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Government Expenditure on Education and Its Impact on Access: A Narrative of the Czech Republic

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Abstract
The paper presents a pictorial trend of the Czech government's educational expenditure on education as a percentage of the country's GDP from 1998 to 2017. It begins with a brief profile of the country and its educational system. Its primary concern is focused on the government's funding source of education; how much percentage of the GDP is spent on education; how much is spent on each student; how these funds are spent; which of the levels of education receives more funding; and how this funding affects educational access at all the levels of education in the country. In an attempt to achieve the research aim, the study employed descriptive statistics to examine and analyze the funding trends at the various levels of education and their impact on enrolments using secondary data from the UNESCO Institute Statistics website. The study reveals taxation from the public as the main source of funding for education; the decentralized system is used to fund education; and the average expenditure between 1998 and 2017 is 3.5% lower than the OECD average of 5%. The findings further reveal that the Czech government's gross expenditure on education as a whole increased steadily over the years, even though it has been below the average standard of 5% of the OECD for the period of study. The government spent more on secondary education than the other levels, and lastly, government funding on education has a significant impact on students' gross enrolment, especially at the secondary and tertiary levels.

Keywords: Government Expenditure, Secondary Education, Primary Education, Tertiary Education, Gross Domestic Product

1. Introduction

Education is viewed as the most significant investment by governments around the world in increasing economic growth, equity, and sustainability, as well as the overall change of communities (Nurudeen et al. 2020). Human capital is crucial to the global economic development and stability of nations (Topel, 1999). This human capital may be cultivated and developed by providing people with the essential skills and competence to ensure the success of these countries' labor markets (Nurudeen et al. 2020). Education is essential to a country's growth because it develops human capital for high-level science, technological, vocational, and management roles in both the public

and commercial sectors. In the Czech Republic, investing in education benefits both individuals and society as a whole. It boosts economic growth and development in order to meet the constitutional mandate of universal education. This is in line with the United Nations Sustainable Development Goals, which set a variety of goals. It ensures that all children, regardless of gender, have free access to a basic education of high quality. As a result, more relevant and effective learning feedback is provided, as well as gender balance in education and equitable access to all levels of school. People with disabilities, indigenous peoples, and young children in danger will all have access to vocational opportunities by 2030. (UNESCO, UIS Education Survey, 2017).

Governments around the world fund education to promote access and quality, and funding has been shown in studies to boost access and quality in education (Nurudeen et al. 2020; Dynarski & Scott-Clayton, 2013; Solis, 2017; Meneses & Blanco, 2010; Castleman & Long, 2016; Hossler, 2000 & Singell, 2004). The European Community's views on educational funding are consistent with what these researchers have stated. The European Community's policy recommendations also emphasized the importance of "efficiency" and "equity" in the provision of education (EC, 2006), but stressed that European countries must provide educational services while minimizing the amount of public money devoted to them, given the need to strictly control public budgets (European Commission Report, 2020). Surprisingly, the amount of public money committed to education varies greatly across EU countries, owing to their distinct characteristics and policy orientations in this area (Busemeyer, 2007; Wolf & Zohlnhofer, 2009). The expenditure on basic and secondary education (up to the International Standard Classification of Education, level 3) reported by the OECD (across several years) varies greatly, ranging from roughly 2.5 percent of GDP (Greece) to more than 5 percent (Denmark). This problem enables certain countries to maintain their education expenditure efficiency, i.e., while others fail to achieve equal achievements in terms of education performance and a limited amount of expenditure. The educational systems are intended to deliver good results with the available resources given the amount of money spent on education (and determined by politicians). This paper, therefore, aims at examining evidence from data to see if school funding has any impact on educational outcomes (access) in the Czech Republic.

In an attempt to effectively examine the impact of government funding on educational access, the paper will present the profile of the Czech Republic, the educational system, the source of funding for education, how much is spent on education, how the funding is spent (centralized or decentralized), and how much is spent on each level of education.

