

# Public Education Expenditure and Economic Growth: A Critical Theoretical Reassessment

## Dépenses publiques d'éducation et croissance économique : une relecture théorique critique

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# Public Education Expenditure and Economic Growth: A Critical Theoretical Reassessment

## **Abstract**

This article offers a critical theoretical reassessment of the role of public education expenditure in the process of economic growth. Drawing on a structured analysis of the main schools of economic thought, ranging from classical and neoclassical theories to human capital theory, endogenous growth models, and contemporary institutional approaches, it highlights the gradual evolution of the place attributed to education in growth analysis, without leading to a unified theoretical consensus.

While classical and neoclassical approaches assign education an indirect or residual role, human capital theory conceptualizes it as a productive investment capable of generating economic returns. Endogenous growth models extend this perspective by incorporating education as an internal engine of growth through human capital externalities and innovation. However, these theoretical frameworks rely on strong assumptions regarding education system quality, institutional effectiveness, and the ability of economies to absorb the human capital produced.

The article argues that the impact of public education expenditure on economic growth is fundamentally conditional. It depends in particular on learning quality, education system governance, the alignment between education and labor market needs, and the structure of the productive sector. By moving beyond a purely quantitative interpretation of educational investment, this critical theoretical reassessment provides a clearer understanding of the heterogeneity of empirical findings in the literature and lays the groundwork for future empirical analyses that incorporate institutional and structural dimensions, especially in developing economies.

**Keywords:** Public education expenditure; Human capital; Learning outcomes; Quality of education; Absorption capacity; Developing economies.

**Classification JEL:** I20; O40; O43

**Paper type:** Theoretical Research

## **Résumé**

Cet article propose une relecture théorique critique du rôle des dépenses publiques d'éducation dans le processus de croissance économique. S'appuyant sur une analyse structurée des principaux courants de la pensée économique, des théories classiques et néoclassiques à la théorie du capital humain, aux modèles de croissance endogène et aux approches institutionnelles contemporaines, il met en évidence l'évolution progressive de la place accordée à l'éducation dans l'analyse de la croissance, sans pour autant dégager un consensus théorique univoque. Alors que les approches classiques et néoclassiques relèguent l'éducation à un rôle indirect ou résiduel, la théorie du capital humain la conceptualise comme un investissement productif générateur de rendements économiques. Les modèles de croissance endogène approfondissent cette lecture en intégrant l'éducation comme moteur interne de la croissance à travers les externalités du capital humain et l'innovation. Toutefois, ces cadres théoriques reposent sur des hypothèses fortes relatives à la qualité des systèmes éducatifs, à l'efficacité des institutions et à la capacité des économies à absorber le capital humain produit.

L'article soutient que l'impact des dépenses publiques d'éducation sur la croissance économique est fondamentalement conditionnel. Il dépend notamment de la qualité des apprentissages, de la gouvernance des systèmes éducatifs, de l'adéquation entre formation et marché du travail, ainsi que de la structure du tissu productif. En dépassant une lecture strictement quantitative de l'investissement éducatif, cette relecture théorique permet de mieux comprendre l'hétérogénéité des résultats empiriques observés dans la littérature et pose les bases d'analyses empiriques intégrant les dimensions institutionnelles et structurelles, en particulier dans les économies en développement.

**Mots-clés :** Dépenses publiques d'éducation ; Capital humain ; Acquis d'apprentissage ; Qualité de l'éducation ; Capacité d'absorption ; Economies en développement.

**JEL Classification :** I20; O40; O43

**Type du papier :** Recherche Théorique

## **1. Introduction**

Education is central to economic development strategies, particularly in countries pursuing sustainable and inclusive growth. Beyond its social dimension, education has long been regarded as a key lever for strengthening human capital, improving labor productivity, and fostering social cohesion, thereby mobilizing a substantial share of public resources (Schultz, 1961; Becker, 1964; Sen, 1999). Yet, despite the steady increase in public education expenditure observed in many countries over recent decades, the economic returns of such spending remain widely debated, especially in contexts where improvements in schooling quantity have not necessarily been matched by equivalent gains in learning outcomes (Hanushek & Woessmann, 2008; World Bank, 2018).

