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Externalities on the Labor Market**

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ABSTRACT

Educational Reforms and Their Positive Externalities on the Labor Market

Educational reforms aim to improve education quality and accessibility, creating positive externalities like individual growth and societal benefits. Although the global educational attainment has progressed, disparities still exist. This study applies the four-cell matrix developed by Münich and Psacharopoulos (2018) as analytical framework to classify the benefits of schooling into four different quadrants. It distinguishes between private and social benefits on the x-axis and market and non-market benefits on the y-axis. The survey finds that educational reforms and policies significantly impact society's development and progress, improving economic growth, social mobility, and health outcomes. By and large, the investigated reforms vary by country and education level, with some focusing on primary education and access to education while others focus more on tertiary education. The findings reveal that large differences exist in how far certain reforms were already implemented. Developing nations mainly experience non-market benefits like improved health and disease reduction, while developed countries show positive externalities in market and non-market areas. Reforms targeting tertiary education often translate into more positive externalities in the two private quadrants.

JEL Classification: I0, J6, O1, N3

Keywords: educational reforms, market benefits, non-market benefits, private benefits, social benefits

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1. Introduction

There is little doubt that education has positive effects on the individual (Weale, 1992), and by now it is widely accepted that education has also numerous societal benefits (Münich & Psacharopoulos, 2018). Worldwide, there has been significant progress in educational attainment over the past few decades. However, disparities still exist between countries and regions (Lee & Barro, 2013).

Educational attainment creates positive externalities (Münich & Psacharopoulos, 2018). In general, a positive externality is a profit received from an economic agent's consumption or production of a good or service that benefits others (Hall, 2006; Bertolin, 2018) According to McMahon (1987) the external benefits of education are those that benefit society in addition to the private benefits experienced by the individual decision maker, that is, the student and the family.

Hall (2006) classifies the positive externalities into two types. First in *Civic Engagement and Democracy*. It is generally accepted that education is a crucial element of a healthy democratic society because it motivates citizens to take part in democratic processes and equips them to do so in a knowledgeable manner. The other type is *Economic Growth*. Accordingly, education boosts not only the productivity of the person receiving education but also the productivity of his coworkers.

To gain from these positive externalities and also due to international comparisons, countries all over the world are investing in educational policies and reforms (Baker & Wiseman, 2005). Napier (2005) states that depending on the development stage of a country or region, governments struggle to implement educational policies and reforms. According to Lewin (2007), there were numerous reasons for the disappointing progress, including some governments' unwillingness to make commitments to prioritize expanded enrolment a reality, real resource constraints, capacity, and teacher supply bottlenecks, and difficulties in converting promises of external support into expanded external assistance. But not only low-income countries struggle with educational policymaking. Lack of resources (Woessmann & Hanushek, 2007), resistance from stakeholders (Cuban & Tyack, 1997), poor implementation due to inadequate planning, lack of clarity, or insufficient support for educators (Datnow, 2005), and misalignments with the local context (Baker & Wiseman, 2005) are issues that all nations, regardless of their development stage, are facing.

In the context of educational reforms and their positive externalities, this study aims to explore the following research questions:

1. *What are the main positive externalities of educational reforms and policymaking?*
2. *What kind of differences regarding the level of development exist?*
3. *Do the results allow to share a best practice of educational reforms for policymaking?*

2. Literature Review

EENEE is a network of eminent European institutions and specialists in educational economics. The European think tank is sponsored by the European Commission, Directorate General Education and Culture (DG EAC), and coordinated by the Centre for European Policy Studies (CEPS) and the ifo Institute. It was established in 2006 to improve the decision-making and policy development in education and training in Europe. They do so by providing guidance and assistance to the European Commission in its analysis of the economic implications of educational reforms and policies. In addition to providing policymakers, journalists, and other individuals interested in the economics of education in Europe with a readily accessible information source, EENEE is committed to developing a platform for exchange for education economists in Europe (EENEE, n.d.). Up to four analytical reports are written by the EENEE each year on behalf of the European Commission. The Analytical Reports focus on providing an overview of the existing literature and critically evaluating the findings as they each address a specific issue in the field of the economics of education. (EENEE, n.d.)

In February 2018, Daniel Münich and Deorge Psacharopoulos (2018), two economics professors, published one of the above-mentioned analytical reports with the title *Education externalities - What they are and what we know*. The report examines empirical studies that attempted to quantify the external and non-market effects of schooling and concludes that these effects are substantial. They state that a comprehensive cost-benefit analysis of education is important because it allows for the potential reversal of policy decisions, such as the subsidization of a particular degree or type of education whose social benefits outweigh the cost of provision. In their report, they classified the benefits of schooling into a four-cell matrix as shown in Table 1.

The benefits that are easiest to document are those in the northwest quadrant, namely private benefits that present themselves in the labor market and can be measured in monetary terms. Those in the southeast quadrant are the most difficult to document, particularly social benefits that cannot be clearly viewed or evaluated in monetary terms.

Table 1: Basic taxonomy of educational benefits

| Benefit Type | Private | Social |
|-------------------|---|--|
| Market | <ul style="list-style-type: none"> - Improved employability - Higher earnings - Less unemployment - Increased labour market flexibility - Greater mobility | <ul style="list-style-type: none"> - Higher productivity of others - Higher net tax revenue (saving taxpayers' money) - Less reliance on government financial support (saving taxpayers' money) |
| Non-Market | <ul style="list-style-type: none"> - Greater consumer efficiency - Better personal and family health - Better health and skills of children | <ul style="list-style-type: none"> - Reduced crime (affecting others) - Less spread of infectious diseases (to others) - Lower fertility rates - Better social cohesion - Increased voter participation |

Source: Münch and Psacharopoulos (2018)

As the winds of change sweep across the global landscape, the necessity for continuous adaptation and progress has never been more apparent. In this chapter, reforms and policies will be introduced and comprehensively explored. An overview of their respective key objectives and the actions taken to achieve those objectives will be given. As this paper aims to look at the global stage of education, every continent was being investigated. The two most populous countries from each continent were then selected. The rationale behind selecting the two most populous countries from each continent for this paper lies in the profound impact these nations have on their respective regions and the world at large. Focusing on these demographic giants aimed to capture a comprehensive and representative understanding of the diverse social, economic, political, and cultural forces shaping each continent. These countries not only wield considerable influence in regional and global affairs but also serve as vital engines of growth and development.

Europe

Germany

The educational reform investigated in Germany is the Bologna Process. The Ministers of Education of four significant EU member states released a declaration in May 1998 with the goal of fostering greater collaboration and mobility among European universities. The Sorbonne University in Paris, where it was released at a celebration, is where this declaration gets its moniker. In a follow-up conference held in Bologna in June 1999, the ministers of education from 29 European nations released a joint statement titled "The European Higher Education Area." The 29 European nations (15 EU and 14 non-EU members) committed to achieving the establishment of a "European Area of Higher Education" as a crucial means of fostering citizen mobility and employability as well as the continent's overall growth (Reinalda, 2008; Dyrenfurth & Murphy, 2006). Table 2 shows the key objectives of the Bologna Process and actions taken.

Table 2: Bologna Process: Key Objectives and Actions Taken

| Objectives | Actions |
|--|---|
| Adoption of a system of easily readable and comparable degrees. | Through the implementation of the Diploma Supplement |
| Adoption of a system essentially based on two main cycles, undergraduate and graduate. | Successful completion of a three-year first cycle study grants access to the second cycle, with reforms focused on outcome-based awards, notably the Dublin Descriptors from 2004. The first cycle degree qualifies for the European labour market, leading to master's or doctorate degrees in the second cycle. |
| Establishment of a system of credits | Establishing the European Credit Transfer and Accumulation System (ECTS) |
| Promotion of mobility for students, teachers, researchers, and administrative staff | Establishing the Erasmus+ Program |
| Promotion of European co-operation in quality assurance. | Establishing the European Quality Assurance Register (EQAR) European Standards and Guidelines for Quality Assurance of Higher Education (ESG) |

| | |
|---|---|
| Promotion of the necessary European dimensions in higher education. | Founding the European Higher Education Area (EHEA) Establishing the 'European Universities' Initiative |
|---|---|

Source: EHEA (n.d.); Dyrenfurth and Murphy (2006); European Commission (n.d.)

United Kingdom

The goal of developing a *world-class education system* has been the main focus of English educational policy since 1997 (Wyse, 2003). The National Literacy Strategy (NLS) was established in 1997 by the UK government and implemented in 1998 to improve literacy levels over a five-to-ten-year period. Countries not affected by the NLS were Scotland, Wales, and Northern Ireland because they follow their own curricula. David Blunkett, the Shadow Secretary of State for Education and Employment established the Literacy Task Force in May 1996 which released two reports: an initial report in August 1997 and a preliminary consultation report in February 1997. The Task Force outlined the specifics of a "steady, consistent strategy" for boosting literacy levels that could be sustained over time and be made a top priority for the education service as a whole in its final report (Beard, 2000). The main target of the NLS was that by 2002, 80% of 11 year olds should reach the standard expected for their age in English (i.e. Level 4) in the Key Stage 2 National Curriculum tests (Stannard & Huxford, 2007). To achieve this target the Literacy Task Force elaborated other objectives as seen in Table 3.

Table 3: The National Literacy Strategy: Key Objectives and Actions Taken

| Objectives | Actions |
|------------------------------------|---|
| Providing a structured framework. | <i>Framework for Teaching</i> sent to all primary schools which: <ul style="list-style-type: none"> - establishes termly teaching goals for the age group of 5 to 11 - provides a practical structure of time and class management for a daily Literacy Hour. |
| Provide a structured daily lesson. | Literacy Hour, a daily hour-long lesson that incorporated whole-class teaching, group work, and independent activities to ensure effective literacy instruction. |

| | |
|---|--|
| Support teacher professional development. | A professional development program centered on a Literacy Training Pack for all elementary teachers. The materials in this pack include course booklets, overhead transparencies, audio, and videotapes. |
|---|--|

Source: Wyse (2003); Beard (2000); Stannard and Huxford (2007)

Americas

The United States of America

In January 2002, President George W. Bush signed The No Child Left Behind (NCLB) Act. It is arguably the most far-reaching education policy initiative in the United States over the last four decades. It dramatically expanded federal influence over the nation’s more than 90,000 public schools (Dee & Jacob, 2011; Heise, 2017). In his desktop reference, Ohnemus (2002) states that the NCLB is a turning point in educational reform that aims to raise student success and transform school culture in America. According to the U.S. Department on Education (2004), the NCLB is based on four pillars: (1) Stronger accountability for results, (2) more freedom for states and communities, (3) proven education methods, and (4) more choices for parents. The act also places an increased emphasis on reading, especially for younger pupils, enhancing the quality of the teachers and that all children in America’s schools learn English. The act consists of ten titles see Appendix 1. The objectives below those pillars and their respective actions are represented in Table 4.

Table 4: No Child left Behind Act: Key Objectives and Actions Taken

| Objectives | Actions |
|---|---|
| Accountability for Results | <p>Creation of assessments in each state that measure what children know and learn in reading and math in grades 3-8.</p> <p>Annual school report cards for comparative information on the quality of schools.</p> <p>Statewide reports with performance data disaggregated for students by poverty levels, race, ethnicities, disabilities, and limited English proficiencies.</p> |
| Creating Flexibility at the State and Local Levels and Reducing Red Tape | <p>Most local school districts in America can transfer up to 50 percent of the federal dollars they receive among several education programs without separate approval.</p> <p>All 50 states can transfer up to 50 percent of the non-Title I state activity funds they receive from the federal government among an assortment of ESEA programs without advance approval.</p> <p>Creation of up to 150 local flexibility demonstration projects.</p> |
| Enhanced Parental Choice for Parents of Children from Disadvantaged Backgrounds | <p>Public School Choice</p> <p>Supplemental Services: Federal Title I funds (approximately \$500 to \$1,000 per child) can be used to provide supplemental educational service</p> <p>Increased federal support for charter schools</p> |
| Strengthening Teacher Quality | <p>Consolidation of smaller programs within the US Department of Education.</p> <p>In addition to specific funds for teacher quality, H.R. 1 will also give local schools new freedom to make spending decisions with up to 50 percent of the non-Title I federal funds they receive.</p> |
| Focuses on What Works | <p>Federal Funding targeted to support effective programs and teaching methods that improve student learning and achievement.</p> |

Source: Ohnemus (2002); U.S. Department of Education (2003)

Brazil

Brazil is a federal nation with a fragmented educational system and unequal funding for subnational governments. This implies that funding for education is also unequal (Soares, 1998). Regarding enrollment rates for primary and lower-secondary education, Brazil had long trailed behind other middle-income nations (de Mello & Hoppe, 2005). To tackle these inequalities, the Brazilian government created the Fund for the Maintenance and Development of Primary Education and Valorization of Teachers (FUNDEF) in 1996 and implemented in 1998 (Soares, 1998). Through FUNDEF, a national minimum was established for government expenditure on primary and lower-secondary education at all levels of government. States and local governments who are unable to afford the national expenditure floor must have the federal government supplement their spending (de Mello & Hoppe, 2005). States, municipalities, and federal unions' responsibilities were reorganized toward basic education by FUNDEF (Silveira, 2021). FUNDEF is supported by designated funds (See Appendix 2). The Fund is composed of 15% of all ICMS collection and constitutional transfers in any given state (Soares, 1998). The constitutional transfers comprise the Municipal Participation Fund (FPM) and the State Participation Fund (FPE) (Ter-Minassian, 2012). FUNDEF's objectives and their respective actions are shown in Table 4.

Table 5: FUNDEF: Key Objectives and Actions Taken

| Objectives | Actions |
|---|--|
| Access to quality elementary education for all Brazilian students | National Minimum Expenditure of R\$300 per student and if not reached the Federal Government must complement that states fund. |
| Promoting a more equitable distribution of financial resources among schools and regions. | The grant will be distributed proportionally to the number of students in each local education system and equally to each state. |
| Improving Teacher Quality | At least 60 percent of the fund must be spent on teachers' compensation. |

Source: Soares (1998); de Mello & Hoppe (2005)

Asia

China

After New China was founded in 1949, the Chinese people soon started to adapt their educational theories and systems to the ones of the Soviet Union (Li, 2001). Besides minor changes, there were no tremendous reforms or great advancements up until the late 1990's. As soon as the Zhu Administration was established on March 19, 1998, Zhu announced the creation of the "State Sciences and Education Leading Group," a unique cross-ministry leadership body, with the purpose of carrying out the plans for revitalizing China through science and education (Li, 2004) and having a strong commitment to develop the nation and equip its citizens to handle the confrontations of the market's globalization (Mok & Jiang, 2016). This growing economic globalization, IT development, and adoption of market-oriented processes are all having a huge impact on how internationally diverse higher education is becoming in many different nations, including China (Huang, 2007). At its first meeting on June 9, 1998, this group decided to significantly increase the scientific and educational input and demanded that the Ministry of Education (MOE) develop an action plan for educational reforms running from that time until 2010 (Li, 2004).