This paper is arranged as follows: the first section will present the profile of the Czech Republic; the educational system; the source of funding for education; how the funding is spent (centralize or decentralize); how much is spent on each level of education; and the gross enrolment ratios of the educational levels. The second section will analyze the results from data on education funding trends and their impact on gross enrolment ratios. Lastly, the paper concludes by offering a discussion and a befitting conclusion.

1.1. The Czech Republic's Profile

It was founded in 1993, when it was divided into what is currently known as the Federal Republic of Slovakia. Ever since the end of the First World War, the former Czechoslovakia joined the two countries. The Czechs and the Slovaks, united after the war, hoped that the Soviet Union would give them the freedom to choose their government and that the country would serve as a bridge between the West and the East. The Soviet-led Communist Party seized control by purging reform-led groups and setting up hardliner Antonin Novotny as the party's leader. These hopes have been short-lived.

Slovak-born Alexander Dubcek succeeded Novotny in 1968 as leader of the party and began a short period of economic, social, and political change. He was recognized for "giving a human face" to socialism. In one year, the Soviets and Warsaw Pact, which were threatened by the popularity of their reforms, invaded and deposed Dubcek. Czechoslovakia's reforms languished during the next decade. Continued efforts to boost Europe's once-leading economy have not succeeded.

Political reform re-emerged by the late 1970s. The Charter 77 was founded in 1977, and a group of human rights defenders started to work in Czechoslovakia to improve conditions. Economic reform efforts began to bear fruit again during this time. Exports have increased, debts in hard currencies have fallen, and the economy has grown steadily. New investment in the electronic, chemicals, and pharmaceutical industries was made, which by the mid-1980s became leading industries in Eastern Europe. At the end of the decade, efforts to alter policies were at the forefront. Following the termination of a nonviolent student demonstration with brutality by the State Police, the Civic Forum was formed to unify activists around the country. As its leader, Vaclav Havel came up. The Community Party all but collapsed in 1990 in Czechoslovakia until the conclusion of this year and the first free elections since 1946.

Although the Civic Forum was successful in ousting the communist regime, it was ineffective as a ruling party. Rival factions quickly arose, and federalists like Havel were unable to stem the tide of nation-splitting. Three years after the elections, the Czech Republic was created. The Czech Republic is a parliamentary democracy in which the President is elected by the legislature. Vaclav Klaus is the Czech Republic's current president, and Andrej Babi, a member of the ANO party, is the country's new prime minister. The Assembly of Deputies and the Senate are the two chambers of the parliament. The Czech Republic is divided into municipalities and 14 newly constituted regions, each of which has elected governors. Both are in charge of education. The Czech population is estimated to be 10.65 million people. Among Poles and Romanians, they are the most numerous ethnic minorities (Eurostat, 2019).

1.2. The education system

The Czech education system offers education from pre-primary through university levels, as well as additional services, extracurricular activities, and school meals. Czech children must start school at the age of six and complete a minimum of nine years of basic education. Almost 90% of children aged 3 to 6 attend nursery schools, which are usually free. The first five years of elementary school are referred to as primary school, while the next four years are referred to as lower secondary school. Although the majority of children attend neighbourhood schools, the choice of school is unrestricted. After finishing compulsory education, pupils can attend one of three types of higher secondary institutions: gymnasiums, technical/professional schools, or vocational schools. More than 90% of students continue on to upper secondary school. Students apply to these schools, which determine their admission requirements. About 15% of students go to high school (pre-university curriculum), some 25% go to technical/professional school, and some 60% attend vocational school. A gym for younger children, in 5th or 7th grade, is a recent addition. Approximately 10% of younger pupils (from the sixth grade) go to these institutions. After passing subject-based tests offered and assessed by each school, students graduating from gymnasiums, technical/professional schools, and the longer, more academically oriented programs at vocational schools got a "maturite" certificate. Two compulsory subjects (Czech and a foreign language) and two optional topics (as determined by the school) are required. A vocational certificate is awarded to students who complete shorter vocational programs. A lot more students are taking part in programs that lead to a "maturite" now than they were a decade ago. Students with a "maturite" can go on to university, a technical school with professional training, or a higher vocational program after finishing upper secondary school. In the 1990s, higher vocational programs were established. Initially, they resulted in a terminal vocational certificate, but subsequent reforms have permitted students to transfer to a university and earn credit toward a university degree. Higher vocational programs replaced the short programs that technical schools used to offer to high school graduates who wanted to be more marketable. Higher education has been the most significantly transformed sector, with the establishment of autonomous institutions and the establishment of a non-university sector for vocational training. Enrolment in higher education has more than doubled since the 1990s, albeit remaining low by EU standards. In the Czech Republic, there are currently 62 higher education institutions, 26 of which are public and 36 of which are private. Higher education is free for students, but higher education institutions can charge individuals and businesses for courses. Private higher education institutions develop study programs that must be recognized by an independent Accreditation Commission. They have the authority to levy fees and impose restrictions. Bachelor, master, and doctorate degrees are awarded by both public and private higher education institutions. Candidates for a degree must pass national exams. Gymnasiums account for approximately 48% of those admitted to higher education institutions, upper