The relationship between education and economic growth has produced mixed and sometimes contradictory evidence in the literature. While many studies emphasize education as a decisive driver of productivity enhancement and innovation, others report weak, insignificant, or even negative short-term effects of education spending on growth (Barro, 1991; Barro, 2001; Pritchett, 2001). These divergent findings suggest that educational investment does not operate as an automatic engine of growth. Instead, its impact may vary according to the structural characteristics of economies, the quality of educational systems, and the capacity of labor markets and productive sectors to absorb and valorize acquired skills (Pritchett, 2001; OECD, 2010). This debate raises a fundamental question: to what extent can public education expenditure drive economic growth, and under which conditions can it generate sustained macroeconomic effects?

From a theoretical perspective, the role attributed to education in growth analysis has progressively expanded. Classical economists primarily explained economic progress through capital accumulation, demographic dynamics, and the division of labor, generally assigning education an indirect social and institutional function rather than a productive role (Smith, 1776/1843; Mill, 1848). Neoclassical models later introduced formal growth frameworks based on aggregate production functions, yet education remained outside the explicit set of productive inputs, being implicitly captured within exogenous technological progress (Solow, 1956, 1957). A major turning point emerged with human capital theory, which conceptualized education as a productive investment generating measurable private and social returns through higher skills and productivity (Schultz, 1961; Becker, 1964; Mincer, 1974). Endogenous growth models further advanced this reasoning by incorporating human capital accumulation and knowledge spillovers as internal mechanisms sustaining long-term growth through innovation and increasing returns (Lucas, 1988; Romer, 1990; Aghion & Howitt, 1998).

However, these theoretical contributions also rely on strong assumptions that may not hold in many developing economies. Specifically, the transformation of education spending into effective human capital depends on learning quality, institutional arrangements, and incentives shaping the performance of public systems (North, 1990; Sen, 1999). Moreover, even when educational attainment increases, macroeconomic gains may remain limited if labor markets are segmented, graduate unemployment is persistent, or productive structures do not generate sufficient demand for skilled labor (Pritchett, 2001). Contemporary institutional approaches and critical analyses therefore emphasize that the impact of public education expenditure depends less on spending volume alone than on its allocation, governance, and coherence with broader structural and economic conditions (OECD, 2010; World Bank, 2018).

In francophone and African contexts, these challenges are often intensified by constraints related to policy implementation, institutional coordination, and structural transformation, which may limit the economic returns to educational investment despite sustained public effort (Al-Jabri, 1972; Aghion, Cohen, & Cetto, 2014).

Although several influential contributions have highlighted specific channels—such as learning quality (Hanushek & Woessmann, 2008), absorption constraints (Pritchett, 2001), or institutional efficacy (World Bank, 2018)—the existing literature remains fragmented across

theoretical traditions. This article contributes by providing a critical and integrated theoretical reassessment that brings these perspectives together within a single coherent analytical framework. Rather than assuming a systematic relationship between education spending and growth, it explains why effects vary across contexts and identifies the main conditions under which public education expenditure can translate into sustainable growth. The article emphasizes the role of learning outcomes, governance mechanisms, education–employment alignment, and the productive sector’s absorption capacity as key determinants of how education spending influences growth trajectories in developing economies.

The remainder of the article is structured as follows. The first section reviews the theoretical literature on the role of education in growth theories. The second section presents the research methodology adopted. The third section develops an analytical framework for discussing the mechanisms and conditions underpinning the efficacy of public education expenditure. Finally, the conclusion synthesizes the main findings and outlines directions for future research.

## **2. Research Methodology**

This article adopts a theoretical and conceptual research approach that analyzes the role of public education expenditure in the process of economic growth. It draws on an analytical and critical review of the economic literature, examining the main theoretical frameworks that have addressed, either explicitly or implicitly, the relationship between education and growth. The objective is not to conduct an exhaustive systematic review, but rather to provide a structured and coherent reading of major theoretical contributions in order to identify the underlying economic mechanisms and the conditions under which educational investment is effective. The literature retained in this article was selected according to minimal relevance criteria aimed at ensuring theoretical consistency and analytical rigor. Priority was given to (i) foundational contributions that formally shaped growth theory and clarified the role of education through production, productivity, or innovation mechanisms; and (ii) influential institutional and policy-oriented works that explicitly address learning outcomes, governance quality, and the economy’s absorption capacity as key conditions affecting the efficacy of education expenditure.

