorenz curve. The weakness of this approach is that it only provides the general graphical representation and does not provide a measure of the magnitude of progressivity.

To measure the magnitude of progressivity and to supplement the graphical Lorenz dominance analysis we use the Kakwani index. Kakwani index is the most widely used summary measure of progressivity in the tax and health finance literature (Wagstaff and Van Doorslaer, 1992; Wagstaff et al., 1999). The Kakwani index is bounded between -2 and 1. A negative Kakwani index represents a regressive financing system (a concentration curve lies above the Lorenz curve), while a positive index represents a progressive financing system (a concentration curve lies below the Lorenz curve). Formally, the Kakwani index equals twice the area between the Lorenz curve and a concentration curve and equals the difference between the concentration index and Gini coefficient. The concentration index is defined with reference to the concentration curve and is twice the area between the concentration curve and the line of equality (the 45-degree line). The concentration index takes values between -1 and 1, negative values indicate a disproportionate concentration of education expenditures among the poor. The Gini coefficient is defined as the area between the Lorenz curve and the 45-degree line. The values of the Gini coefficient range between 0, in the case of "perfect equality", and 1, in the case of "perfect inequality".

5. Findings

The descriptive statistics presented in Table 3 indicate that during 2004-2016 the total disposable income, total market income, and total expenditure increased by around 3.8 times, while total education expenditure increased by 5.5 times. The highest increase is observed for the expenditure on secondary education, on average households were spending 9 times more on secondary education in 2016 compared to 2004.

Table 3. Average household income and expenditure in Turkish lira

	2004	**2010**	**2016**
Disposable Income	933.00	1,864.54	3,510.46
Market Income	835.00	1,791.82	3,179.62
Total Expenditure	921.00	1,268.97	3,580.17
Education Expenditure	14.90	45.39	81.37
Primary Education	3.74	17.13	26.08
Secondary Education	4.31	13.06	38.35
Tertiary Education	3.23	10.21	20.33

Source: Author's calculations

IJCEAS

International Journal of Contemporary Economics and Administrative Sciences
ISSN: 1925 – 4423
Volume: XIV, Issue: 2, Year: 2024, pp.567-587

5.1. Education Expenditures as a share of ATPs

Education expenditures vary with the choice of ATP. The differences in values are substantial for lower-income groups as their disposable incomes (ATP1) and market incomes (ATP2) highly differ due to the transfers. For high-income groups the differences across ATPs are minor. Tables 4-6 present total education expenditures as shares of ATPs for different quintiles. In Table 4 Ability-to-Pay is approximated by total disposable income. In Tables 5 and 6 it is approximated by total market income and total expenditure**.**

On average, during 2004-2016, households were spending between 2.14% and 3.6% of ATP1 on education. Education expenditures increased between 2004 and 2012 for all income groups and across all ATPs. For example, the poorest households spent 0.46% of ATP1 on education in 2004, and 2.81% in 2010. Moreover, in 2010, poorest quintile was spending more on education than the middle-income group (2.81% vs. 2.48%). In 2014 and 2016, education expenditures declined for every income group. However, the richest households were still spending significantly more during 2012-2016 than during 2004-2010.

Analyses of education expenditures as a share of market income, ATP2, indicate that in 2008, 2010, and 2012, the poorest quintiles spent more on education than 2nd, 3rd, and 4th income quintiles. In 2012, the poorest quintile spent 5.63% of ATP2, whereas the 4th quintile spent around 4.05%.

Results in Table 6 for ATP3 (approximated by total expenditure) are in line with the literature and show potential underreporting of income by the poorest. Although the first three quintiles are spending a lot less on education as a share of ATP3 compared to other ATPs, the overall pattern is similar - education expenditures peak in 2012, with a sharp increase for the richest households.