secondary technical schools account for 47%, and vocational schools account for 5%. Despite the expansion of slots in higher education, the industry will only meet around 60% of the demand for slots.

Students receive extensive technical training at professional institutions. The curriculum is developed by the school and is approved by the Ministry. Each school establishes its own admissions criteria and administers its own entrance examination. These programs lead to a specialized diploma. Students receive their diploma after passing an exam that includes both a practical and theoretical component. These tests are created by schools and then approved by the Ministry. As previously stated, since 1998, these diplomas can be applied toward a bachelor's degree if a student wishes to transfer to or move onto a university.

1.3. Governance of the Educational System

The Ministry of Education determines the educational content for the primary and high school systems (called framework education programs). Curricula that adhere to these frameworks are chosen by schools. During the 2006/07 school year, new frameworks are being developed and deployed. Until then, schools select curricula from a list approved by the Ministry and adhere to the 1995 education standards. Schools already have a lot of flexibility in how they structure their curriculum and educate students. The Ministry also includes the Czech School Inspectorate, which is in charge of inspecting schools and school infrastructure, educational accomplishments, and financial management. Municipalities are in charge of nursery schools and primary schools (grades 1–9), while regions are in charge of secondary and vocational education. Education commissions or school boards are formed by municipalities. School principals are appointed by regional authorities and local school boards. Since 2001, higher education institutions have been autonomous. An impartial Accreditation Commission accredits higher education programs. Schools have the authority to employ and fire teachers, to adopt curricula, and to manage their finances. Every school is expected to organize a school council to assist the principal in managing the school. Compulsory schools choose from a list of Ministry-approved curricula. They are allowed to utilize any school organization and teaching practices they like. Schools choose or construct curricula for the upper secondary level, which must be approved by the Ministry. For the first time, the changes enabled the establishment of private schools. While some have been established, they constitute only a small percentage of the schools.

1.4. Education Funding

Education and funding in the Czech Republic are decentralized. Different degrees of education are overseen by two levels of local government. Municipalities (obec) control and fund elementary schools, whereas regions (kraj) govern and fund secondary schools. Local governments are divided into two levels. The Czech Republic is divided into 14 regions, including the capital city of Prague. The remaining areas have an average population of 714 thousand, ranging from 300 thousand in the Karlovy Vary region to 1.32 million in the Central Bohemian region (the region surrounding the capital city, with offices in Prague).Thus, regions have very large local governments, and their networks of secondary schools, both general academic and vocational, are correspondingly extensive. There is more than enough space for school profiles, improving coordination and enhancing school efficiency (such as maintaining large class sizes). Regions' education duties are complicated, requiring careful strategic planning and control of a wide range of institutions. Aside from sponsoring secondary schools, regions are also responsible for distributing education grants to all towns within their area. In comparison, there are 625 municipalities, one of which is Prague. The average size of a Czech municipality (excluding Prague) is 1484 inhabitants, with over 70% of municipalities having fewer than a thousand residents. As a result, many localities do not manage a single elementary school, and the majority have only one. As a result, in many circumstances, efficiency is less essential to the municipality than the school's survival, and attempts are made to keep it open despite small classrooms. Municipal education obligations are thus often reduced to overseeing and subsidizing a single school, with the primary goal of guaranteeing its continued functioning. Prague is, of course, an exception, as are capital cities throughout Central Europe. It manages and finances both elementary and secondary schools. Also, it is split up into many different municipal districts, each of which has its own set of educational responsibilities.