On February 24, 1999, the MOE answered with the promulgation of the *Action Scheme for Invigorating Education Towards the 21st Century*. The Action Scheme outlined the goals for the development of higher education in China from 2000 to 2010 and served as a roadmap for century-long educational reform and development in China (Yang, 2005; Ministry of Education, 1998). The Action Scheme comprises four central aspects of the higher education reform: (1) structural reform, (2) institutional autonomy, (3) the 211 Project and the 985 Project, and (4) enrollment expansion (Yang, 2005). The Ministry of Education (1998) aims for an enrollment rate of 11% of higher education for 18-22-year-olds by 2000 and 15% by the year 2010 (Ministry of Education, 1998). Further objectives whose actions also contributed to the expansion of the enrollment rate are displayed in Table 6.

Table 6: Higher Education Reform: Key Objectives and Actions Taken

| Objectives | Actions |
|---|---|
| Structural Reform to reduce single disciplinary higher education institutions and professional higher education institutions. | From 1993-2002, 597 higher education institutions (HEI) have been merged into 267 HEI, 305 HEI were directed by central ministries to shift into provincial governments' hands and 55 HEI to the MOE's hand. A new two-level management system consisting of central and local governments has taken shape |
| More Authority to the Universities | Enactment of Higher Education Law of the PRC: |
| Improve Higher Education Quality in Teaching and Research | <p>Maintaining and advancing the "211 Project" to Improve HEIs' Knowledge Innovation Capabilities. Launched in 1995, the 211 Project focuses on the development of several higher education institutions and fields of study.</p> <p>The "985 Project", which was launched in 1998, focuses on the priority development of several institutions and important disciplines of study in order to elevate them to the level of world-class universities.</p> |

Source: Li (2004); Ministry of Education (1998); Yang (2005)

India

India is a country with a colorful past, a remarkably diverse population, and a dedication to democracy and the well-being of everyone. Since Parliament established the National Policy on Education in 1986, attempts to revamp the curriculum have been concentrated on developing a national system of education (NCERT, 2005). Batra (2005) states that access to education, a suitable teaching-learning environment, an appropriate school curriculum, and an empowered and inclusive teaching community are four essential criteria for a school system that strives to facilitate social transformation. While educational reform has been heavily focused on the first two factors since the 1980s, the late 1990s brought the function of the curriculum into the national spotlight. During the NDA government, the National Council of Education and Research Training (NCERT) established a curriculum framework, which, along with several of NCERT's textbooks, drew much criticism (Ganesh, 2005; Batra, 2005). Following the change in national government in 2004, the NCERT curriculum was reviewed in 2005 (Batra, 2006).

The Sarva Shiksha Abhiyan (SSA), an initiative for Universal Elementary Education, encourages curriculum decentralization for greater uniqueness to the local situation. That is exactly what the National Curriculum Framework 2005 (NCF-2005) tries to do (Saha, 2016). The NCF-2005 resulted in a series of efforts at the state level for the renewal of school education curriculum, modification of textbooks and other teaching-learning materials, improvements in pedagogy, and learning evaluation methods (NUEPA, 2014). The key objectives and the respective actions of the NCF-2005 are displayed in Table 7.

Table 7: National Curriculum Framework 2005: Key Objectives and Actions Taken

| Objectives | Actions |
|---|--|
| Child-centered and constructivist approach | Revision of Textbooks and the national curriculum |
| Teacher and Education Training | Revision of teacher education curriculum Introduction of the two-year B.Ed. program Strengthening teacher education institutions Launching in-service teacher programs such as SSA and RMSA |
| Integration of Information and Communication Technology (ICT) | The government launched various initiatives to promote the integration of ICT in education, such as the establishment of computer labs in schools and the development of e-learning resources. |
| Learning without burden | Various Examination Reforms and more flexibility in assessment |
| More Inclusiveness | The government introduced policies to promote inclusiveness and equity in education, such as the Right to Education Act (2009), which guarantees free and compulsory education for children aged 6-14 years. |

Source: Saha (2016); NCERT (2005); Ministry of Law and Justice (2009); NUEPA (2014)

Africa

Nigeria

The educational reform investigated in Nigeria is the Universal Basic Education (UBE). President Olusegun Obasanjo started Nigeria's UBE program on September 29, 1999, in Sokoto. The National Assembly passed and adopted the compulsory and free universal basic education bill (Osarenren-Osaghae & Irabor, 2018). In April 2004, the UBE Act was signed, and the UBE program officially began. However, the implementation officially began in July 2005 when the UBE cash was appropriated to the Commission and then distributed to States (UBEC, FAQ's, n.d.).

Prior to the implementation of the UBE program, it was discovered that the government's current educational policy and program resulted in distortions, a high dropout rate, a restricted curriculum, and graduates who were only partially prepared to satisfy the needs of society (Anaduaka & Okafor, 2013). In order to solve these issues, the UBE program was established, which offers free, universal, and required basic education to all students, regardless of their sex, age, ethnicity, religion, language, or socioeconomic situation. (Unagha, 2008; Anaduaka & Okafor, 2013). Additionally, it will house a comprehensive adult literacy program. The program is consequently created to guarantee a sufficient and high-quality education that is focused on achieving the goals of the country (Anaduaka & Okafor, 2013).

In 2004, Universal Basic Education Commission (UBEC) developed a *Standard Action Plan* to ensure the Commission's activity program is carried out successfully (UBEC, 2005). Table 8 displays the key objectives of the UBE and the main actions taken.

Table 8: Universal Basic Education: Key Objectives and Actions Taken

| Objectives | Actions |
|--|--|
| Ensuring unrestricted access to nine years of basic education. | The Nigerian government established the UBE Act where they: |
| The provision of free, universal basic education to all Nigerian school-age children. | Created the UBEC is responsible for setting standards, monitoring progress, and providing technical support to states in the implementation of the UBE program |
| Reduce the rate of dropout from the formal school system through improving relevance, quality, and efficiency. | Set up the UBE Intervention Fund, which provides funding for basic education. The fund is derived from a 2% deduction of the total revenue accruing to the federal government. |

| | |
|--|--|
| Assuring the development of sufficient levels of literacy, numeracy, manipulative, communication, and life skills, as well as the ethical, moral, and civic values required for creating a firm basis for lifetime learning. | <p>Developed strategic partnerships with organisations like UNICEF and the World Bank, as well as local NGOs, to implement the UBE reform.</p> <p>Instituted several teacher training programs to improve the quality of teaching and learning in schools. These programs are often conducted in partnership with international organizations and local institutions</p> <p>Embarked on numerous infrastructure development projects, including the construction of classrooms, provision of instructional materials, and development of ICT facilities, to enhance the learning environment</p> |
|--|--|

Sources: Anaduaka and Okafor (2013); Osarenren-Osaghae and Irabor (2018); Aja et al. (2018); Nigeria (2004)

Ethiopia

In Ethiopia, only around one out of every three children of primary school age attend primary school. In 1995/96, the gross enrollment ratio (GER) for Grades 1–8 was 30%. Only one out of every ten school-aged children attend secondary school, and university education is available to a much lower proportion of those who complete secondary school. Regional differences exist as well, with metropolitan areas having greater GER than less developed regions like Afar and Somalia (World Bank, 1998). According to Korcho (2013), low-quality education is strongly linked to early school dropout. The Government launched a series of political, economic, and social changes in an attempt to address the aforementioned problems, and it also developed a new Education and Training Policy and Strategy in 1994. The primary objective of the policy is to reform and broaden the educational system in ways that are closely related to the needs of the economy both now and in the future. (World Bank, 1998). To achieve the goals of the Education and Training Policy and Strategy, the first Education Sector Development Program (ESDP-I) was initiated in 1997/98 and concluded in July 2003 (Hailu, 2018). The objectives and respective actions taken in the ESDP-I are displayed in Table 9.

Table 9: Education Sector Development Program: Key Objectives and Actions Taken

| Objectives | Actions |
|--|--|
| Expand access to education with special emphasis on primary education in rural areas, raising enrollment from 3.1 million to 7 million, and increasing the primary enrollment ratio from 30% to 50%. | Increase the number of school buildings Strengthened institutional, organizational and individual capacities Empowered Regional and local structures and improved ownership |
| Improve equity by improving enrollment ratios for disadvantaged groups and increase girls' enrollment from 38% to 45% and increase rural relative to urban enrollment | Use local languages in the classroom Eliminating school fees |
| Improve efficiency of the education system by reducing dropout and repetition rates; | Allow children to progress between grades one and three without being held back on account of inadequate performance |
| Improve quality and relevance | Providing books, reducing the student to book ratio from 5:1 to 1:1 in core subjects and by curriculum improvements and teacher training. Developing context-appropriate primary school syllabi and textbooks Expand teacher training programs Working environment made more conducive to improved performance and education service delivery |
| Improve financing for education | Increasing public spending on education from 3.8% to 4.6% of GDP and facilitating private sector and community financing of education within the target of 5% of ESDP spending. |

Source: World Bank (1998); Hailu (2018)

Australia

The Australian Education Minister, Brendan Nelson launched a year-long study of tertiary education in 2002, titled Higher Education at the Crossroads. The policy statement resulting from the study was issued on May 13, 2003 called *Our Universities: Backing Australia's Future* (Nelson Report) (Duckett, 2004). In his report Nelson (2003) concludes that Australia's higher education has a great reputation both domestically and internationally. He also states that higher education faces new horizons and challenges and that the case for reform is clear. The review of the current higher education framework revealed issues such as increased course provision costs, the need for increased sector resources, duplication in some university activities and courses, non-completion of approximately 30% of students, and institutional over-enrollment (Raciti, 2010; Nelson, 2003). With the reforms proposed in Nelsons report the Australian higher education policy entered a new phase of development and indicate a shift toward a more assertive neoliberal agenda (Pick, 2006). According to Pick (2005), the Nelson Reforms are accelerating the reflexive modernization of Australia's higher education system by implementing neoliberal policies that stress individualism, marketization, and increasing competition. The package of reforms is underpinned by four key principles: (1) Sustainability, (2) Quality, (3) Equity and (4) Diversity (Nelson, 2003). Nelson (2003) states that the future path of higher education in Australia will be shaped by an integrated policy framework based on the four fundamental principles stated above. The key objectives of the Nelson Reform and their respective actions are displayed in Table 10.

Table 10: Nelson Reform: Key Objectives and Actions Taken

| Objectives | Actions |
|----------------------|--|
| Increase Funding | A new Commonwealth Grant Scheme (CGS) with new funding agreements. In numbers it's a \$A1.5b expansion in funding over four years. |
| Support for Students | Launching the Higher Education Loan Programme (HELP) with income contingent loans Loans will also be made available to students who pay full tuition at public and qualifying private higher education institutions (FEE-HELP). |

| | |
|---|--|
| | <p>A third loan scheme (OS-HELP) will be developed for students who want financial aid to study abroad.</p> <p>Commonwealth Learning Scholarships for educational and living expenses will also be available. Pupils from underprivileged groups, notably Indigenous pupils, will receive more assistance.</p> |
| Promoting excellence in learning and teaching | <p>Establishing the National Institute for Learning and Teaching in Higher Education</p> <p>New Australian Awards for University Teaching (\$)</p> <p>Establishing a Learning and Teaching Performance Fund of to reward those institutions that best demonstrate excellence in learning and teaching.</p> <p>Funding of so called Centres of Excellence which function as hubs for exchange and development in Australian higher education, drawing on international linkages and expertise</p> |
| Fostering Research Excellence | <p>The Government will establish a taskforce to develop a nationally integrated research infrastructure strategy</p> <p>A high level taskforce was established to examine scope for greater collaboration between universities and major Publicly Funded Research Agencies (PFRAs)</p> |
| Renewed Focus on Equity | <p>Increased funding for Indigenous support Fund</p> <p>Indigenous Staff Scholarships</p> <p>More assistance for students with disabilities</p> <p>Establishing an Indigenous Higher Education Advisory Council</p> |

Source: Nelson (2003); Duckett (2004)

The positive externalities of educational reforms have been a focus of significant research interest. Various researchers focused either in positive externalities as a whole like Daniel Münich and George Psacharopoulos in their EENEE Analytical Report No. 34 prepared for the European Commission or Walter W. McMahon, 2009, in his book *Higher Learning, Greater Good* where he emphasizes the nature, assessment, and valuation of higher education's private and social advantages. Other researchers laid their focus on specific externalities.

In 2015, Eric Hanushek and Ludger Woessmann released a seminal study titled *The Knowledge Capital of Nations: Education and the Economics of Growth* where they examined the relationship of education and economic growth. Andrew Eyles, Lee Elliot Major and Stephen Machin (2022) investigated social mobility in correlation with education in a Sutton Trust report. In 2006, David M. Cutler and Adriana Lleras-Muney investigated the connection between education and health in the NBER working paper series with their working paper *education and health: evaluating theories and evidence*. Lance Lochner and Enrico Moretti (2001) studied the effect of education on crime in their working paper *The effect of education on crime: Evidence from prison inmates, arrests, and self-reports*. In the book *Economics of Education* (2020) in chapter 8, Thomas S. Dee investigates in the correlation of education and civic engagement.

This is just a fraction of research conducted by experts all around the globe. Other externalities investigated are environmental awareness, social cohesion, interpersonal and soft skills among many more.

3. Methodology

Secondary data analysis will be performed using existing datasets, such as those from Organization for Economic Co-operation and Development (OECD), the World Bank, Eurostat, National Bureaus of Statistics of the respective countries, and Statista. For each educational reform and policy an excel sheet was prepared and with their respective externalities and numerous figures were created to display the development of various indicators. These datasets will provide valuable quantitative information.

By focusing on the two largest countries in each continent, the study may not capture the full diversity of education systems and reform approaches. Smaller countries' experiences, which may have undertaken creative reform techniques or experienced unique problems, may be underrepresented in the analysis. Furthermore, the selection of nations could be influenced by factors such as data availability and quality, or the prevalence of specific reform techniques in the literature.

The study's ability to capture the long-term effects of educational reforms on student achievements, social justice, and economic growth may be limited by investigating reforms around the millennium.

Educational reforms frequently take time to implement and may have delayed or changing consequences that are not entirely visible within the time range chosen.

Furthermore, limiting the study to the millennium period may remove more current reform initiatives and policy developments that may be relevant to the research objectives.

The study may have substantial limitations due to data availability and quality, particularly when comparing countries across continents. Differences in data collection methods, terminology, and reporting standards might impede data comparability and contribute to measurement inaccuracies. Furthermore, data gaps or inconsistencies may have an impact on the validity and trustworthiness of the study's conclusions.

Establishing causal relationships between educational reforms and their positive externalities can be challenging due to the potential presence of endogeneity and omitted variable bias. Unobserved factors or reverse causality may confound the relationships under investigation.