Table 4. Total education expenditure as a share of ATP_1

ATP_1 - Disposable Income	**2004**	**2008**	**2012**	**2016**
1st (Lower Class)	0.46%	1.74%	2.01%	1.03%
2nd (Lower Middle Class)	0.91%	2.42%	2.52%	1.61%
3rd (Middle Class)	2.05%	3.26%	3.11%	2.01%
4th (Upper Middle Class)	3.06%	3.32%	3.85%	3.09%
5th (Upper Class)	4.23%	5.09%	7.33%	6.88%
Average Education Expenditure	2.14%	3.16%	3.76%	2.92%

Source: Author's calculations

Table 5. Total education expenditure as a share of ATP_2

ATP_2 - Market Income	**2004**	**2008**	**2012**	**2016**
1st (Lower Class)	1.93%	5.07%	5.63%	2.92%
2nd (Lower middle Class)	1.70%	3.52%	3.82%	2.00%
3rd (Middle Class)	2.31%	3.96%	3.55%	2.32%
4th (Upper Middle Class)	3.13%	3.59%	4.05%	3.70%
5th (Upper Class)	4.44%	5.26%	7.62%	6.83%
Average Education Expenditure	2.70%	4.28%	4.93%	3.55%

Source: Author's calculations

Table 6. Total education expenditure as a share of ATP_3

ATP_3 - Total Expenditure	**2004**	**2008**	**2012**	**2016**
1st (Lower Class)	0.15%	0.88%	1.14%	0.49%
2nd (Lower Middle Class)	0.66%	1.63%	2.13%	1.37%
3rd (Middle Class)	1.60%	2.64%	3.10%	1.67%
4th (Upper Middle Class)	2.75%	3.51%	3.98%	3.09%
5th (Upper Class)	4.80%	5.13%	6.82%	7.08%
Average Education Expenditure	1.99%	2.76%	3.44%	2.74%

Source: Author's calculations

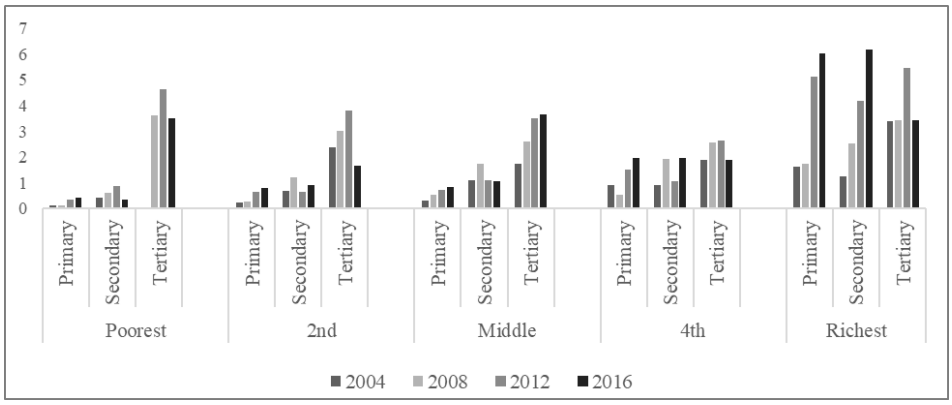
In terms of expenditures by education levels, Figure 3 shows that primary education expenditures increased for every quintile, secondary education expenditures increased for the 4th and 5th quintiles, and tertiary education expenditures increased for the 1st and 3rd quintiles.

Primary education expenditures highly vary across the income groups. The first four quintiles spent between 0.12% and 1.95% on primary education between 2004 and 2016, while the richest quintile spent between 1.63-6.01%. More importantly the increase in primary education expenditures was not gradual, the richest households sharply increased their expenditures from 1.75% in 2008 to 5.13% in 2012. In 2016, the richest quintile was spending significantly more on primary education than on tertiary education (6.01% vs. 3.42%).

Although the government has been investing heavily into tertiary education, there have been limited impacts on significant improvements in the distribution of tertiary education expenditures. Expenditures on tertiary education increased for the low-income groups but stayed the same for the richest quintiles. Our findings indicate that in 2016, the lowest and highest income quintiles had equal education expenditures on tertiary education as a share of ATP_1.