1.5. The main funding sources for Czech schools

In the Czech Republic, education funding is decentralized. Education is funded by public sources like taxes, local charges, and equalization funds at both the central (state) and municipal levels. Taxation is the primary source of funding for education in the Czech Republic, and the form of tax used is Value Added Tax (VAT). This tax is typically levied at a rate of 21% on deliveries of goods and services within the Czech Republic. Certain supplies (for example, foodstuffs and building work related to social housing) are taxed at a rate of 15%, with a second reduced rate of 10% applied to certain kinds of commodities (some medicaments, books, newspapers, and also supplies of heat and cold). In terms of tax-to-GDP ratio, the Czech Republic ranked 17th out of 37 OECD countries in 2019. In 2019, the Czech Republic's tax-to-GDP ratio was 34.9 percent, compared to the OECD average of 33.8 percent. In terms of tax-to-GDP ratio, the Czech Republic was ranked 17th out of 37 OECD nations in 2018. (OECD Report, 2019). This suggests that the country's educational system is supported by taxation. At the primary, secondary, and post-secondary non-university levels, public funding accounts for approximately 91 percent of total spending, and 73 percent at the tertiary level. All recurring (non-investment) education expenditures of Czech schools and educational institutions are separated into two categories: "direct costs" (the central component) and "operational costs" (local component). Direct costs are provided by the central (state) budget, whereas operating costs are handled by local budgets. The direct costs that are regulated by the state are covered by a central grant. These largely comprise teacher and other staff salaries; textbooks; teaching aids; further professional development for teachers, and other labor-related expenses. The funds for the central component are divided into per-student normative amounts and distributed to regions via education grants. In this approach, the state assumes responsibility for the financing of those educational functions that are centralized, such as teaching and textbooks. Thus, if the state decides to boost teacher wages or expand the curriculum, it will raise the national normative amounts sufficiently to compensate local governments for the extra costs. The second, local component includes school operations costs. These are education expenses that cannot be regulated financially since they are determined by a variety of circumstances, including local input pricing. This component covers school maintenance, energy expenses (heating, electricity, gas), communal services (water provision, rubbish disposal), and minor repairs. Regional and municipal general funds, including shared taxes, local fees, and equalization grants, are used to fund school operational costs. These revenues are expected to climb in tandem with inflation, which is the primary factor driving the increase in operational costs.

2. Method

The descriptive statistics approach was used to collect secondary data on the Czech government's annual education expenditure as a percentage of GDP, annual expenditure per student, and gross enrolment ratios at the primary, secondary, and university levels of education. The data on yearly government expenditure on education and the gross enrolment ratio for primary and secondary schools were obtained from the UNESCO Institute Statistics website, while the gross enrolment ratios for universities were obtained from the World Bank/ World Development Indicators website. Secondary data was taken from these websites and entered into an excel spread sheet. It was then sorted and categorized in tables under headings, and graphs were created to visually examine and evaluate patterns in these graphs.