4. Results

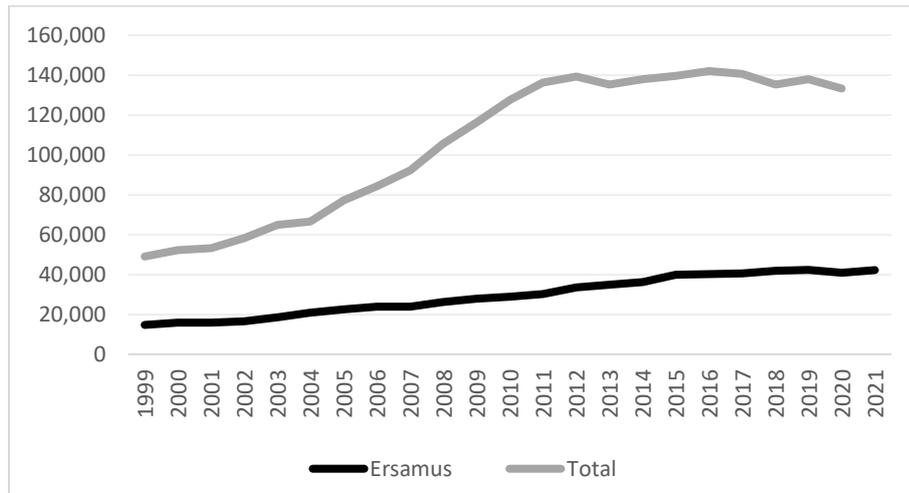
Europe

Germany

Private – Market

Student mobility is a private-market externality which was looked into. Figure 1 shows the curves of Germans studying abroad, the total number and the ones in the Erasmus program. It shows a positive slope after the implementation of the Bologna Process in 1999. The number international tertiary students enrolled as a proportion of the total tertiary students enrolled in the destination (host) country also rose after a decline in 2005.

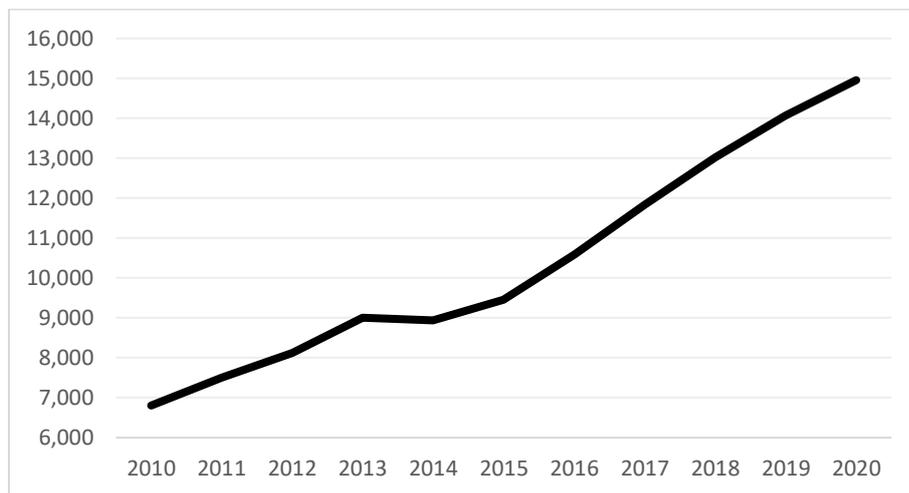
Figure 1: Germans studying abroad – Total and Erasmus



Source: Wissenschaft weltoffen (n.d.)

Not only did the mobility of the students increase, the international science staff at the four largest non-university research institutions also increased drastically from 2010 to 2020 as shown in Figure 2.

Figure 2: Number of international science staff at the four largest non-university research institutions: Germany



Source: Wissenschaft weltoffen (n.d.)

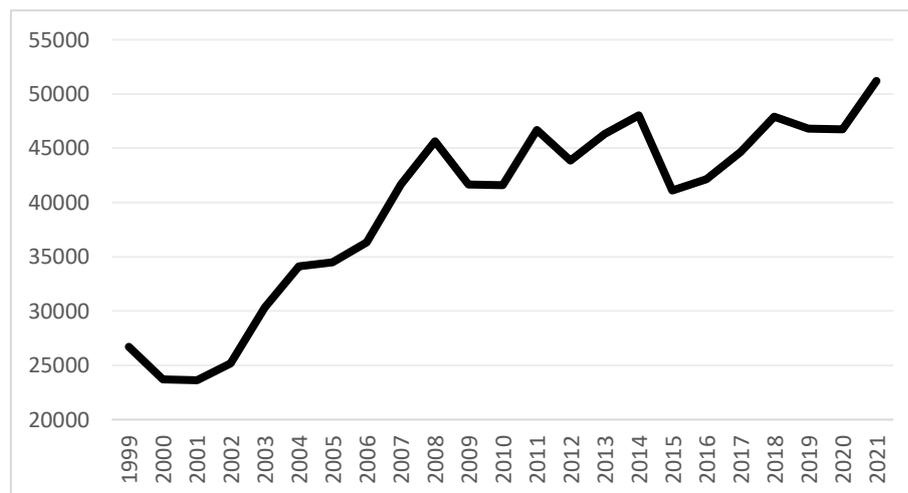
Additionally, to mobility, employability was analyzed. To measure employability, the total employment, employment rate by age group (25-54), employment rates by educational attainment and place of birth, and the employment rates of recent graduates were looked into.

The total employment (2005 - 2021) rose 10% and the employment rate by age group (25-54) (2005-2021) climbed from 77.4% to 84.5%. Employment rates by educational attainment and place of birth were distinguished between native-born and foreign-born and the educational attainment was tertiary. Between 2000 and 2015 the former rose 5.1 % whereas the latter rose 4% with a decrease between 2001 and 2005. The employment rates of recent graduates climbed from 86% in 2010 to 91.3% in 2021. Recent graduates were classified as people who finished upper secondary, post-secondary non-tertiary and tertiary education (levels 3-8) and are between 20 and 34 years old.

Social – Market

Economic Growth and Productivity are externalities than can put into the top-right quadrant of the four-cell matrix. Economic growth was analyzed with the GDP per Capita. Between 1999 and 2021, Germany’s GDP per Capita almost doubled as seen in Figure 3.

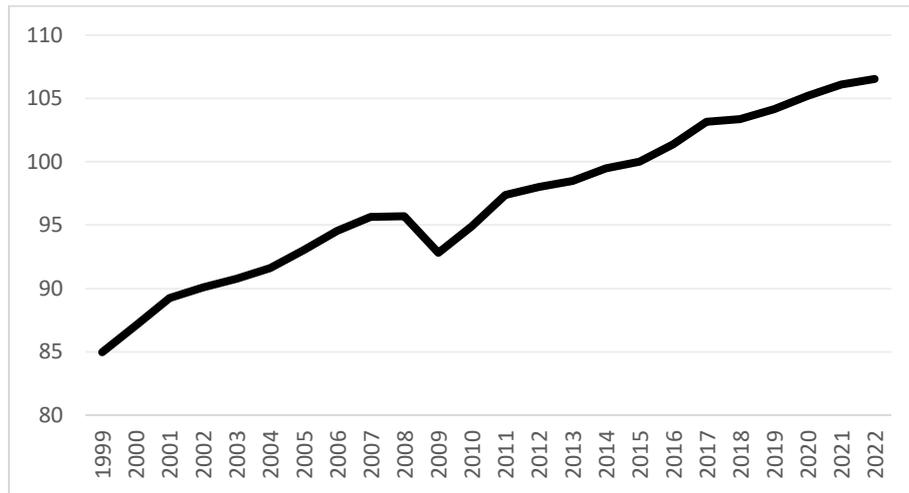
Figure 3: GDP per Capita in current US\$: Germany



Source: World Bank, 2023b

Productivity was measured in GDP per hour worked. It assesses how well labour input is coupled with other production parameters and employed in the manufacturing process (World Bank, 2023b). Between 1999 and 2021 it increased 25.39 percentage as displayed in Figure 4.

Figure 4: GDP per hour worked (Productivity) in current US\$: Germany

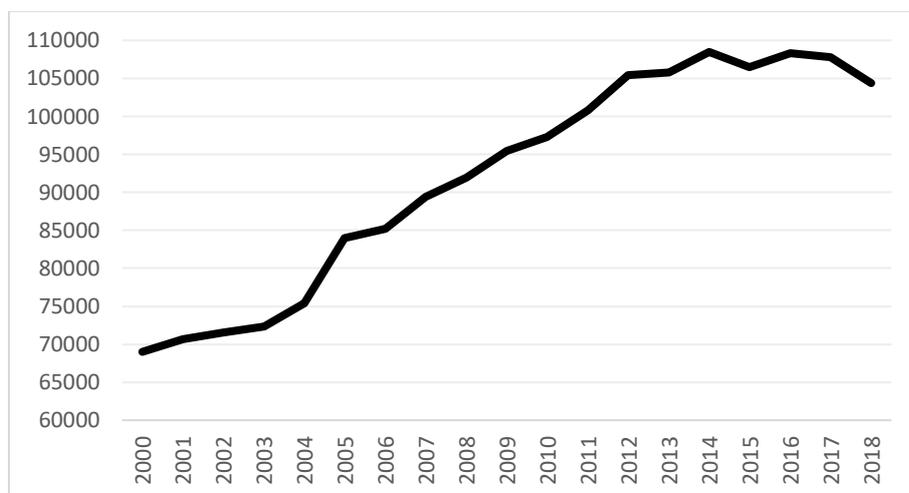


Source: OECD (2023i)

Private – Non-Market

For private – non-market externalities the number of scientific and technical journal articles and trademark applications were investigated. The number of scientific and technical journal articles refer to the number of scientific and engineering articles published in the following fields: physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering and technology, and earth and space sciences (World Bank, 2023b). The number increased constantly since 1999 with a slight decrease in 2015 and 2017 as shown in Figure 5.

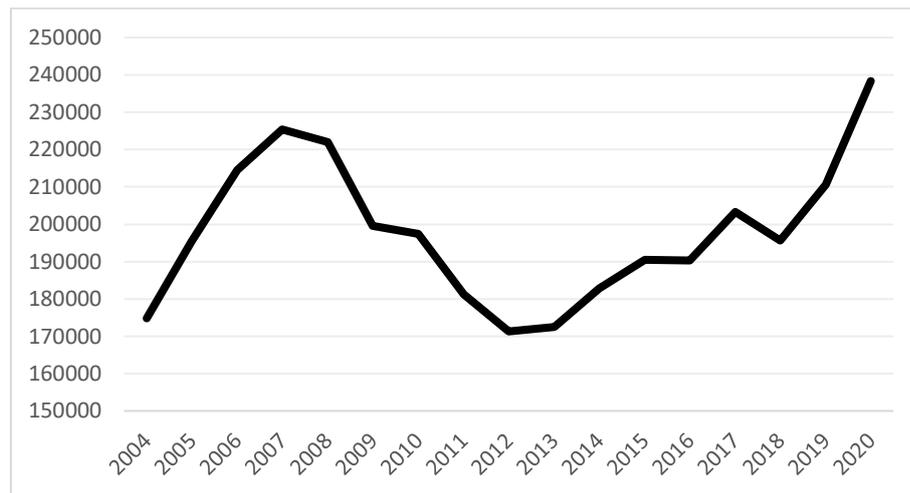
Figure 5: Number of Scientific and technical journal articles: Germany



Source: World Bank (2023b)

Additionally, Figure 6 shows the trademark applications. Only the trademark applications of German residents were included. From 2004 to 2008, there was an increase of 27%. This increase quickly fell again to the prior number until it rose again in 2012 and is now on a record number of around 24'000 trademark applications-

Figure 6: Trademark applications, resident, by count: Germany

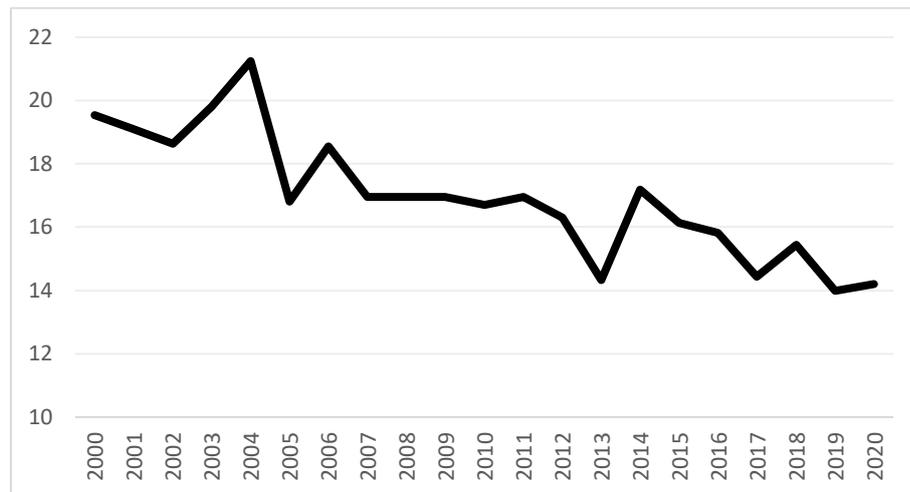


Source: World Bank (2023b)

Social – Non-Market

One could say that the increased mobility of students and academic personnel have fostered greater intercultural exchange and dialogue, promoting understanding among European nations. Additionally, to the greater intercultural exchange, which is hard to quantify, a greater social cohesion in Germany is a positive social – non-market externality. This was measured on the one hand with the wage gap between genders. The gender wage gap is defined as the difference between median earnings of men and women relative to median earnings of men (OECD, 2023j). The wage gap could be lowered since 1999 as shown in Figure 7.

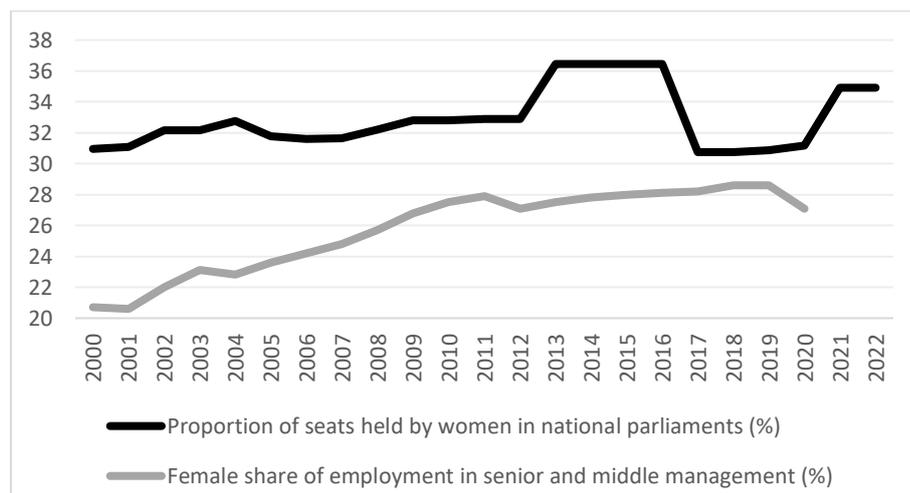
Figure 7: Gender wage gap: Germany



Source: OECD (2023j)

On the other hand, social cohesion was measured with the proportion of seats held by woman in national parliaments and with the female share of employment in senior and middle management. The former rose constantly from 1999 to 2012 with a jump into 2013, fell drastically in 2016 and is on the rise since then. The latter constantly improved since 1999 to 2019 with a slight decrease into 2020 (see Figure 8).