International Journal of Contemporary Economics and Administrative Sciences
ISSN: 1925 – 4423
Volume: XIV, Issue: 2, Year: 2024, pp.567-587

Figure 3. Education expenditure by level of education as a share of ATP_1



Source: Author's estimates

5.2. "Lorenz Dominance" Analysis

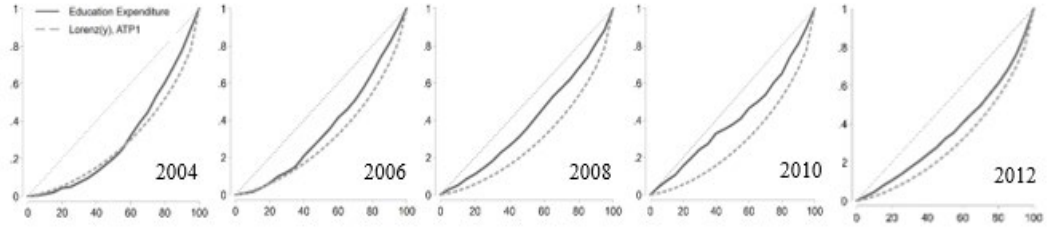
To better understand and illustrate the burden of education expenditures across different income quintiles we supplement the education share analysis with Lorenz dominance analysis. We compare a graphical representation of the distribution of income, Lorenz curve, with a graphical representation of the distribution of education expenses, concentration curve. If the share of education expenditure corresponds to the group's share of ATP, the concentration curve lies on top of the Lorenz curve. Under a progressive system, the low-income group's share of ATP is higher than its share of education expenditure and the Lorenz curve dominates (lies above) the concentration curve. Under a regressive system, the low-income group's share of ATP is lower than its share of education expenditure and the Lorenz curve is dominated (lies below) the concentration curve.

For ATP_1 (approximated by total disposable income) for five years out of seven the Lorenz curve lies below the concentration curve. For ATP_2 (approximated by market income) the Lorenz curve lies below the concentration curve for all seven years. And for ATP_3 (approximated by total expenditure) in four cases out of seven the Lorenz curve lies on top of the concentration curve – the education financing system is neither progressive nor regressive.

Based on the Lorenz dominance analyses presented in Figure 4 education financing as a share of ATP_1 was progressive in 2004. By 2010, the gap between the share of education expenditures and the share of income grew larger and education financing became regressive as a share of ATP_1. The Lorenz dominance analysis for ATP_2 indicate that the Lorenz curve was dominated by concentration curve for every year during 2004-2016. Furthermore, in 2008 the non-transfer

income of the poorest quintile collapsed, the 2008, 2010 and 2012 concentration curves lie above the Lorenz curve and lie above the 45-degree line. This implies that education expenditures as a share of market income were heavily concentrated in low-income groups. Looking at the analysis for ATP_3, only for 2004, 2006, and 2016, can it be argued that education financing was progressive. In other years, the financing was neither progressive nor regressive.

Figure 4. Lorenz dominance analysis for total education expenditure as a share of ATP_1.



Source: Authors' estimates

Graphical representations of the expenditures by education level in Figure 5 indicate that the financing of primary education has been progressive, and the expenditures on primary education as a share of ATP_1 and ATP_3 have been concentrated in the high-income groups. The financing of tertiary education has been regressive, the concentration curve dominates the Lorenz curve across all years and ATPs, with no improvements for lower-income groups during 2008-2014.