3. Results

3.1. Government Expenditure on Education as a percentage of GDP

The total public expenditure on education relative to GDP for all the levels in the Czech Republic was in 1998 – 3.05% of GDP; in 1999 – 3.18% of GDP and in 2000 – 3.17% of GDP (UNESCO Statistic report). Public expenditure on education gradually rose but not on a large margin after 1998 to 2017. The government expenditure by each level of education can be seen in table 1. Expenditure on educational institutions in the Czech Republic is lower than on average across the Organization for Economic Co-operation and Development (OECD, 2019). Total (public and private) expenditure on primary to tertiary education as a percentage of gross domestic products (GDP) was 3.5% in 2016, well below the OECD average of 5.0%. The small marginal increase in educational funding seemed to be caused by factors similar to the exchange rate crisis in May 1997, the “government packages” in

spring 1997, which were aimed at maintaining the balanced government budget and thus introducing radical budget cuts, had negative effects on the education budget as well. The table further shows that total spending across all levels of education has fluctuated significantly in the Czech Republic between 2005 and 2016. While total spending on primary, secondary educational institutions increased steadily during this period, total expenditure on tertiary institutions increased between 2005 and 2011 but then started falling. Expenditure between 2011 and 2016 decreased more quickly than student numbers resulting in a decrease in spending per student at the tertiary level during this period.

The Governmental long-term strategic document – White Book (2001) - sets the aim of raising public expenditure on education to 6% of GDP. Even though we could observe (see Table 1 and Figure 1) a positive trend of rising expenditure from 1998, the target of 6% of GDP is still beyond the present reach.

Table 1: Government expenditure on education as a percentage of GDP

	Primary	Secondary	Tertiary
Year			
1998	0.62	1.75	0.68
1999	0.66	1.81	0.71
2000	0.66	1.82	0.69
2001	0.63	1.89	0.72
2002	0.64	2.02	0.79
2003	0.65	2.09	0.86
2004	0.61	2.04	0.86
2005	0.56	2.01	0.82
2006	0.57	1.99	1.13
2007	0.54	1.84	0.99
2008	0.55	1.81	0.89
2009	0.66	1.93	0.97
2010	0.66	1.86	0.92
2011	0.69	1.83	1.1
2012	0.71	1.87	1
2013	0.73	1.79	0.88
2014	0.74	1.74	0.8
2015	0.77	1.73	0.77
2016	0.74	1.62	0.7
2017	0.81	1.72	0.7

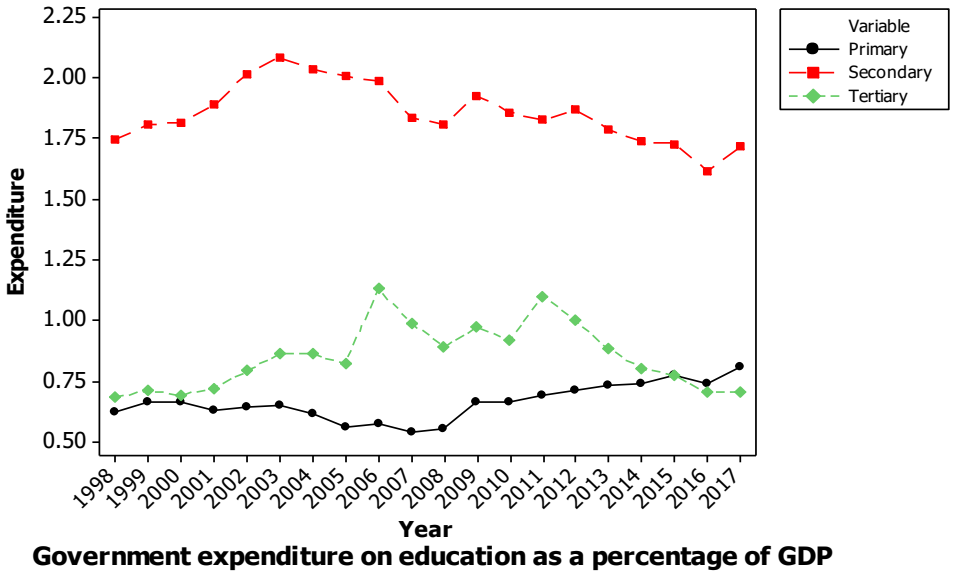

Figure 1: The total public expenditure on education relative to GDP by levels (primary, secondary, and tertiary) in the Czech Republic from 1998 till 2017