Figure 8: Proportion of seats held by woman in national parliaments and the female share of employment in senior and middle management: Germany



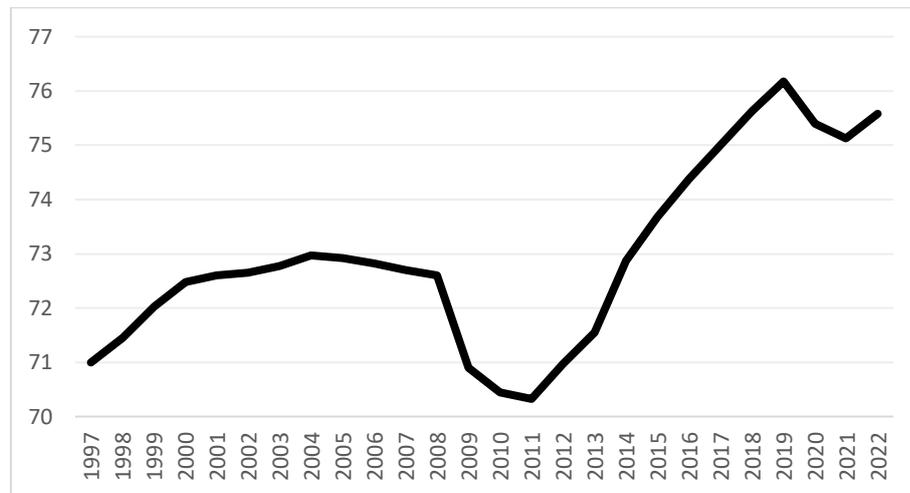
Source: World Bank (2023b)

United Kingdom

Private - Market

One of the positive private–market externalities investigated was again the employability measure with the employment rate. Figure 9 shows that the employment rate in the United Kingdom rose constantly until 2004, fell drastically in 2007 but started to recover again in 2011. The downfall is most possibly due to the global financial crisis.

Figure 9: Employment rate: United Kingdom

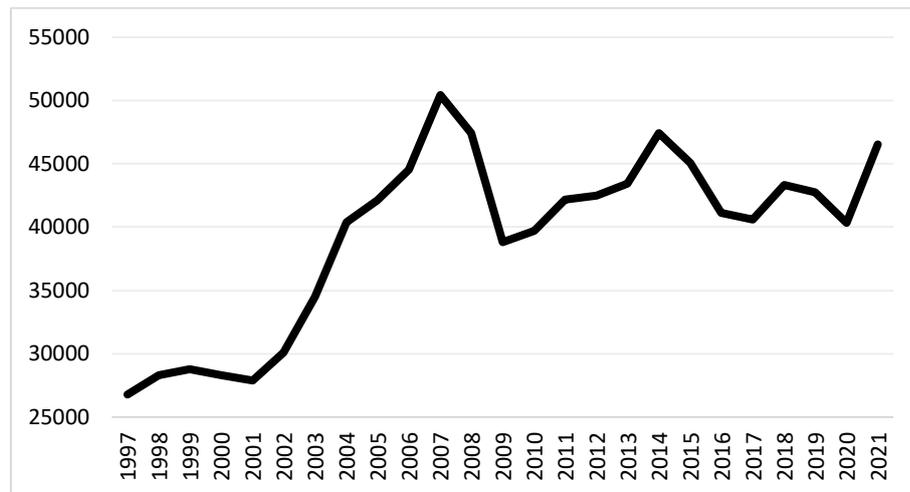


Source: OECD (2023c)

Social - Market

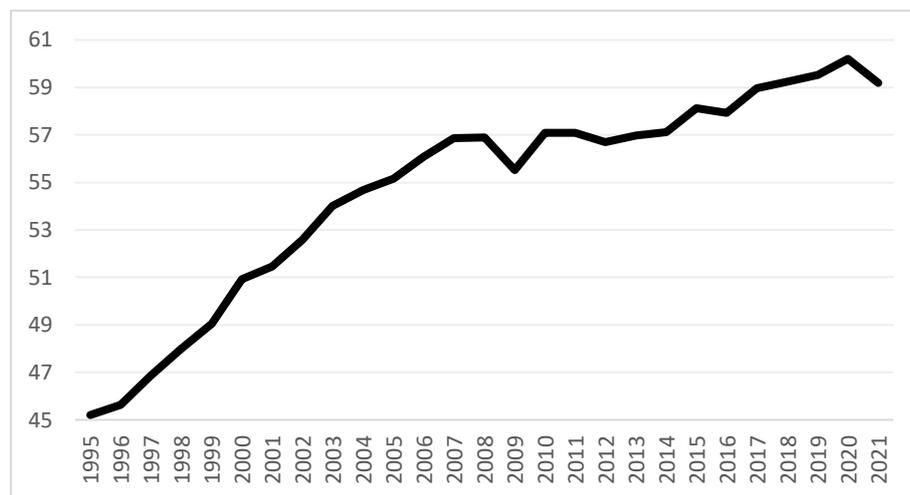
For the positive social-market externalities the economic growth and productivity were again chosen. Figure 10 shows the GDP per Capita (USD) increased by almost 75% since 1997. The productivity, which is again measured in GDP per hour worked (USD), increased 30.9% as shown in Figure 11.

Figure 10: GDP per Capita US\$: United Kingdom



Source: World Bank (2023b)

Figure 11: GDP per hour worked US\$: United Kingdom



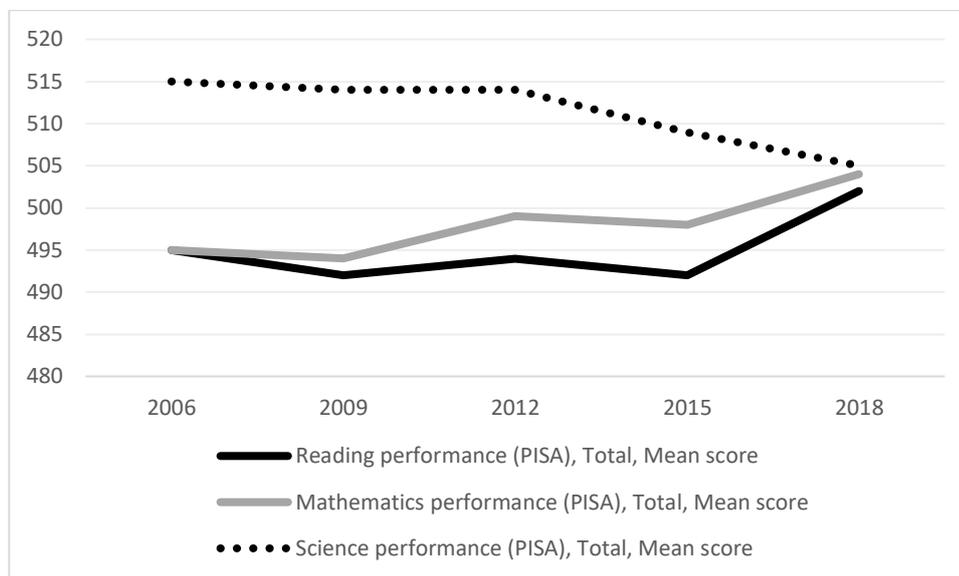
Source: OECD (2023i)

Private - Non-Market

One positive private – non-market externality is directly linked with literacy. The Programme for International Student Assessment (PISA) is the largest international school performance study. PISA does not ask for factual knowledge, but tests whether participants can apply their knowledge and link information in a meaningful way - key competencies for being successful in the information society of the 21st century. The PISA study takes place every three years and covers reading literacy, mathematics, and science (OECD, n.d.).

Figure 12 shows that since 2006, the students of the United Kingdom could improve in their reading performance and their mathematics performance.

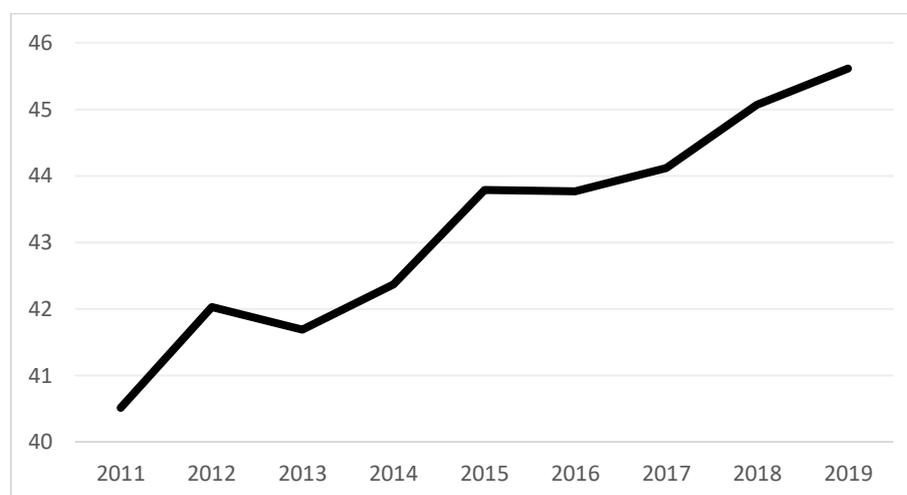
Figure 12: PISA performance: United Kingdom



Source: OECD (2023o); OECD (2023m); OECD (2023l)

Tertiary educational attainment is another private - non-market externality which was analyzed. The indicator is defined as the percentage of people aged 25 to 34 who have completed postsecondary degrees (e.g., university, higher technical institution, etc.) (eurostat, 2023b). Figure 13 shows that the tertiary educational attainment increased by 5% between 2011 and 2019.

Figure 13: Tertiary educational attainment, age group 25-34: United Kingdom



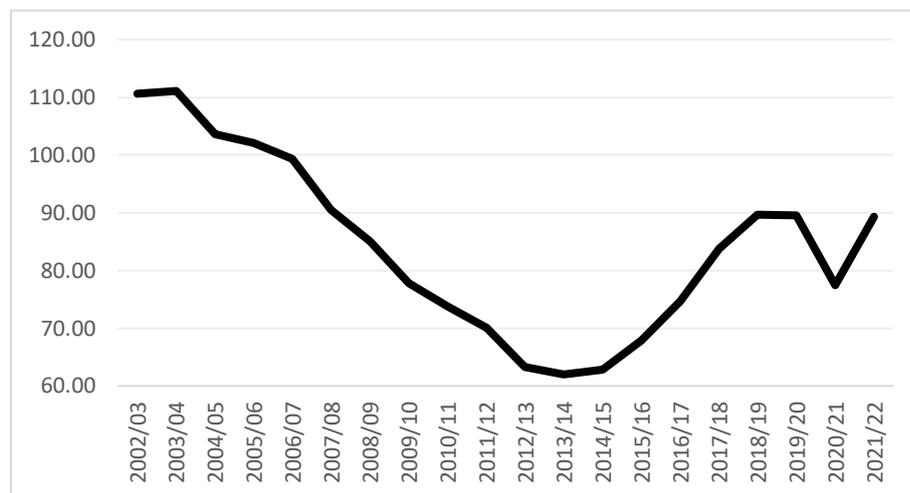
Source: Eurostat (2023b)

Additionally, the scientific journals and articles published rose from around 75'000 in 2001 to almost 100'000 in 2017.

Social – Non-Market

Crime Rates were a social – non-market externality analyzed. Figure 14 shows that in 2019/20, police in the United Kingdom registered over 6.43 million offences, the highest level since 2006/07, when there were approximately 5.97 million. In reality, there have been year-on-year rises since 2013/14, when there were only 4.4 million offences, following an essentially consistent pattern of reducing crime between the early 2000s and the mid-2010s.

Figure 14: Crime rate per 1,000 population in the United Kingdom from 2002/03 to 2021/22, by jurisdiction



Source: Statista (2023)

The social cohesion was again analyzed with the gender wage gap, the proportion of seats held by women in national parliaments, and the female share of employment in senior and middle management. The gender wage gap could be lowered by 55% between 1997 and 2020. While the proportion of seats held by women in national parliaments increased from 18% in 1998 to 34% in 2022, the female share of employment in senior and middle management stayed the same.

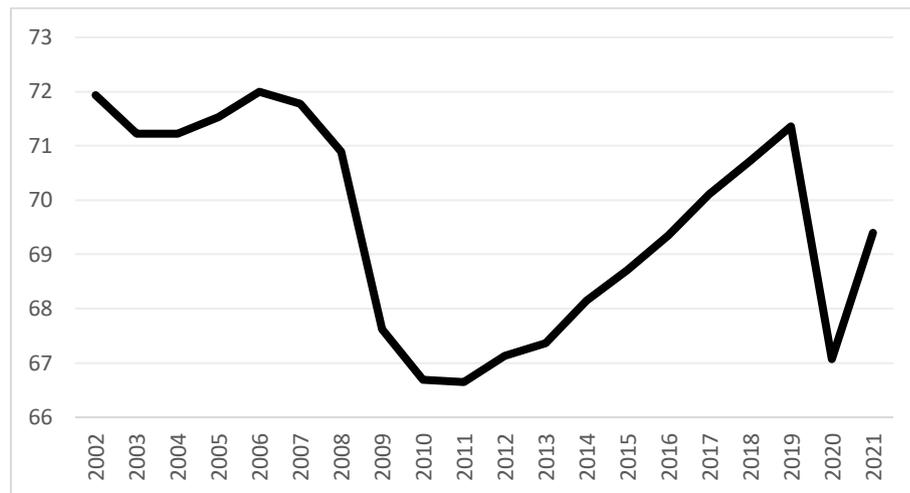
Americas

United States of America

Private – Market

Figure 15 shows that the employment rate of the United States were slightly rising between 2003 and 2006 but drastically decreased due to the financial crisis. The rate could the recover and in 2019 almost reached the 72% it had in 2006. Due to the Covid-19 crisis it fell is now on the rise again. Employed individuals are those aged 15 and up who report working in gainful employment for at least one hour in the previous week or who had a job but were absent during the reference week. People between the ages of 15 and 64 are considered to be of working age (OECD, 2023c).

Figure 15: Employment ratel of working age population, 2002 – 2021: United States



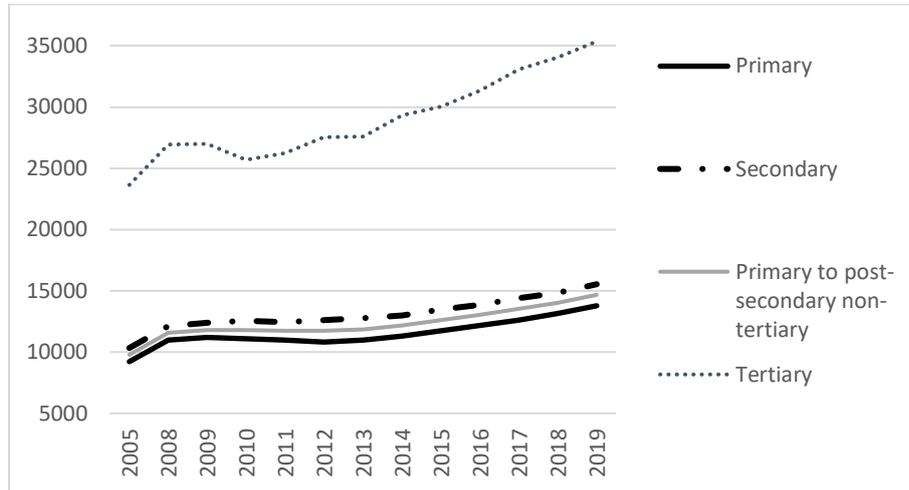
Source: OECD (2023c)

Social – Market

The economy of the United States measured in GDP per Capita rose 77% since 2003 (World Bank, 2023b) and the productivity measured in GDP per hour worked increased by almost 30%. (OECD, 2023i). Figure 16 shows that the United States increased their educational spending. Education spending includes money spent on public and private schools, universities, and other educational institutions.