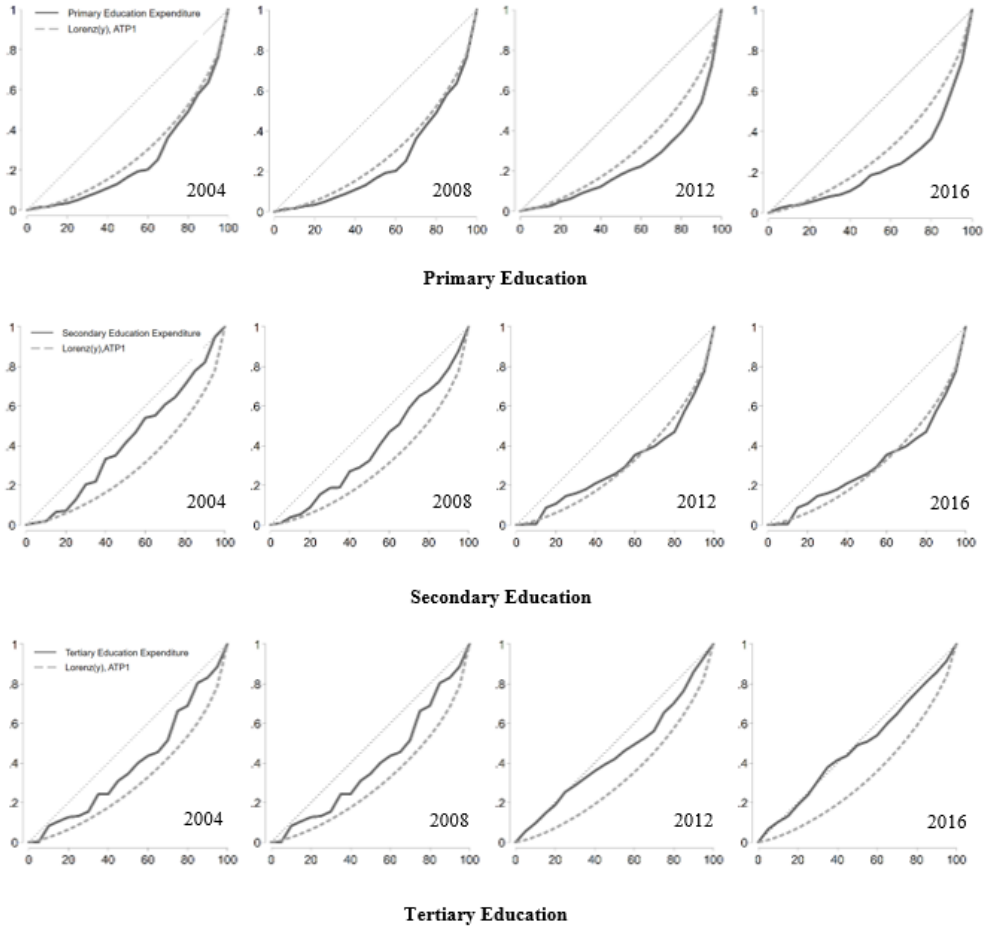
It is difficult to derive conclusions for secondary education financing. The financing might be regressive for 2004 and 2008, and progressive for 2012 and 2016. The results seem robust for 2016, as the Lorenz curve dominates the concentration curve for ATP_1 and ATP_3, for ATP_2 the shares of education expenditures and income seem to be equal.

5.3. Kakwani Indices

We use Kakwani indices to measure the magnitude of regressivity presented in Figures 4 and 5. A negative Kakwani index represents a regressive financing system, while a positive Kakwani index represents a progressive financing system. Formally, the Kakwani index is bounded between -2 and 1. For total education expenditures in Turkey, Kakwani values range between -0.444 and 0.110. The Kakwani indices are negative for all seven years for ATP_1 and ATP_2 and negative for three years for ATP_3 (for the other four years the positive values range between 0.0-0.1, and therefore do not indicate progressive education financing system).

International Journal of Contemporary Economics and Administrative Sciences
ISSN: 1925 – 4423
Volume: XIV, Issue: 2, Year: 2024, pp.567-587

Figure 5. Education expenditure as a share of ATP_1.
ATP_1 is approximated by disposable income and is adjusted for the square root of household size.



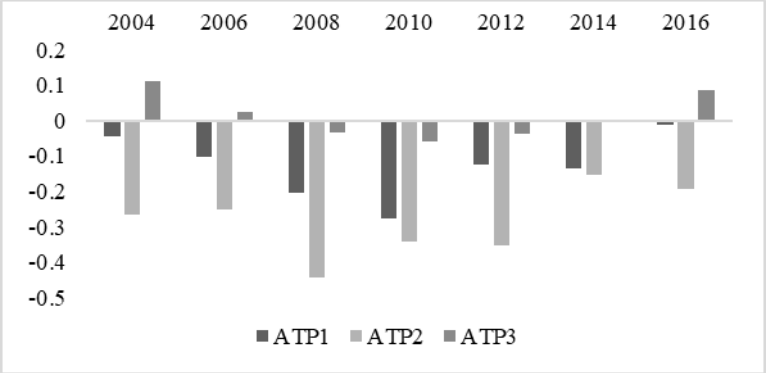
Source: Author's estimates

The magnitudes of Kakwani indices presented in Figure 6 indicate worsening of education financing equity during 2004-2010 for all ATPs. The Kakwani indices for ATP_1 indicate that the transfers correct the market inequality to some extent as the magnitude of regressivity is lower for education expenditures as a share of total disposable income compared to the regressivity of education expenditures as a share of total market income.