Figure 1 shows that secondary education receives more funding than the primary and university levels. For instance, the expenditure relative to GDP at the secondary level in 1998 was 1.75%. The primary and tertiary were 0.62 and 0.68 respectively. The trend shows that from 1998 to 2017, funding for the secondary level exceeded all the levels, which is well shown in the figure above. The figure further demonstrates that from 1998 to 2015, the university level has been getting more funding than the primary level. It was only in 2016 and 2017 that funding for primary education was more than for university education. The revealed trends show that the Czech government attaches more importance to the secondary level of education than the primary level. This may be because secondary education serves as a transition into the higher level of education and the labor needs of the economy. The government, therefore, invests more money into secondary and university education to increase access and quality to produce graduates who will be better fitted into the various sectors of the economy. The low funding at the primary level could also be a result of lower revenues obtained at the municipal levels and the increase in the operational costs due to the rise in inflation. The two levels of local government are very different. Having seen the government expenditure on education from the gross domestic product, it will be beneficial to know how much is spent on each student at the various levels of education.

3.2. The educational expenditure per student by the level of education

The government expenditure per student by level in each year in the Czech Republic was below the OECD average in 2016 for all three levels of education. The largest gap was at the tertiary level, where spending per student was USD 7 6121 compared to USD 10 502 on average for OECD countries. Table 2 and Figure 2 present the educational expenditure per student by the level of education. In OECD countries, overall expenditure per student on educational institutions from primary to tertiary levels averages 26% of per capita GDP, broken down into 22% at the primary level, 25% at the lower secondary level, 26% at the upper secondary level, and 39% at the tertiary level. Evidence from data suggests that the expenditure per student in Czech over the years has been lower than OECD standards, with the expenditure per student for primary education being lower than both the secondary and tertiary levels. In 1998, the expenditure per student at the primary educational level was 9.66. It increased to 15.05 in 2009. However, the expenditure marginally declined to 14.87 in 2017. Secondary education spending increased steadily from 18.87 in 1998 to 23.49 in 2017. The expenditure per student at the tertiary level saw a decline from 32.57 in 1998 to 24.82 in 2006. The year 2007 recorded the highest expenditure per student at 34.1 for the tertiary level. This declined to 21.64 in 2017.

Table 2: Educational Expenditure per student by level of education

Year	Primary	Secondary	Tertiary
1998	9.66	18.87	32.57
1999	10.38	20.1	31.3
2000	10.56	19.45	28.01
2001	10.18	19.17	28.48
2002	10.79	20.6	28.12
2003	11.69	21.3	30.49
2004	11.63	21.13	27.61
2005	11.47	20.9	24.82
2006	12.38	21.1	34.1
2007	11.95	20.2	27.96
2008	12.43	20.8	23.49
2009	15.05	23.27	24.27
2010	14.86	23.27	21.94
2011	15.41	23.84	25.92
2012	15.7	24.15	24.25
2013	15.34	23.74	21.76
2014	15.11	23.54	20.5
2015	14.95	23.67	20.99
2016	13.87	22.3	20.34
2017	14.87	23.49	21.64