Spending covers instruction and associated services offered by educational institutions to students and families (OECD, 2023b). The United States spends more than double the amount for tertiary education than for the other three individually.

Figure 16: Education spending in US\$: United States

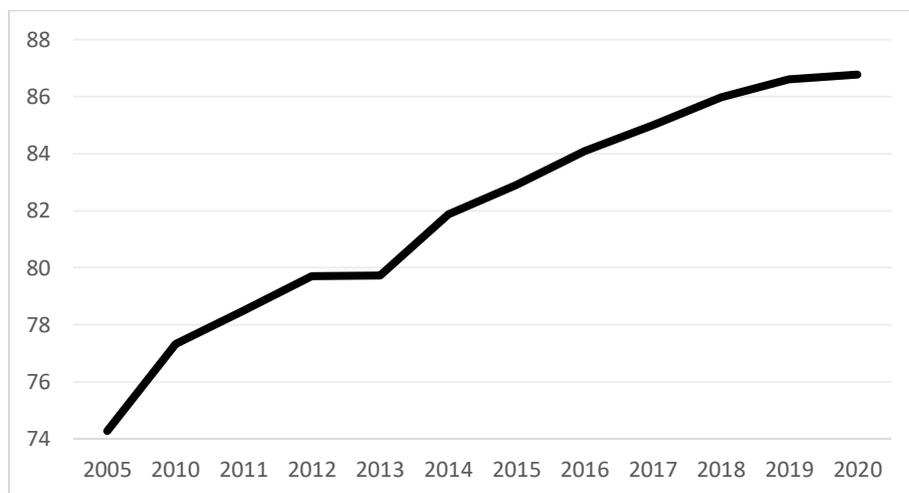


Source: OECD (2023b)

Private - Non-Market

A private – non-market externality analyzed was the secondary graduation rate. Secondary graduation rate represents the estimated percentage of people who will graduate from secondary education over their lifetime. (OECD, 2023p). Figure 17 shows that since 2005, the graduation rate increased by approximately 12%.

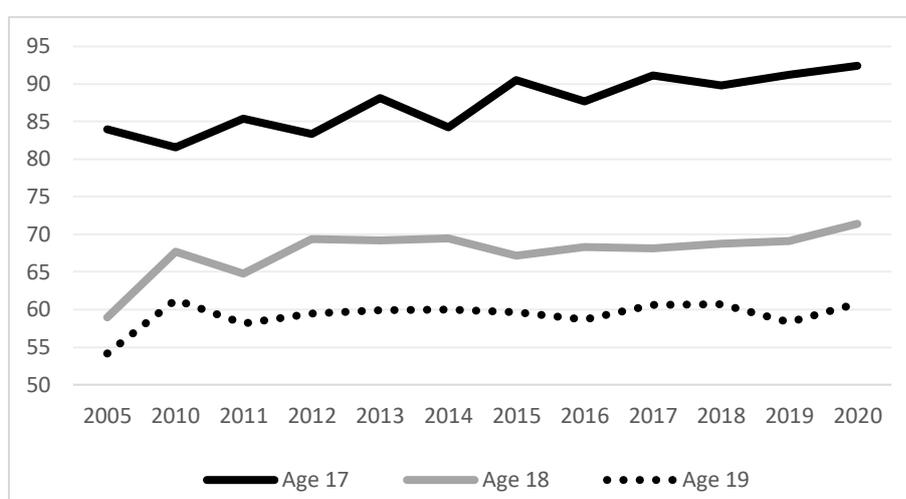
Figure 17: Secondary graduation rate: United States



Source: OECD (2023p)

Figure 18 shows the enrollment rates in secondary and tertiary education of 17- to 19-year-old. Enrolment rates in secondary and tertiary education are expressed as net enrolment rates. These rates are calculated by dividing the number of students of a certain age enrolled in these levels of education by the population of that age. Figures are often based on head counts and do not differentiate between full-time and part-time studies (OECD, 2023h). In every age-group there was an increase whereas the 18-year-old show the biggest improvement.

Figure 18: Enrolment rate in secondary and tertiary education 17-year-old / 18 year-old / 19 year-old, % in same age group: United States



Source: OECD (2023h)

Additionally, Figure 53 shows that scientific journals and articles published increased by 38% and trademark applications of American residents by 119%.

Social – Non-Market

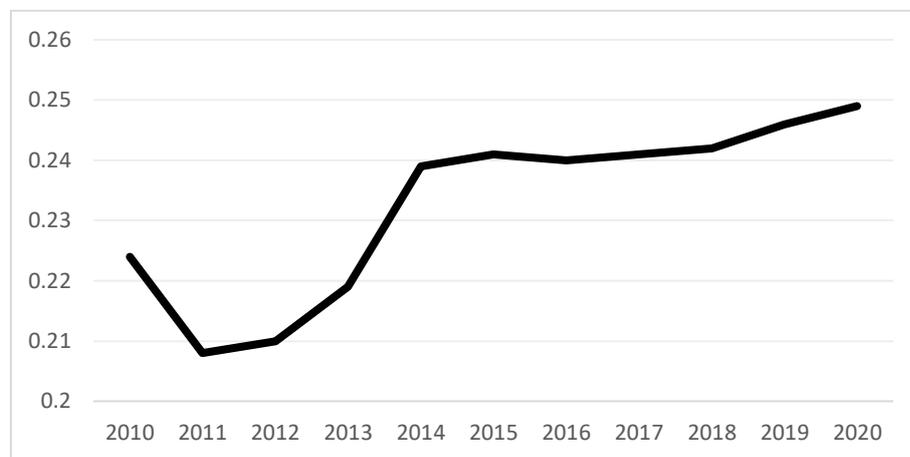
The social cohesion (see Appendix 8) was again analyzed with the gender wage gap, the proportion of seats held by women in national parliaments, and the female share of employment in senior and middle management. Figure 54 shows that since 2003, the gender wage gap could be lowered by 18%. Figure 55 displays that both, the proportion of seats held by women in national parliaments, and the female share of employment in senior and middle management increased. The former from 13% to 28% and the latter from 37% to 42%.

Brazil

Private - Market

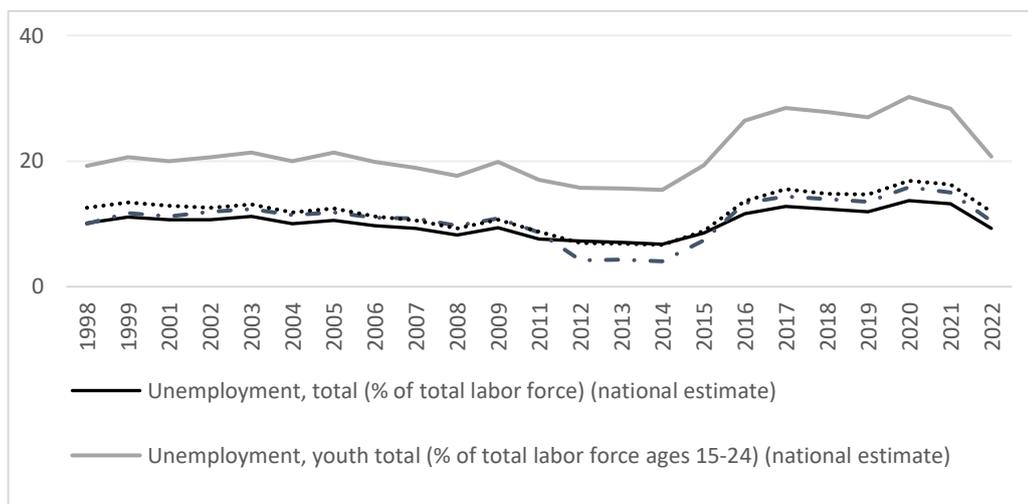
The private – market externalities analyzed were student mobility measured by tertiary student inflow, % of students enrolled and unemployment. Figure 19 shows that in 2010 there was decrease but in 2012 there is a steep curve upwards until 2015 and a steady rise until 2020 which shows that Brazil is becoming more attractive to international students. Figure 20 displays different unemployment rates. Since the implementation of FUNDEF, all four unemployment rates decreased until 2014 where they rose again.

Figure 19: Student Mobility (Tertiary student inflow, % of students enrolled): Brazil



Source: OECD (2023k)

Figure 20: Unemployment rates: Brazil

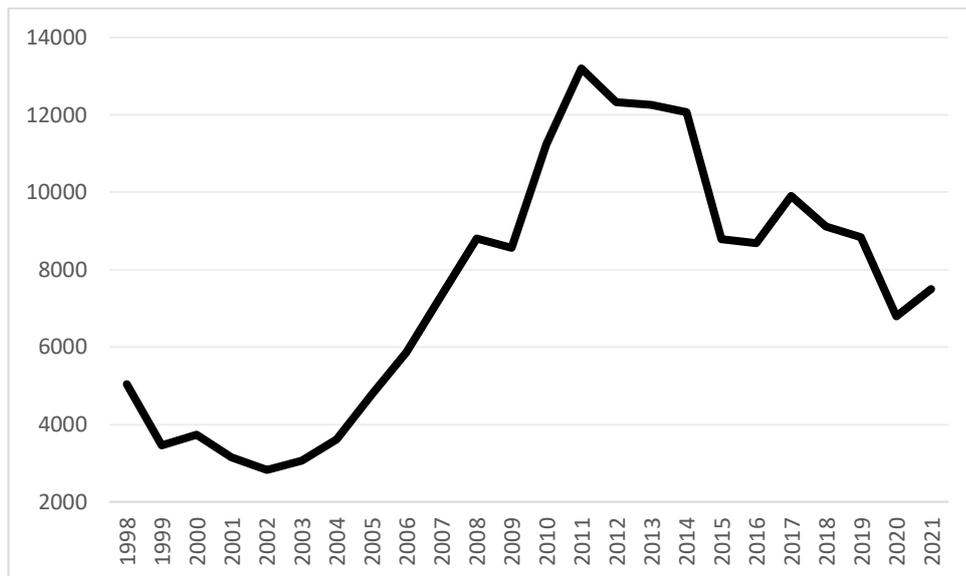


Source: World Bank (2023b)

Social - Market

Figure 21 shows that Brazil's economy measured by GDP per Capita slightly decreased from 1998 until 2002 and then more than tripled until 2011. It could not hold the positive growth and decreased again from 2011 on.

Figure 21: GDP per Capita US\$: Brazil

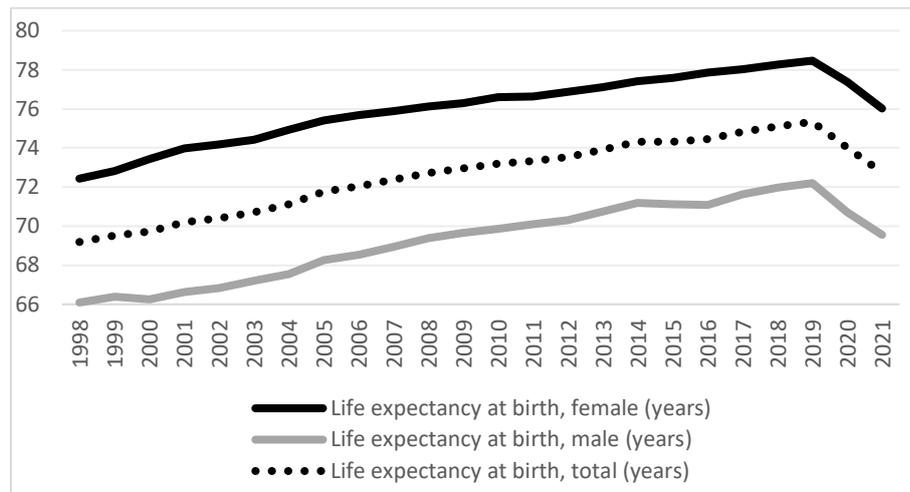


Source: World Bank (2023b)

Private - Non-Market

Private – Non-Market externalities analyzed were educational attainment, PISA performance, and life expectancy. Figures of the former two are displayed in Appendix 9. Figure 56 shows educational attainment. It is the percentage of population ages 25 and over that attained or completed primary, lower secondary and upper secondary education. In 2018, 80% completed at least primary education which is an increase of 12% to 2004. The biggest increase shows the people who completed at least upper secondary education with 18%. Additionally, Figure 57 shows that Brazilian pupils could improve in all fields of the PISA assessment test. The life expectancy at birth of males and females both improved since 1998 as displayed in Figure 22. Combined improved the life expectancy at birth by 5% or 3.5 years.

Figure 22: Life Expectancy at birth: Brazil

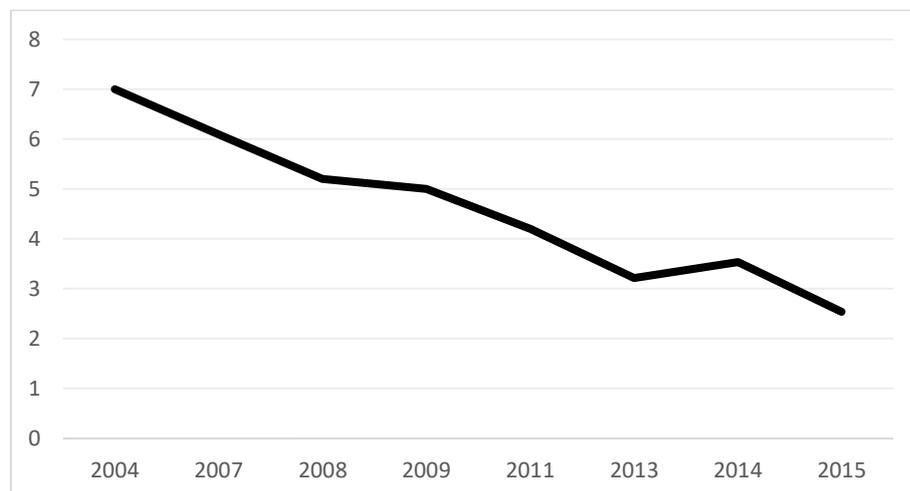


Source: World Bank (2023b)

Social – Non-Market

Children employment and social cohesion were social- non-market externalities analyzed. Children in employment refer to children involved in economic activity for at least one hour in the reference week of the survey (World Bank, 2023b). Figure 23 shows that the children in employment could be lowered by 63%.