The values and signs of Kakwani indices vary drastically across the education levels. The index has increased over time for primary and secondary education levels, with the highest values in 2016, but has mostly worsened for

tertiary education. Figure 7 shows that the primary education financing is progressive, while tertiary education financing is regressive.

Figure 6. Kakwani indices for total education expenditure



The distribution of income among individuals within the same household is adjusted for the square root of household size. ATP_1 is approximated by disposable income. ATP_2 excludes transfers and is approximated by market income. ATP_3 is approximated by total expenditure.

Source: Author's estimates

To summarize, the examination of education expenditures as a share of ATPs shows that expenditures on education increased over time for every income quintile. Analyses of ATP_1 and ATP_2 indicate that lower income groups heavily rely on transfers, and in terms of ATP_2, approximated by total market income, lower income and higher income groups have similar expenditures on education. In 2008, 2010 and 2012 the poorest households spent more on education as a share of their market income than did the households in middle and upper-middle quintiles.

In terms of different education levels, findings indicate that high-income groups spend more on primary and secondary education, therefore education expenditures for these levels are concentrated in upper classes and financing is more progressive. Moreover, the results show that in 2012 primary education expenditures sharply increased for the richest quintile, from 1.75% in 2008 to 5.13% in 2012. A similar increase, but lower in magnitude, was observed for the upper middle-income group, primary education expenditures increased from 0.55% in 2008 to 1.53% in 2012. One potential explanation for this change could be the passage of the "4+4+4 Law". Another key finding of this paper is the regressivity of tertiary education financing. Table 7 presents expenditures on tertiary education as a share of ATP_1. Although the government has been subsidizing tertiary education, evaluation of concentration of tertiary education expenditures shows that lower-income groups have not been the key beneficiaries of these policies. The shares of education expenditures on tertiary education have increased for the poorest quintile and decreased for the upper classes.

IJCEAS

International Journal of Contemporary Economics and Administrative Sciences
ISSN: 1925 – 4423
Volume: XIV, Issue: 2, Year: 2024, pp.567-587

6. Conclusion

This paper analyzes the burden of out-of-pocket expenditures on education in Turkey across different income quintiles. The goal of the study is to evaluate equity in education financing in Turkey and examine whether education financing presents a bias against poor and/or a bias in favor of higher education. To measure the progressivity of education financing, we first calculate education expenditures as shares of ATPs for different income quintiles. We then utilize Lorenz dominance analysis and compare the distribution of income with the distribution of education expenditures. Lastly, we use Kakwani indices to measure the magnitude of progressivity.

Our findings indicate that during 2004-2016, education expenditures as a share of three different proxies of the standard of living (disposable income, market income, and total expenditure) increased for every income quintile. Total education expenditures are concentrated in upper-income households, however, analysis of these expenditures as a share of market income indicates that in 2008, 2010, and 2012 poorest households spent more on education than 2nd, 3rd, and 4th quintiles. In addition, the Lorenz dominance analyses show that the low-income group's share of ATP is often lower than its share of education expenditures – suggesting a regressive education financing system. The Kakwani indices are negative for all seven years for ATP_1 and ATP_2, and negative for three years for ATP_3.

Our analyses of expenditures by education level show that primary education financing is progressive, whereas tertiary education financing is regressive. While the government has been investing heavily in tertiary education, tertiary expenditures of the poorest quintiles have increased, and expenditures of the richest quintiles have stayed the same. Although Kakwani indices increased (the system became more progressive) for primary and secondary education levels in 2012 and 2016, our analysis suggests that those changes were driven by the drastic increases in the primary education expenditures by the upper classes after the passage of the "4+4+4 Law" in 2012. Possibly in a search for better primary education, high-income groups increased their primary education expenditures from 1.75% in 2008 to 5.13% in 2012, and 6.01% in 2016.

Overall, our findings indicate that the provision of education policies in and of itself is not sufficient for attaining a more equitable education system. The distribution of funding across education levels matters for effectiveness and the impacts of policies need to be carefully evaluated. The results of this study can be further expanded by studying causal associations more formally, and by detailed examination of transfer payments and their impacts. It will also be beneficial to analyze middle school expenditures separately, as it is likely that sharp increases in secondary education expenditures in 2012 stem due to the division of the eight-year primary education into two stages each lasting four years.