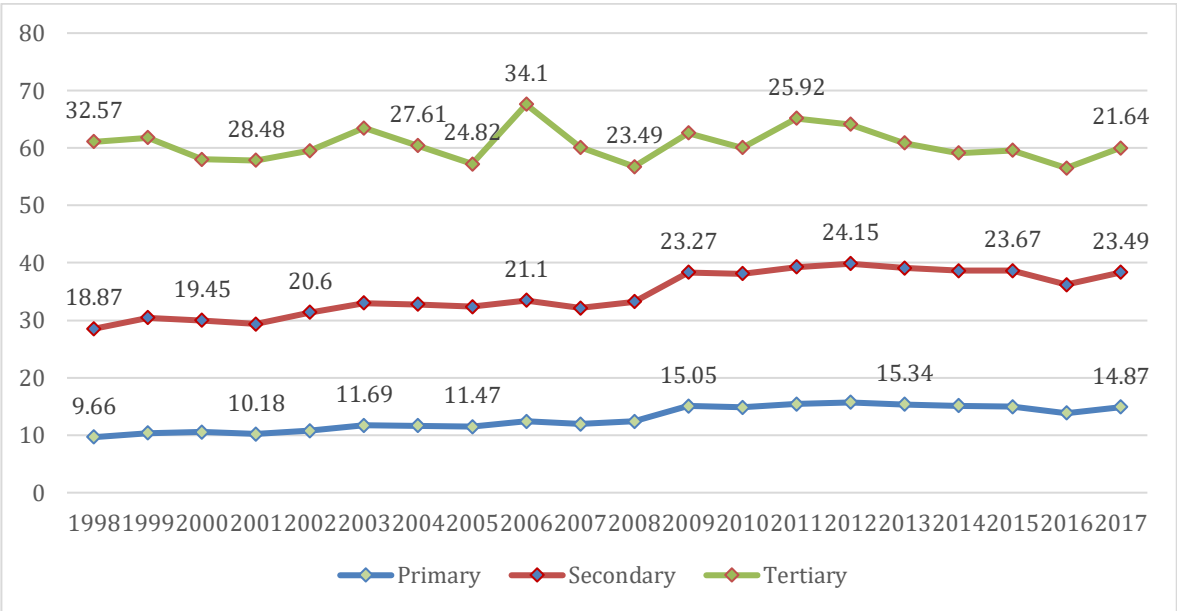

Figure 2: Educational expenditure per student by levels

Table 3: Gross Enrollment ratios by educational level

Year	Primary Enrollment	Secondary Enrollment	Tertiary
1998	103.09	82.16	23.7
1999	103.03	82.96	25.5
2000	103.34	88.32	28.3
2001	103.42	94.81	30
2002	101.55	95.5	34.4
2003	99.03	96.49	37
2004	98.6	95.44	43.7
2005	99.21	95.67	48.3
2006	100	96.04	50.1
2007	103.19	94.96	54.2
2008	105.73	94.15	58.1
2009	105.97	93.85	61.1
2010	103.8	94.66	63.9
2011	100.76	95.8	65.6
2012	99.37	96.79	65.7
2013	98.74	104	65.1
2014	98.67	104.7	65.6
2015	99.52	105.09	64.5
2016	100.21	104.63	63.7
2017	100.67	103.49	64.1
2018	100.51	102.3	63.8