Figure 23: Children in employment, total (% of children ages 7-14): Brazil

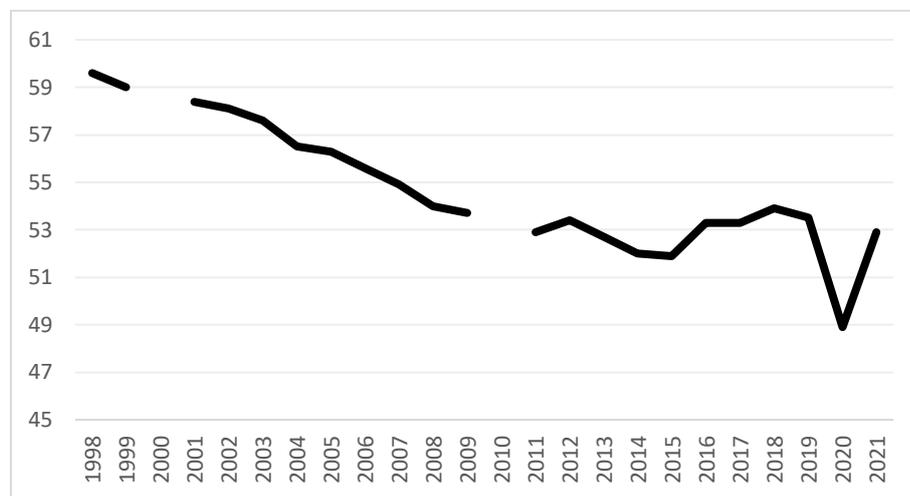


Source: World Bank (2023b)

For the social cohesion, again the gender wage gap, the proportion of seats held by women in national parliaments, and the female share of employment in senior and middle management were analyzed.

The gender wage gap could be reduced by 39%, the proportion of seats held by women in national parliaments increased from 6.6% in 1998 to 17.7% in 2022, and the female share of employment in senior and middle management increased by 9% (World Bank, 2023b). Additionally, Figure 24 shows the GINI Index. The Gini index evaluates how far an economy's distribution of income among individuals or households deviates from a perfectly equal distribution. A Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality (World Bank, 2023b). The Gini index could be lowered from 59 to 51.9 from 1998 to 2015. Switzerland which is seen as a country with relatively equal distribution has a Gini index of 33.1 (2018) (World Bank, 2023b)

Figure 24: Gini Index: Brazil



Source: World Bank (2023b)

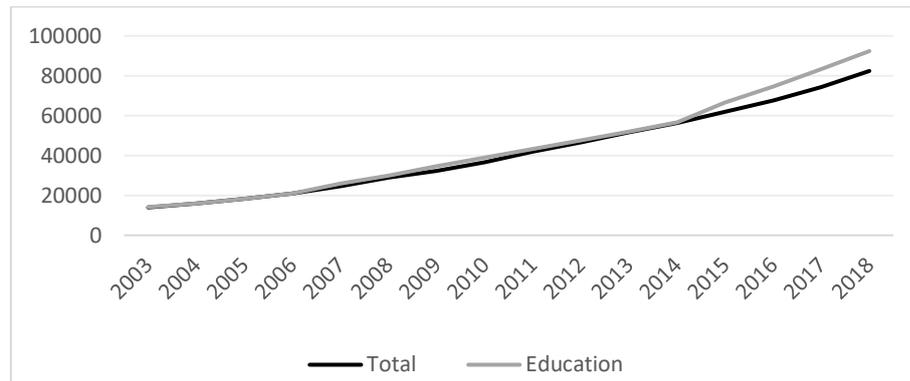
Asia

China

Private - Market

Private-market externalities looked into were average wages, per capita annual income and expenditure of urban households, student mobility. The average wages were distinguished between total and education sector. Figure 25 shows that the average wages both increased simultaneously until 2014 and then the education sector started to earn more in average.

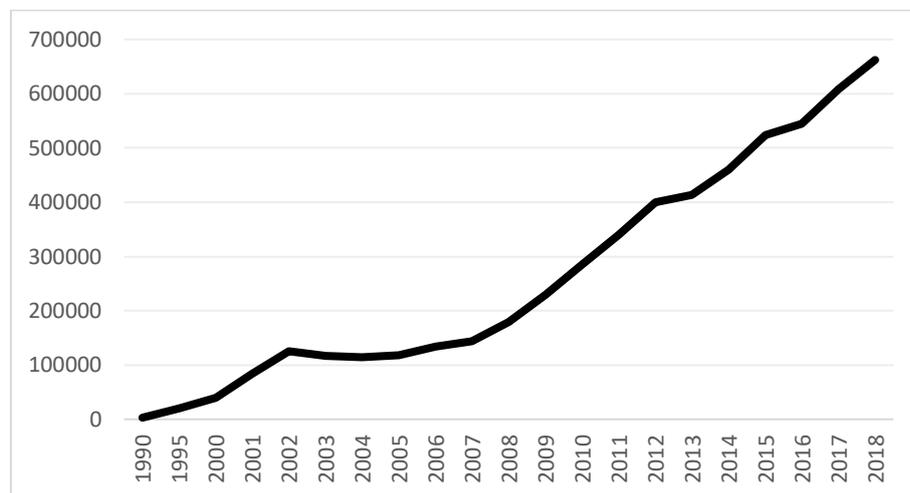
Figure 25: Average wage of employed Persons in urban non-private units by sector (yuan): China



Source: National Bureau of Statistics (n.d.)

The per capita annual disposable income of Chinese residents of urban households increased by more than 500% between 1995 and 2013 and their expenditure on education, culture and recreation increased even more with almost 600%. Student mobility was measured with the number of students studying abroad. Figure 26 shows that while in 1990 2’950 students were studying abroad, the number increased significantly to 662’100 in 2018.

Figure 26: Number of students studying abroad: China



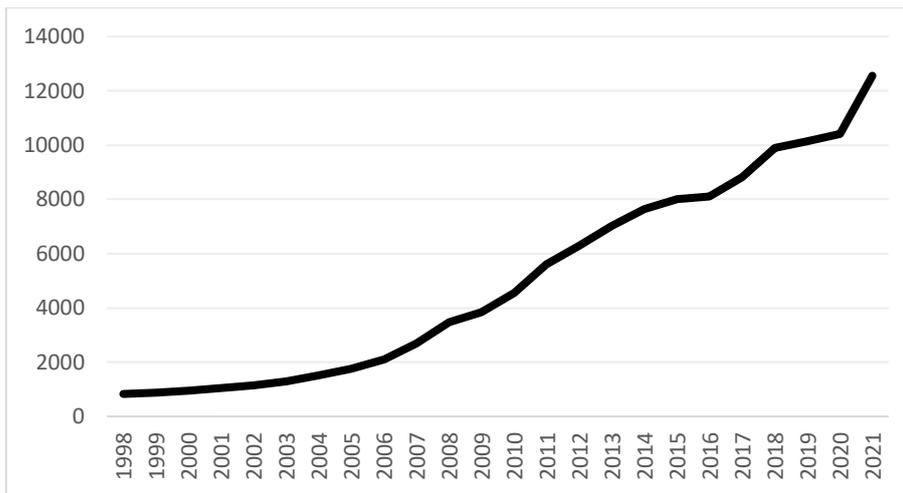
Source: National Bureau of Statistics (n.d.)

Social – Market

With their Higher Education Reforms, China changed their educational landscape with different social – market externalities. The number of research and development (R&D) institutions increased from 6’082 in 2009 to 16’380 in 2018.

Their expenditure on R&D more than doubled and so did R&D Projects. They almost doubled their number of people working in R&D from around 500'000 to almost a million (National Bureau of Statistics, n.d.). China could also record an increase in economic growth measured in GDP per Capita in US\$. Figure 27 shows that the GDP had an increase of more than 1400% since 1998.

Figure 27: GDP per Capita in US\$: China

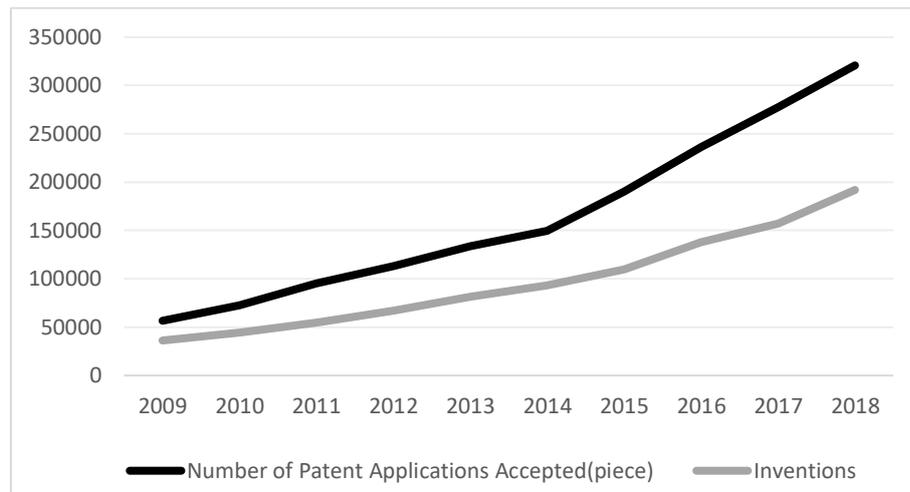


Source: World Bank (2023b)

Private - Non-Market

Trademark applications of Chinas residents increased by 1600% and the total count in 2020 is around 9 million. Scientific journal and articles published in the fields of physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering and technology, and earth and space sciences increase by 1400% between 2004 and 2020 (World Bank, 2023b). Another externality which could also be seen as a social-market and social non-market externality are inventions. Figure 28 shows the number of inventions and the number of accepted patent applications. Both increased significantly since 2009.

Figure 28: Number of Patent Applications Accepted (piece) and inventions: China



Source: National Bureau of Statistics (n.d.)

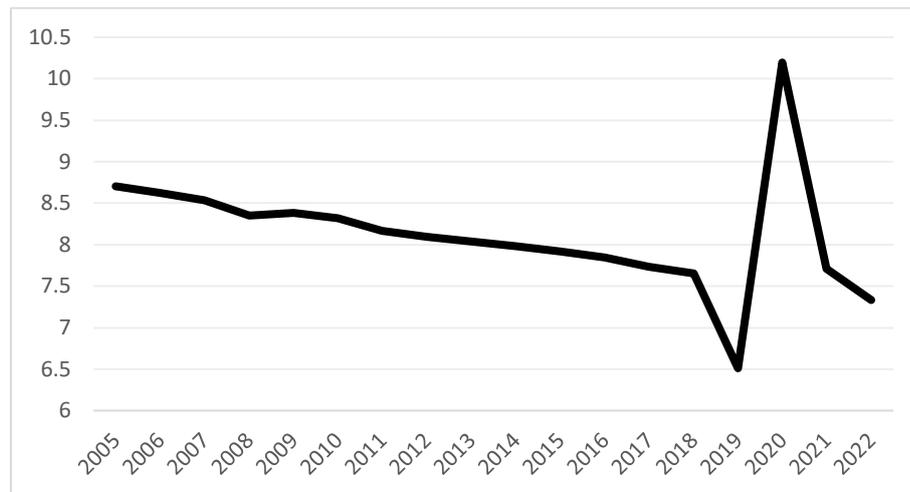
Additionally, the gross school enrollment ratio of tertiary education showed an increase from 5.8% in 1998 to 63.6% in 2021. The gross enrolment ratio is the ratio of total enrollment, independent of age, to the population of the age group that corresponds officially to the degree of education represented (World Bank, 2023b).

India

Private - Market

A private – market externality looked into was unemployment. Figure 29 shows that India’s unemployment rate constantly decreased until 2018 where it fell more than one percent to 6.51% and then drastically rose again in the beginning of the Covid-19 crisis.

Figure 29: Unemployment rate: India

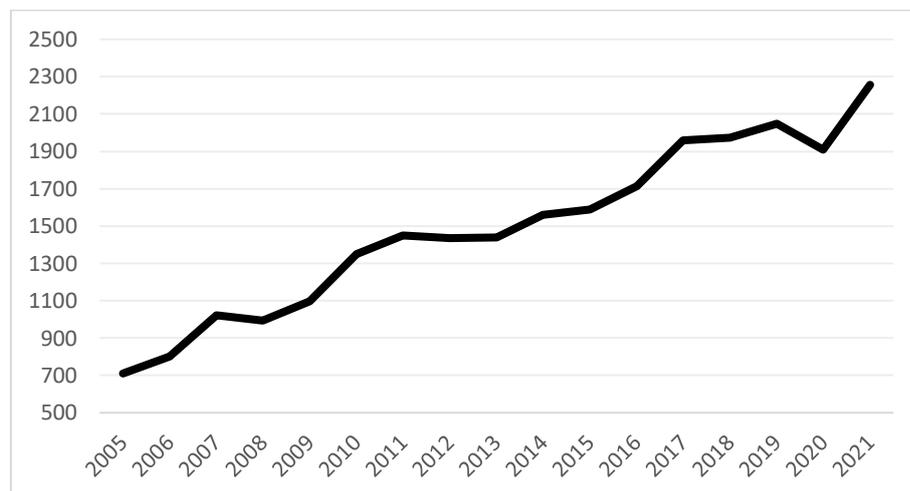


Source: World Bank (2023b)

Social - Market

India's economic growth measured again in GDP per Capita in US\$ constantly increased from around 700 US\$ in 2005 to 2250 US\$ in 2021 which is an increase of 217%. The Covid-19 pandemic shortly interrupted the uphill trend, but India could recover instantly as displayed in Figure 30.

Figure 30: GDP per capita in current US\$: India



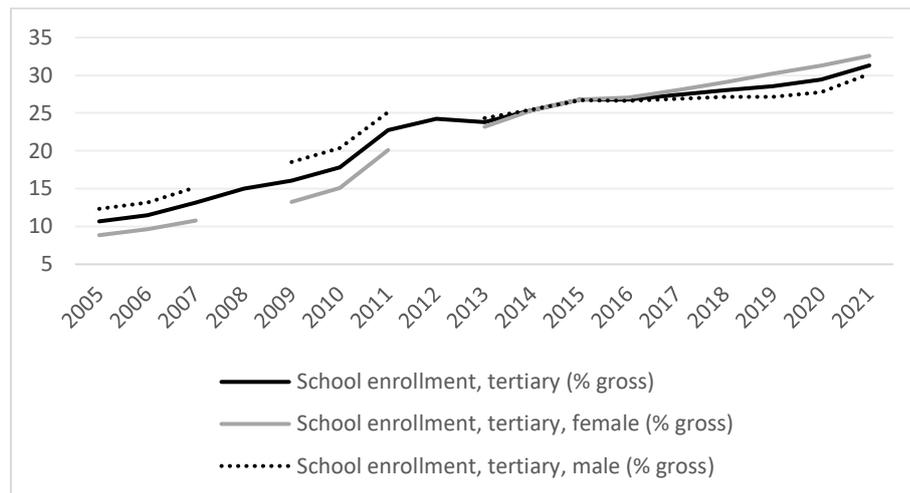
Source: World Bank (2023b)

Private - Non-Market

Private – Non-Market externalities analyzed were school enrollment and personal health.

A positive externality of a curriculum which mainly focuses on primary education is a increasing enrollment in tertiary education. Figure 31 displays three ratios: total, female, and male. All of them increased simultaneously from around 10% in 2005 to 30% in 2021.

Figure 31: School enrollment, tertiary (% gross): India



Source: World Bank (2023b)

To see the effects on personal health, life expectancy at birth and lifetime risk of maternal death were looked at. Life expectancy at birth of males increased by 3.2% or 2 years whereas females increased the expectancy by 3.8% or 2.5 years. The lifetime risk of maternal death dropped from 1% to 0.2% in 15 years. The lifetime risk of maternal death is the likelihood that a 15-year-old female will die from a maternal cause (World Bank, 2023b).