REFERENCES

Acar, E. Ö., Günalp, B., & Cilasun, S. M. (2016). An empirical analysis of household education expenditures in Turkey. International Journal of Educational Development, 51, 23-35.

Adams, S. J. (2002). Educational attainment and health: Evidence from a sample of older adults. Education Economics, 10(1), 97-109.

Aghion, P., Ljungqvist, L., Howitt, P., Howitt, P. W., Brant-Collett, M., & García-Peñalosa, C. (1998). Endogenous growth theory. MIT press.

Aksit, N. (2007). Educational reform in Turkey. International Journal of Educational Development, 27(2), 129-137.

Ashenfelter, O., & Krueger, A. (1994). Estimates of the economic return to schooling from a new sample of twins. The American economic review, 1157-1173.

Bonal, X. (2007). On global absences: Reflections on the failings in the education and poverty relationship in Latin America. International Journal of Educational Development, 27(1), 86-100.

Caner, A., & Okten, C. (2013). Higher education in Turkey: Subsidizing the rich or the poor? Economics of Education Review, 35, 75-92.

Cristia, J., Ibarrarán, P., Cueto, S., Santiago, A., & Severín, E. (2017). Technology and child development: Evidence from the one laptop per child program. American Economic Journal: Applied Economics, 9(3), 295-320.

Deaton, A., & Grosh, M. (2000). The consumption module in the Living Standards Measurement study. Designing household survey questionnaires for developing countries: Lessons from ten years of LSMS experience.

Duflo, E. (2001). Schooling and labor market consequences of school construction in Indonesia: Evidence from an unusual policy experiment. American economic review, 91(4), 795-813.

Duman, A. (2008). Education and income inequality in Turkey: does schooling matter? Financial Theory and Practice, 32(3), 369-385.Frank Porter Graham Child Development Institute. The Carolina Abecedarian Project: Groundbreaking follow-up studies. Retrieved September 16, 2015, from http://abc.fpg.unc.edu/groundbreaking-follow-studies External Web Site Policy

Gakidou, E., Cowling, K., Lozano, R., & Murray, C. J. (2010). Increased educational attainment and its effect on child mortality in 175 countries between 1970 and 2009: a systematic analysis. The lancet, 376(9745), 959-974.

Gün, F., & Baskan, G. A. (2014). New education system in Turkey (4+ 4+ 4): A critical outlook. Procedia-Social and Behavioral Sciences, 131, 229-235.

GÜRLER, Ö. K., & DEMİROGLARI, S. (2020). Determinants of household education expenditures by education level: The case of Turkey. International Journal of Contemporary Economics and Administrative Sciences, 10(1), 235-258.

İnal, K., & Akkaymak, G. (Eds.). (2012). Neoliberal transformation of education in Turkey: Political and ideological analysis of educational reforms in the age of the AKP. Springer.

Krueger, A. B., & Lindahl, M. (2001). Education for growth: Why and for whom? Journal of economic literature, 39(4), 1101-1136.

Lleras-Muney, A. (2005). The relationship between education and adult mortality in the United States. The Review of Economic Studies, 72(1), 189-221.

Lucas Jr, R. E. (1988). On the mechanics of economic development. Journal of monetary economics, 22(1), 3-42.

Makate, M., & Makate, C. (2016). The causal effect of increased primary schooling on child mortality in Malawi: Universal primary education as a natural experiment. Social Science & Medicine, 168, 72-83.

Mercan, M., & Sezer, S. (2014). The effect of education expenditure on economic growth: The case of Turkey. Procedia-Social and Behavioral Sciences, 109, 925-930.

Meyer, B. D., & Sullivan, J. X. (2003). Measuring the well-being of the poor using income and consumption.

Meyer, B. D., & Sullivan, J. X. (2011). Further results on measuring the well-being of the poor using income and consumption. Canadian Journal of Economics/Revue canadienne d'économique, 44(1), 52-87.

Ministry of National Education, Republic of Turkey. "National Education Statistics, Formal Education" (2020). http://sgb.meb.gov.tr/meb_iys_dosyalar/2020_09/04144812_meb_istatistikleri_orgun_egitim_2019_2020.pdf. Accessed May 28, 2021

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.