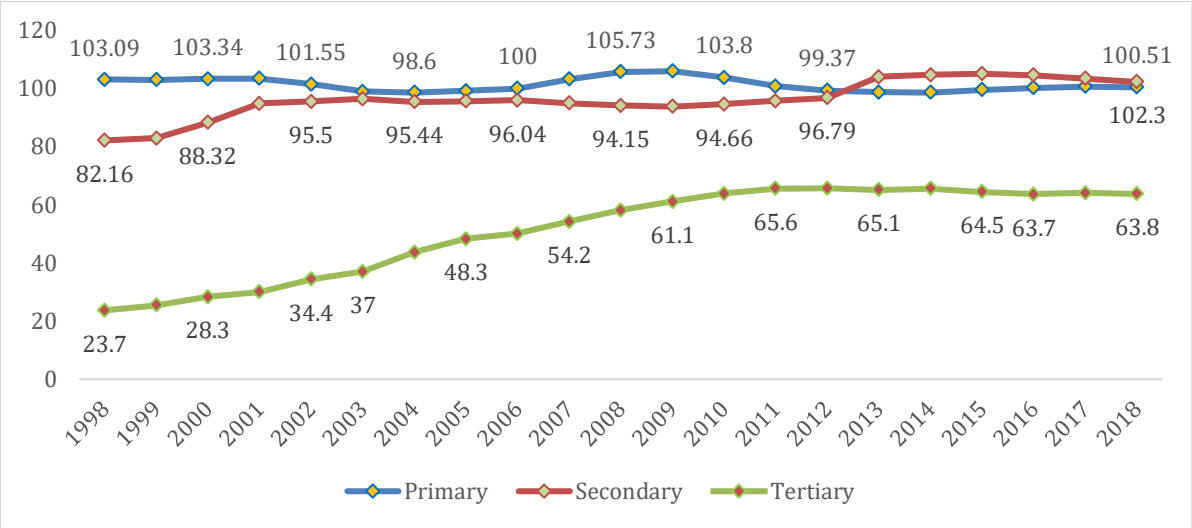

Figure 3: Gross Enrollment ratios by educational level

Figure 3 presents the gross enrolment ratios by levels of education. There has been a substantial increase in the gross enrolment ratios for the tertiary level from 23.7 in 1998 to 65.6 in 2011. Table 3 shows the gross enrolment ratios for each level. There has, however, been a slight decline in the tertiary level gross enrolment from 65.7 in 2012 to 63.8 in 2018. The annual gross enrolment ratio for secondary school has risen from 82.16 in 1998 to 95.5 in 2002. There has since been a gradual increase of 5.8% in the secondary level annual gross enrolment, from 96.04 in 2007 to 102.3 in 2018. For the primary level, no significant increases were observed over the years. The gross enrolment ratio was 103.09 in 1998, and it increased marginally to 105.73 in 2008.further reduced by 4.9% from 2008 to 2018.

4. Discussion

Taking into consideration the clear evidence from the results indicated above, we can logically conclude that the government of the Czech decentralized funding system for education, even though its expenditure on education falls below an average of 5% of the OECD standard across all the years from 1998 to 2017, had a significant impact on enrolment of both boys and girls at the secondary and tertiary levels of education. This corresponds with the conclusion of earlier empirical research carried out by Dynarski & Scott-Clayton, 2013; Solis, 2017; Meneses & Blanco, 2010; Castleman & Long, 2016; Hossler, 2000 & Singell, 2004). The research paper, therefore, recommends that the Czech government should find other sources of revenue to increase the country's gross domestic product so that a larger percentage of the GDP could be used to fund all the levels of education to achieve a high gross enrolment ratio at the primary, secondary, and tertiary levels and achieve the country's aim of raising public expenditure on education to 6% of GDP.

With regards to the primary level, no significant increases were observed over the years. The gross enrolment ratio was 103.09 in 1998, which marginally increased to 105.73 in 2008. It was further reduced by 4.9% from 2008 to 2018. The decrease in enrolment ratios from 2008 to 2018 could be attributed to the evidence shown in the data that the primary level receives fewer funds over the year as compared to the secondary and the university level.

5. Conclusion

The paper examines the trends in the Czech Republic's government expenditure on education from the years 1998 to 2017 and its impact on gross enrolment by educational level for the period under study. The paper reveals the decentralized system is used to fund education in the country where the central government takes the direct cost by giving grants and the regional government pays for the operational cost of education. The value-added tax policy is used to draw taxes from the public, which forms a percentage of the total expenditure on education for the operational cost. The findings further reveal that the Czech government's gross expenditure on education as a whole increased steadily over the years, even though it has been below the average standard of 5% of the OECD

for the period of study. There has been a decline in expenditure at some of the levels. For instance, there was a decline in the expenditure at the tertiary level from 32.57 in 1998 to 24.82 in 2006, which further declined from 2007 to 2017. Surprisingly, the decrease in tertiary expenditure had no significant impact on gross enrolment ratios during this time period. Funding at the secondary and tertiary levels has been higher from 1998 to 2017, which translated to a marginal increase in the expenditure per student at the secondary and tertiary levels, which further translated to an increase in the enrolment ratios at these levels. As a whole, the secondary level has received more funding over the years than the other levels of education in the Czech Republic.

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