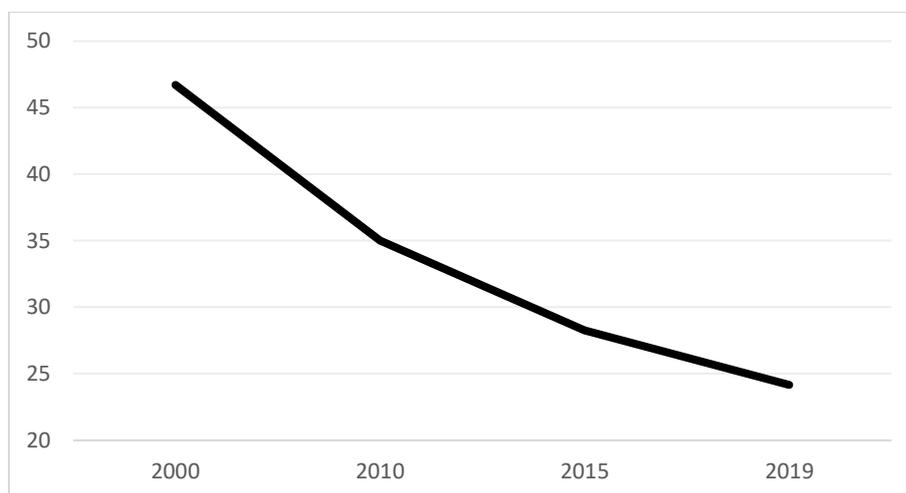
Social – Non-Market

Social – non-market externalities analyzed were crime rates, social cohesion, and the spread of infectious diseases. Crime rates were measured by intentional homicides per 100'000 people. This number decreased by 25% between 2005 (3.9 homicides) and 2021 (2.9 homicides) (World Bank, 2023b). Social cohesion is measured by the proportion of seats held by women in national parliaments which increased 80% since 2005 and is now at an all-time high with 14.9% (World Bank, 2023b).

Figure 32 shows the percentage of all death which are caused by communicable diseases and maternal, prenatal and nutrition condition.

This number decreased by 48% from 2000 to 2019. Incidences of tuberculosis per 100'000 also dropped from 329 in 2005 to 2010 in 2021. The prevalence of HIV could be cut in half in the same time span (World Bank, 2023b)

Figure 32: Cause of death, by communicable diseases and maternal, prenatal and nutrition conditions (% of total): India



Sources: World Bank (2023b)

Africa

Nigeria

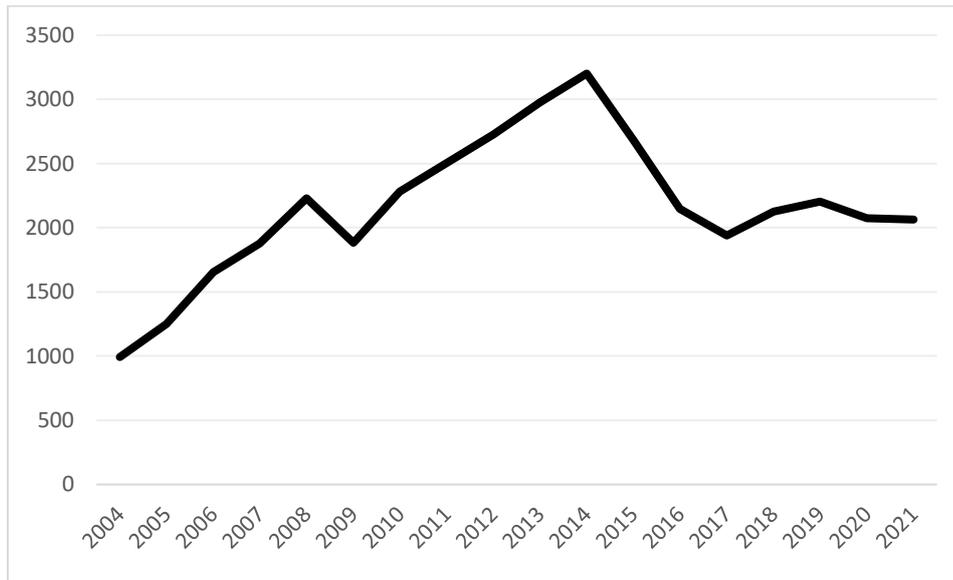
Private - Market

A private – market externality looked at was the number of employed teachers in Nigeria which can be an indicator of employability in the education sector. Between 2004 and 2019, the number of primary education teachers in Nigeria increased by 67%, the number of secondary education teachers by 400%. The number of trained teachers in primary education increased by 26% between 2004 and 2018. Between 2006 and 2018, the number of trained teachers in secondary education decreased by 4% as well as a 16% decrease in upper secondary education (World Bank, 2023b).

Social - Market

Nigeria’s economic growth measured again in GDP per Capita in US\$ almost tripled from 2004 to 2014 and the fell around 30% to around 2’000 US\$ until 2017 which is approximately the GDP per Capita today as displayed in Figure 33.

Figure 33: GDP per Capita in US\$: Nigeria

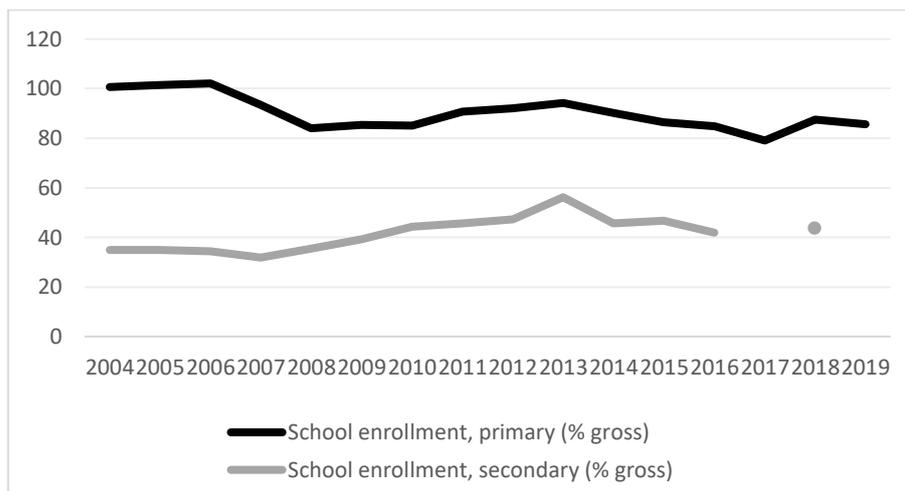


Source: World Bank (2023b)

Private - Non-Market

Private – non-market externalities analyzed were enrollment rates as well as personal health. Figure 34 shows the gross school enrollment of primary and secondary education. Secondary enrollment could improve by 24% whereas the primary enrollment ratio decreased 15%.

Figure 34: Gross school enrollment of primary and secondary education (%): Nigeria

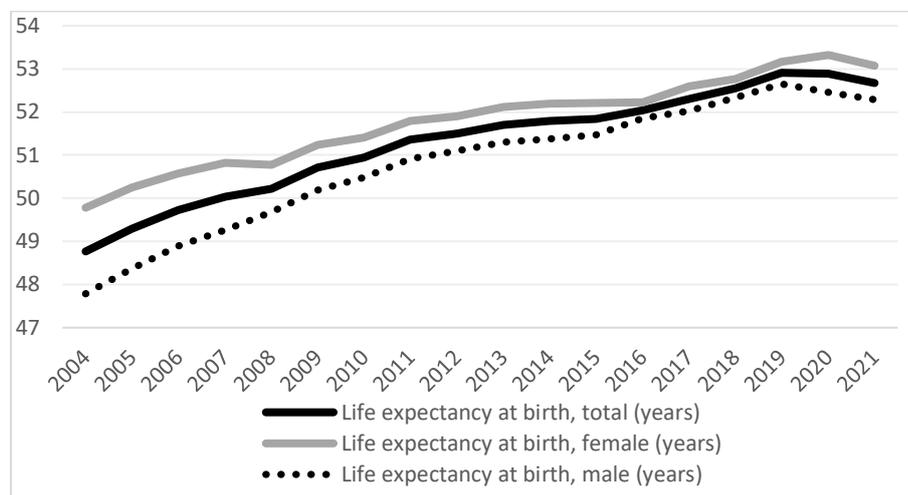


Source: World Bank (2023b)

Personal health was again measured by life expectancy at birth and lifetime risk of maternal death. Figure 35 shows the three different life expectancies at birth.

It shows a simultaneous increase whereas females have a higher life expectancy at birth than males, but the difference could be minimized over the years. The lifetime risk of maternal death dropped from 6.4 in 2004 to 5.25 in 2020 (World Bank, 2023b).

Figure 35: Life expectancy at birth: Nigeria

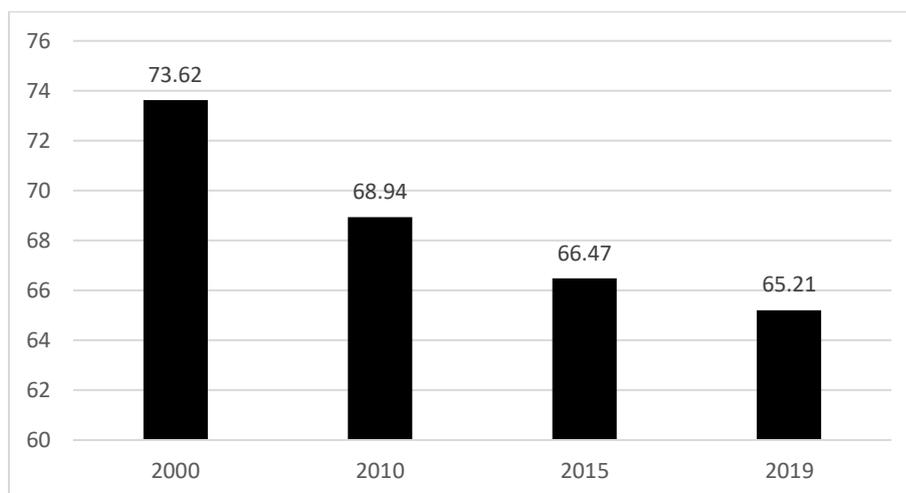


Source: World Bank (2023b)

Social – Non-Market

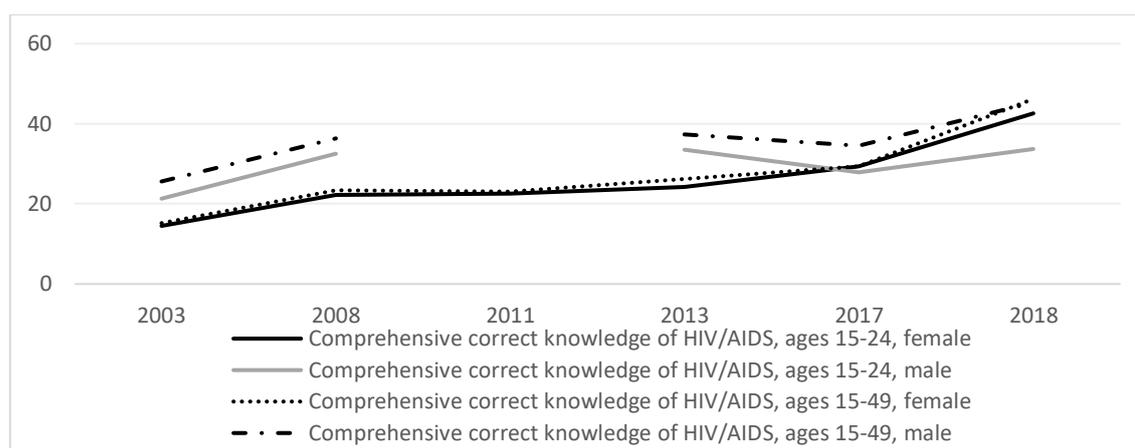
Social – non-market externalities analyzed were the spread of infectious diseases. Figure 36 shows the percentage of deaths caused by communicable diseases and maternal, prenatal and nutrition conditions. During the four data extraction years, the percentage could be lowered by 11.4%. Another indicator analyzed was prevalence of HIV between 2004 and 2021. In Appendix 11, Figure 60 shows that the percentage of females who are infected with HIV dropped from 1.9% to 1.3%. The prevalence of HIV in males stayed the same. Additionally, the incidence of HIV was investigated. The incidence of HIV is the number of new HIV infections among uninfected populations expressed per 1’000 uninfected people in the preceding year. Figure 61 shows a decrease of 69%. This could all relate to increasing comprehensive correct knowledge of HIV/AIDS displayed in Figure 36. Comprehensive correct knowledge of HIV/AIDS is defined by correctly identifying the two key methods of preventing HIV transmission through sexual contact (using condoms and limiting intercourse to one loyal, uninfected partner), rejecting the two most popular local myths regarding HIV transmission, and understand that a healthy-looking individual can have HIV. Additionally, condom use increased in males and females as displayed in Figure 62 (World Bank, 2023a).

Figure 36: Cause of death, by communicable diseases and maternal, prenatal, and nutrition conditions (% of total): Nigeria



Source: World Bank (2023a)

Figure 37: Comprehensive correct knowledge of HIV/AIDS: Nigeria



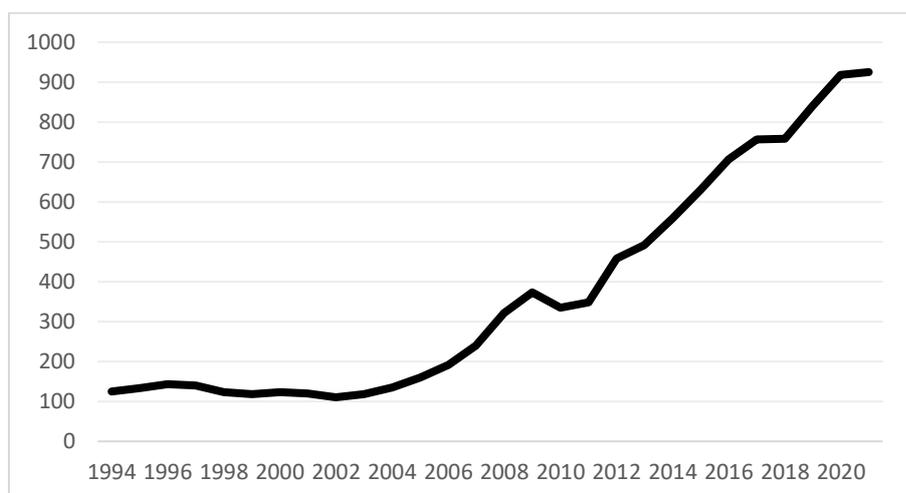
Source: World Bank (2023a)

Ethiopia

Social - Market

Figure 38 shows that Ethiopia's economic growth measured again in GDP per Capita in US\$ increased from 140 US\$ in 1997 to 925 US\$ in 2021 which is an increase of 642%. The GDP per capita curve does not show major drawbacks in 2007 during the financial crisis nor in 2019 where the Covid-19 crisis started.