The selection of studies relies on a twofold criterion. First, foundational contributions from classical, neoclassical, human capital, and endogenous growth theories are included due to their structuring role in the analysis of economic growth. Second, more recent contributions from institutional and critical approaches are mobilized to enrich the analysis and to account for the limitations identified in traditional models, particularly with regard to education system quality, governance, and the economy’s capacity to absorb human capital. This combination ensures both theoretical depth and an up-to-date perspective on ongoing debates. To preserve coherence, documents were retained only when they provided a clear conceptual argument, an explicit mechanism linking education to growth, or a critical insight into why education spending may yield heterogeneous outcomes across contexts. Works with limited theoretical contribution or weak relevance to the education–growth nexus were not prioritized.

The analytical approach adopted is based on a cross-sectional comparison of theoretical frameworks, highlighting both divergences and complementarities in the ways education is incorporated into the growth process. The analysis seeks to move beyond a strictly quantitative reading of educational investment by emphasizing the conditional nature of its economic impact. It thus allows for the identification of the main transmission channels between public education expenditure and economic growth, as well as the structural and institutional factors that may enhance or constrain these effects. This approach forms the foundation of the analytical framework developed in the following section.

### 3. Literature Review

#### 3.1 Education in Classical Economic Theories

Classical economic theories, developed between the late eighteenth century and the mid-nineteenth century, primarily sought to explain the mechanisms of economic growth through the accumulation of physical capital, the division of labor, and demographic dynamics. Within this analytical framework, education was never considered an autonomous factor of production nor an explicit determinant of economic growth. Its role remained marginal and largely implicit, falling more within social, moral, or institutional considerations than within formalized economic reasoning.

In the work of Adam Smith, education appears indirectly through the analysis of the division of labor, which he identified as the principal source of productivity gains and national wealth (Smith, 1776). While specialization leads to significant improvements in productive efficiency, Smith also emphasized its adverse effects on the intellectual and moral capacities of workers. The repetition of simple tasks tends to impoverish the mind and reduce individual autonomy. From this perspective, basic education serves as a necessary corrective—not to directly stimulate economic growth, but to preserve the social and institutional conditions required for the proper functioning of markets (Smith, 1776). Education is thus conceived as an instrument of social stability that justifies limited state intervention, without being incorporated into the production function.

David Ricardo assigns an even more marginal role to education in his analysis of economic growth. His theoretical framework is based on an essentially quantitative conception of labor, determined by subsistence wages and demographic constraints inherited from Malthusian thought (Ricardo, 1817). Labor is not viewed as a form of capital to be developed, but rather as an adjustment variable in the distributional dynamics between wages and profits. Ricardo nevertheless acknowledges, in a limited and episodic manner, that improvements in education could enhance labor productivity and alleviate certain long-term constraints on economic growth, without integrating this insight into a formal analytical framework (Ricardo, 1817).

Thomas Malthus adopts an even more restrictive stance toward education. In his population theory, he highlights a structural imbalance between population growth and the expansion of resources, leading to a pessimistic outlook on economic development (Malthus, 1798). Education is not perceived as a lever of growth, but rather as a moral instrument capable of encouraging demographic restraint. Although Malthus later recognized that education could promote a “moral restraint” by influencing individual behavior, this function remained essentially normative and disciplinary, with no direct economic implications (Malthus, 1803). A notable shift within classical thought emerges with John Stuart Mill. While remaining anchored in the foundations of economic liberalism, Mill broadened the analytical scope by explicitly integrating education into a more comprehensive reflection on economic and social progress (Mill, 1848). He viewed education as a prerequisite for citizenship, democratic participation, and the qualitative improvement of the labor force. Without formalizing the concept of human capital, Mill acknowledged that higher levels of education could enhance productivity, foster innovation, and improve the economy’s adaptability to structural transformations (Mill, 1848). This recognition, in his view, justified a more active role for the state in financing basic education.