OECD, Education GPS. "Turkey, Overview of the education system (EAG 2020)" (2020) https://gpseducation.oecd.org/CountryProfile?primaryCountry=TUR&threshold=10&topic=EO Accessed May 28, 2021

OECD Indicators. "Education at a Glance 2019: Turkey" https://www.oecd.org/education/education-at-a-glance/EAG2019_CN_TUR.pdf Accessed May 28, 2021

Organisation for Economic Co-operation and Development. (2008). Growing unequal?: income distribution and poverty in OECD countries. OECD Publishing.

Özdemir, C. (2016). Equity in the Turkish education system: A multilevel analysis of social background influences on the mathematics performance of 15-year-old students. European Educational Research Journal, 15(2), 193-217.

Patrinos, H. A. (2016). Estimating the return to schooling using the Mincer equation. IZA World of Labor.

Patrinos, H. A., Psacharopoulos, G., & Tansel, A. (2021). Private and social returns to investment in education: the case of turkey with alternative methods. Applied Economics, 53(14), 1638-1658.

Psacharopoulos, G. (1986). Financing Education in Developing Countries: An Exploration of Policy Options. The World Bank, 1818 H Street, NW, Washington, DC 20433.

Psacharopoulos, G., & Patrinos*, H. A. (2004). Returns to investment in education: a further update. Education economics, 12(2), 111-134.

Romer, P. M. (1990). Endogenous technological change. Journal of political Economy, 98(5, Part 2), S71-S102.

Şener, M. Y. (2016). Conditional cash transfers in Turkey: A case to reflect on the AKP's approach to gender and social policy. Research and Policy on Turkey, 1(2), 164-178.

Simon, F., Małgorzata, K., & Beatriz, P. O. N. T. (2007). Education and training policy no more failures ten steps to equity in education: Ten steps to equity in education. oecd Publishing.

Silles, M. A. (2009). The causal effect of education on health: Evidence from the United Kingdom. Economics of Education review, 28(1), 122-128.

Sylwester, K. (2002). Can education expenditures reduce income inequality? Economics of education review, 21(1), 43-52.

Tansel, A., & Bircan, F. (2006). Demand for education in Turkey: A tobit analysis of private tutoring expenditures. Economics of education review, 25(3), 303-313.

Tolu, H. (2014). The politics of the ICT4ED (Fatih) project in Turkey. Policy Futures in Education, 12(6), 832-849.

UNESCO, G. (2014). Teaching and learning: Achieving quality for all. (Education for All Global Monitoring Report 2013/4).

UNESCO Institute for Statistics (UIS), FHI 360 Education Policy and Data Centre, Oxford Policy Management, & Research for Equitable Access and Learning. (2018). Handbook on measuring equity in education.

UNESCO UIS. (2020). Out-of-School Children and Youth. http://uis.unesco.org/en/topic/out-school-children-and-youth. Accessed May 28, 2021

UNICEF. 2014. Policy Paper on Improving Conditional Cash Transfers Programme in Turkey https://www.unicef.org/turkey/media/5331/file/POLICY%20PAPER%20on%20Improving%20Conditional%20Cash%20Transfers%20Programme%20in%20Turkey,%202014.pdf Accessed May 28, 2021

Unicef. (2015). The investment case for education and equity. Unicef.

Ural, A. (2012). The Dershane Business in Turkey. In Neoliberal Transformation of Education in Turkey (pp. 151-163). Palgrave Macmillan, New York.

U.S. Department of Health and Human Services. (n.d.). Why is early learning important? Eunice Kennedy Shriver National Institute of Child Health and

Human Development. https://www.nichd.nih.gov/health/topics/early-learning/conditioninfo/matter. Accessed May 31, 2021

Wagstaff, A., O'Donnell, O., Van Doorslaer, E., & Lindelow, M. (2007). Analyzing health equity using household survey data: a guide to techniques and their implementation. World Bank Publications.

Wagstaff, A., & Van Doorslaer, E. (1992). Equity in the finance of health care: some international comparisons. Journal of health economics, 11(4), 361-387.

Wagstaff, A., Van Doorslaer, E., Van der Burg, H., Calonge, S., Christiansen, T., Citoni, G., ... & Winkelhake, O. (1999). Equity in the finance of health care: some further international comparisons. Journal of health economics, 18(3), 263-290.