Figure 38: GDP per Capita in US\$: Ethiopia



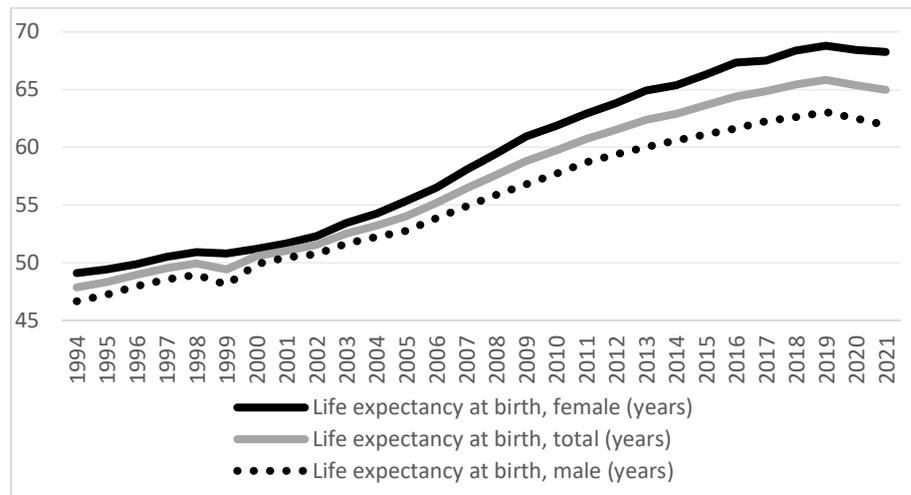
Source: World Bank (2023b)

Private - Non-Market

Private – non-market externalities analyzed were enrollment rates, personal health, and scientific and technical journal articles published. The enrollment rates include the net enrollment rate of primary education and the gross enrollment rate of tertiary education. The net enrolment rate is the proportion of children of official school age who are enrolled in school to the population of the same age. The gross enrolment ratio is the ratio of total enrollment, independent of age, to the population of the age group that corresponds officially to the degree of education represented. School enrolment in primary education increased from 19% in 1994 to 85% in 2015. The gross rate of tertiary school enrolment grew from 0.6% to 10.4% (World Bank, 2023b).

Personal health was again measured by life expectancy at birth and lifetime risk of maternal death. The life expectancy at birth of males increased by 32% or 15 years and the life expectancy at birth of females by 39% or 19 years as displayed in Figure 39. Figure 63 in Appendix 12 shows that the lifetime risk of maternal death decreased by 80%. The number of scientific and technical journal articles published rose from 150 in 1998 to almost 4'000 in 2020 (World Bank, 2023b).

Figure 39: Life expectancy at birth: Ethiopia

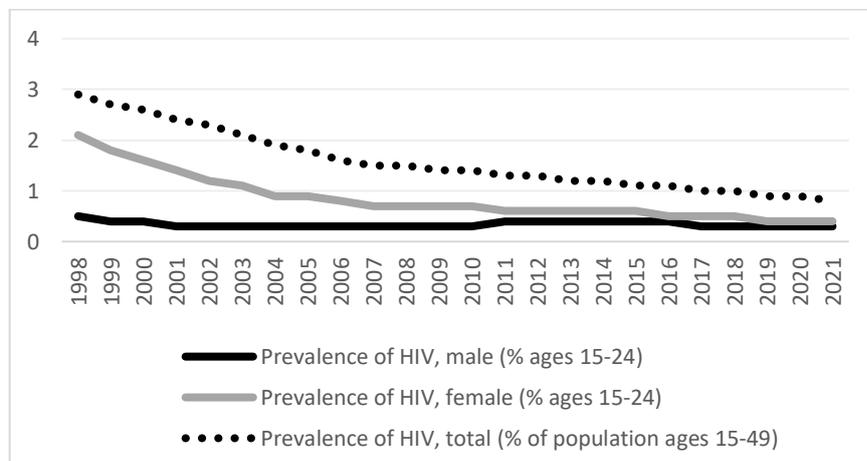


Source: World Bank (2023b)

Social – Non-Market

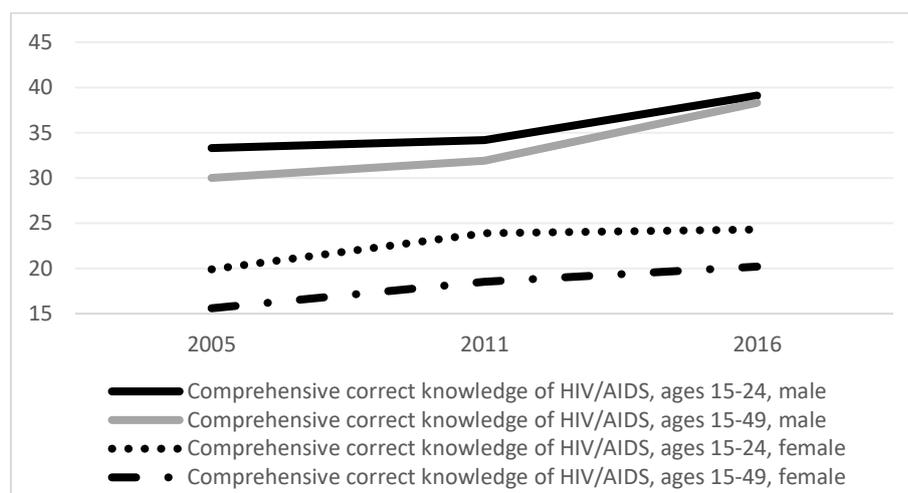
Social – non-market externalities analyzed were the spread of infectious diseases and social cohesion. During the four data extraction years (2000 – 2019), the percentage could be lowered from 66.7% to 44.6%. Another indicator analyzed was the prevalence of HIV between 1998 and 2021 as displayed in Figure 40 which shows that it has been a decline for females between ages 15 and 24 but also for the total population between ages 15 and 49. The incidence of HIV per 1’000 uninfected people could also be minimized by 93% (World Bank, 2023a). This could be related to the increase of comprehensive correct knowledge of HIV/AIDS displayed in Figure 41. The Incidence of tuberculosis per 100’000 people also decreased from 421 in 2000 to 119 in 2021 (World Bank, 2023a).

Figure 40: Prevalence of HIV: Ethiopia



Source: World Bank (2023a)

Figure 41: Comprehensive correct knowledge of HIV/AIDS: Ethiopia



Source: World Bank (2023a)

Social cohesion is measured by the proportion of seats held by women in national parliaments and the female share of employment in senior and middle management. The former increased from 2% in 1998 to 41% in 2022. The latter increased from 14.1% in 1999 to 27% in 2021 (World Bank, 2023b).

Australia

Private - Market

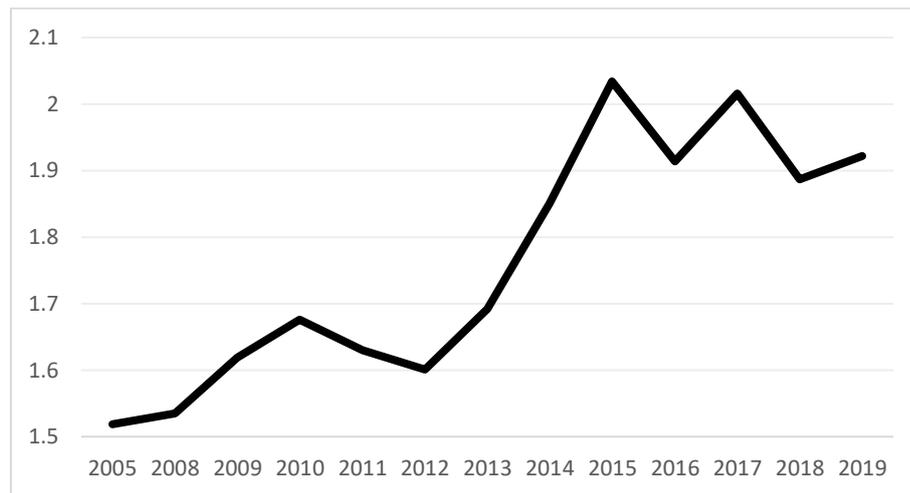
Private – Market externalities analyzed were wages, employment rates, and student mobility. The average wages increased 19% from 2003 to 2021. (OECD, 2023a). Employment rates were distinguished by education level (tertiary), age group (25-54), and the total employment rate between 2003 and 2021. The employment rate of people with completed tertiary education increased by 2.7%, the rate of people between 25 and 54 years old by 5.9%, and the total employment by 10.3% as displayed in Appendix 1. Student mobility was measured with the tertiary student inflow as a percentage of total students enrolled. From 2005 to 2020 there was an increase of 50% (OECD, 2023k).

Social - Market

Social-Market externalities analyzed were economic growth, productivity, and governmental spending on tertiary education.

The GDP per Capita in US\$ rose from 23'700 US\$ in 2003 to 60'400 US\$ in 2021 (World Bank, 2023b) and during the same time the GDP per hour worked increased from 87 US\$ to 105 US\$. (OECD, 2023i). Figure 42 shows that the Australian government increased its spending on tertiary education by 26.5%.

Figure 42: Education spending Tertiary, % of GDP: Australia

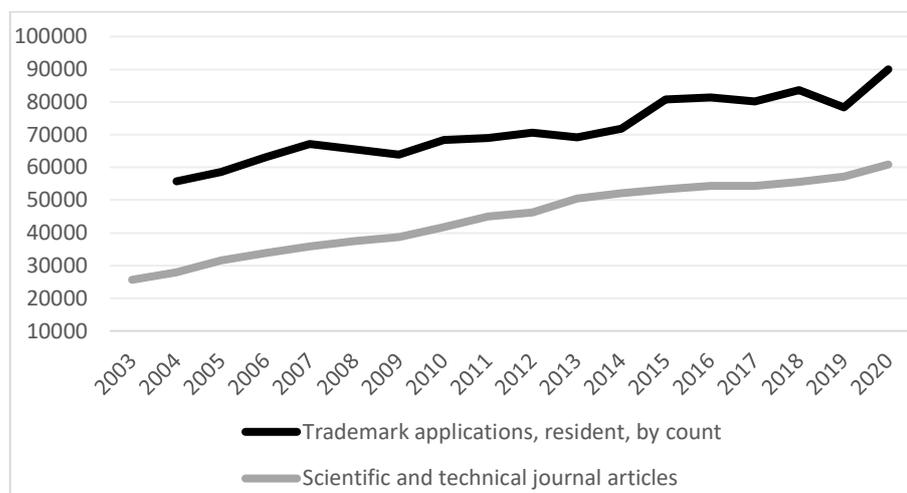


Source: OECD (2023b)

Private - Non-Market

Private – non-market externalities analyzed include trademark applications of Australian residents, scientific and technical journal articles published, and the number of researchers. Figure 43 shows that there has been a constant simultaneous increase of both. The number of researchers per 1'000 employed increased from 7.3 in 2000 to 9.0 in 2010. Researchers are professionals who are involved in the invention or creation of new knowledge, products, processes, methods, and systems, as well as project management (OECD, 2023n).

Figure 43: Trademark applications, resident, by count and published scientific and technical journal articles: Australia



Source: World Bank (2023b)

Social – Non-Market

Social – Non-Market externalities analyzed were social cohesion again measured by the gender wage gap, the proportion of seats held by women in national parliaments, and the female share of employment in senior and middle management. The Gender wage decreased by 25% from 2003 to 2022. Figure 44 shows that from 2003 the proportion of seats held by women in national parliaments rose from around 25.3% in 2003 to 38.4% in 2022. Between 2010 and 2021, the female share of employment in senior and middle management first decreased but later recovered to 38.2%.

Figure 44: Proportion of seats held by women in national parliaments and the female share of employment in senior and middle management: Australia



Source: World Bank (2023b)

5. Discussion

1. What are the main positive externalities of educational reforms and policymaking?

The main positive externalities from which every investigated country benefited were the social – market externalities namely economic growth and productivity. Additionally, social cohesion improved in almost all analyzed countries. Educational reforms and policies in the tertiary sector could improve student mobility and contributed to the development of R&D and its implications. Educational reforms and policies which targeted either primary education or education as a whole increased educational attainment in secondary or tertiary education. They also positively contributed to decision-making skills.

2. What kind of differences regarding the level of development exist?

Positive externalities of educational reforms and policies in developing countries were often located in the two non-market quadrants. Especially personal health and the spread of infectious diseases were present externalities that improved significantly since the educational reforms and policies were implemented. Positive externalities of educational reforms and policies in developed countries could be found in all quadrants. Although developing countries were lower in numbers when it comes to different positive externalities, their growth rate showed often higher levels over the time. Surprisingly, in the two market quadrants, developing countries were less affected by the financial and Covid-19 crises.

3. Do the results allow to share a best practice of educational reforms for policymaking?

No best practice could be identified. The reforms were too different from each other in terms of the target group, key objectives, and governmental recourses. While most externalities improved positively after the implementation of educational reforms and policies, the causal relationship between them is not always given. Although research shows that there is a correlation between education and all externalities analyzed, the question is how much of a contribution this reform or policy was to the externality.

For example, for the prevalence of HIV in developing countries, education is essential to minimize infections, so the educational reform surely has a positive impact. Foreign and local NGOs, governmental actions campaigns, and enlightenment via the Internet are all factors contributing too. The same occurs for example at the externality of economic growth. Hundreds of other factors are contributing to economic growth, and it is almost impossible or associated with a great deal of effort to estimate how much an educational reform or policy actually positively contributed to an externality.

The Four-Cell Matrix

Daniel Münich's and George Psacharopoulos' four-cell matrix provided a useful framework for this investigation. It provides broad concepts of various externalities, which may then be retrieved from a variety of data sources. It was occasionally difficult to determine which externality belonged to which quadrant. Furthermore, most non-market quadrants are difficult, if not impossible, to quantify with the data provided.

6. Conclusion

The purpose of this investigation was to look into how various educational reform strategies and policies contribute to positive externalities worldwide. Throughout this investigation, it has been clear that educational changes can have a substantial impact on numerous aspects of society's development and progress. It was discovered that measures aimed at enhancing educational quality and access resulted in significant improvements in economic development, social mobility, and health outcomes. Reforms and policies varied greatly from country to country. Some focused on primary education and general access to education whereas others targeted tertiary education and wanted to improve their educational competitiveness on a global scale.

The positive externalities of educational reforms and policies in developing nations predominantly fell within the two non-market quadrants. Notably, personal health improvements and a significant reduction in the spread of infectious diseases were common positive outcomes realized since the inception of these reforms.

In contrast, developed countries demonstrated the presence of positive externalities across all quadrants as a result of educational reforms and policies.

While the range of positive externalities observed in developing nations was narrower in comparison, it's important to note that these countries often exhibited a higher growth rate over the period analyzed.

Externalities not only varied between countries regarding their development stage but also between reforms and policies that targeted different educational levels.

While most externalities improved after educational reforms and policies were implemented, the causal relationship between them is not always established. Although research indicates a link between education and all of the externalities studied, the question is how big of a contribution this reform or policy made to the externality.

More studies might be conducted to investigate the impact of educational changes in under-researched or unique situations, such as rural vs. urban areas, low-income countries, or certain demographic groupings. Alongside the positive externalities, educational reforms can also lead to negative externalities. Further research could provide a more balanced view by also exploring these potential drawbacks and how they can be mitigated.

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