Overall, classical economic thought does not assign education a central role in explaining economic growth. While it recognizes certain indirect functions related to social stability and the qualitative improvement of labor, education is not regarded as a productive investment in the economic sense. This marginalization reflects both the historical context of the period and a still largely static conception of labor, thereby paving the way for subsequent developments within the neoclassical framework. More specifically, it helped shape later—particularly

neoclassical—growth models, which initially treated labor as a largely homogeneous input and therefore tended to overlook education expenditure as an explicit driver of long-run performance. In this sense, the absence of formalization in classical theory contributed to delaying the analytical integration of education into growth models, thereby justifying the emergence of human capital theory, which reframed education as a productive asset generating measurable economic returns.

### **3.2 The Neoclassical Approach and the Growth Residual**

The neoclassical approach to economic growth, developed in the mid-twentieth century, represents a major methodological shift through the introduction of formalized models aimed at explaining long-term dynamics based on aggregate production functions. Despite this analytical advance, education is not incorporated as an explicit factor of growth within this framework, but rather remains confined to an indirect and residual role.

The Solow growth model (1956) constitutes the central reference of this approach. It is based on a production function combining physical capital, labor, and a factor of overall efficiency, commonly assimilated to technological progress. Within this framework, sustained growth in per capita income can only be explained by improvements in total factor productivity, which is assumed to be exogenous. Labor is treated as a homogeneous input, without distinction in terms of skills or educational attainment. Education, training, and learning processes do not appear explicitly in the model and are implicitly absorbed into technological progress.

In its empirical extension, Solow (1957) demonstrates that physical capital accumulation accounts for only a limited share of the growth observed in the United States during the first half of the twentieth century. The bulk of economic growth remains unexplained by traditional factors and is attributed to a residual, famously known as the “Solow residual.” This residual encompasses all unobserved factors affecting productivity, including innovation, work organization, and implicitly, education.

Edward Denison’s work builds on this perspective by seeking to empirically decompose the growth residual in order to identify its specific components. Denison (1962) introduces the average educational attainment of the labor force as an explanatory determinant of labor productivity and per capita GDP. His estimates indicate that improvements in educational levels account for a significant share of U.S. economic growth, ranging between 15% and 20% depending on the period under consideration.

This contribution represents an important step forward in recognizing the economic role of education. However, Denison’s approach remains theoretically limited. Education is measured through quantitative indicators, such as years of schooling, without systematic consideration of learning quality or institutional mechanisms. Moreover, the analytical framework remains exogenous, as education is treated as an additional explanatory factor rather than as a dynamic process of accumulation.

From a modelling standpoint, neoclassical growth theory relies on two key assumptions that constrain the treatment of education expenditure: labor is modelled as homogeneous, and technological progress is assumed exogenous. As a result, differences in skills and schooling are not explicitly incorporated as productive inputs, and the potential contribution of education to productivity improvements is largely absorbed into total factor productivity or the residual term (Solow, 1956, 1957). This implies that public education expenditure is not directly modelled as a policy variable driving long-run growth, but rather as an indirect influence reflected only through productivity changes that remain unobserved within the model.

This framework also leaves the budgetary transmission channel under-specified: higher education spending affects growth only insofar as it can be converted into more effective labor input or higher total factor productivity, without an explicit mechanism linking budget allocations to measurable growth drivers. Finally, while Denison-type decompositions provide

useful evidence, their estimates are sensitive to methodological assumptions (factor shares, input measurement) and to limitations in schooling data, which may overlook learning quality and affect the robustness of results (Denison, 1962).

Thus, while the neoclassical approach gradually acknowledges the importance of education, it continues to assign it a subordinate analytical position. It highlights the contribution of schooling to productivity without providing a theoretical framework capable of fully analyzing the long-term impact of public education expenditure on economic growth. These limitations paved the way for the emergence of human capital theory, which offers a more comprehensive conceptualization of education as a productive investment.

### **3.3 Human Capital Theory: Education as a Productive Investment**

Human capital theory represents a decisive turning point in the economic analysis of education. From the 1960s onward, it introduced a conceptual break with classical and neoclassical approaches by viewing education no longer as a peripheral social variable or an implicit factor of productivity, but as a full-fledged economic investment capable of generating measurable returns at both the individual and collective levels. This framework allows education to be explicitly integrated into growth analysis and provides an economic rationale for public financing of education.

The foundational work of Theodore Schultz (1961) constitutes one of the earliest milestones in this evolution. Schultz argues that improvements in individuals' skills, knowledge, and health enhance their productivity and adaptability to economic change. From this perspective, education expenditures should be analyzed as investments in human capital, comparable to physical capital accumulation, rather than as mere consumption spending. This conceptualization opens the way for an economic analysis of the state's role in financing education, particularly in contexts characterized by imperfect credit markets where individuals are unable to fully finance their own training.

Gary Becker (1964) formalizes this intuition by developing a microeconomic theory of human capital investment based on cost-benefit analysis. Individuals are assumed to choose among educational options by comparing the direct and indirect costs of schooling with expected future gains in the form of higher earnings. Education is thus embedded in a rational choice framework, where it contributes to individual productivity and wage growth. This approach provides a solid analytical justification for educational investment and enables the measurement of private returns to education using individual-level data.

Building on this line of research, Jacob Mincer (1974) proposes an empirical estimation of the returns to education through an earnings function linking wages to years of schooling and work experience. Results derived from this empirical framework consistently show that each additional year of education is associated with a significant increase in individual income. These findings have played a crucial role in establishing the economic legitimacy of education and reinforcing the view that educational investment is a key determinant of long-term economic performance.

Beyond private incentives, human capital theory also provides several justifications for public intervention in education financing. These include positive externalities associated with schooling (productivity spillovers and social benefits), credit market imperfections that restrict households' ability to invest optimally in education, and equity considerations related to equal opportunity and social mobility (Schultz, 1961; Becker, 1964). These arguments imply that the economic rationale for public spending may differ across levels of education: while basic education is often justified by broad social returns and equity objectives, higher education may depend more strongly on innovation capacity, labor-market demand, and the targeted allocation of resources.

However, while human capital theory effectively highlights the private returns to education, its extension to the macroeconomic level raises several limitations. First, the translation of individual returns into social returns is not automatic. Productivity gains observed at the microeconomic level do not necessarily translate into equivalent aggregate growth, due to crowding-out effects, labor market segmentation, or underutilization of skills. Second, the theory implicitly assumes that economies are capable of efficiently absorbing accumulated human capital, which presupposes the existence of a dynamic productive structure and institutions conducive to the effective valuation of skills.

These limitations have been emphasized by several empirical studies highlighting the heterogeneity of social returns to education across countries and levels of schooling. Psacharopoulos and Patrinos (2004) show that returns to education vary substantially between developed and developing countries and depend closely on the quality of educational systems, labor market structures, and the level of institutional development. In certain contexts, increases in public education expenditure may lead to low or even diminishing social returns when the supply of skills exceeds productive demand.

Moreover, human capital theory has been criticized for its predominantly quantitative approach to education, often reduced to years of schooling. Such measures fail to capture learning quality, inequalities in access, or performance gaps across educational systems. More recent research emphasizes that human capital accumulation depends not only on the length of schooling, but also on the effectiveness of pedagogical processes, the governance of educational institutions, and the coherence of public policies (Hanushek and Woessmann, 2008).

In addition, critical perspectives suggest that observed wage premiums may partly reflect signalling or credentialism rather than pure productivity gains, meaning that education can function as a screening device in labor markets. In such cases, higher schooling attainment may improve individual earnings without generating proportional aggregate productivity effects, especially when credentials expand faster than the economy's capacity to create high-skill jobs. Thus, although human capital theory represents a major advance in recognizing the economic role of education, it is insufficient on its own to explain the divergences observed between education expenditure and economic performance. By focusing primarily on educational investment per se, it tends to underestimate the structural and institutional conditions required to transform human capital into productivity gains and sustained economic growth. These shortcomings paved the way for endogenous growth models, which seek to more explicitly integrate the mechanisms through which education, innovation, and knowledge externalities interact in the growth process.

### **3.4 Endogenous Growth Models**

Endogenous growth models, developed from the late 1980s onward, represent a major break with traditional neoclassical approaches by explicitly endogenizing technological progress. Unlike the Solow model, in which technological change is assumed to be exogenous, these models highlight internal mechanisms through which knowledge accumulation, education, and innovation can sustain long-term economic growth. Education thus ceases to be a residual factor and becomes a structuring engine of the growth process.

The model proposed by Lucas (1988) introduces human capital as a central determinant of long-term growth dynamics. In this framework, human capital accumulation results from individual educational choices and generates positive externalities that benefit the entire economy. Education no longer merely enhances individual productivity, but also contributes to knowledge diffusion and to the overall technological level. This mechanism helps explain the absence of diminishing returns and provides a theoretical justification for public intervention in the financing of education. However, the model rests on the assumption of homogeneous and efficient human capital accumulation, without accounting for quality disparities or institutional

constraints. In Lucas's framework, education primarily operates through the accumulation of skills embedded in workers, meaning that growth is sustained by a continuously improving stock of effective labor and its economy-wide spillovers.

From a complementary perspective, Romer (1990) emphasizes the role of education in the production of ideas and technological innovation. Highly skilled human capital becomes an essential input in the research and development sector, fostering the emergence of new technologies and increasing overall productivity. Growth is thus driven by increasing returns to ideas, which differ from physical goods due to their non-rival nature. Education therefore appears as a strategic investment that fuels a cumulative innovation process. Nevertheless, this theoretical framework assumes the existence of competitive markets, strong protection of intellectual property rights, and an environment conducive to innovation—conditions that are rarely met simultaneously in developing economies. Unlike Lucas, Romer places education at the core of knowledge creation: human capital matters less as an input in production itself than as a key resource for generating new ideas and sustaining technological change.

Barro's contributions (1991, 2001) offer a broader integration of education into extended endogenous growth models in which public policies play an ambivalent role. Education is viewed as a factor capable of stimulating growth through human capital accumulation, but its effect depends closely on the composition of public expenditure and the mode of its financing. Barro emphasizes that certain public expenditures can have a positive impact on growth when they support productive investment, while others may generate distortions that hinder capital accumulation and private initiative. This analysis introduces a conditional interpretation of the role of the state and challenges the assumption of a systematically positive relationship between education expenditure and economic growth.

Overall, endogenous growth models make a major theoretical contribution by explicitly incorporating education as an internal driver of economic growth. They go beyond the limitations of neoclassical approaches by demonstrating that educational choices and public policies can durably influence growth trajectories. However, these models tend to assume an efficient and automatic transformation of educational investment into productive human capital, without sufficiently analyzing the institutional, structural, and qualitative conditions required for such a transformation. This limitation opens the way for a more critical perspective centered on the role of institutions, governance, and the quality of educational systems, which is addressed in the following subsection.

### **3.5 Institutions, Governance, and the Effectiveness of Education Expenditure**

The limitations highlighted by endogenous growth models have led to a critical reassessment of the role of education in economic growth, placing greater emphasis on the institutional and governance conditions that determine the effectiveness of education expenditure. This perspective considers that investment in education generates sustainable economic effects only when it is embedded in an institutional environment capable of transforming accumulated human capital into productivity gains and innovation (North, 1990; Sen, 1999).

Within this framework, the capability approach developed by Sen (1999) offers an expanded analytical perspective in which education cannot be reduced to a simple productive input. Rather, it constitutes a fundamental capability that enables individuals to broaden their economic and social opportunities. The effectiveness of education expenditure thus depends on its capacity to enhance autonomy, employability, and participation in economic life. This reading highlights the limits of a strictly quantitative evaluation of education and underscores the importance of institutions in creating an environment conducive to the effective valorization of skills (Sen, 1999; UNESCO, 2020).

The contributions of Aghion and Howitt (1998), followed by Aghion et al. (2009), reinforce this analysis by emphasizing the close interaction between education, innovation, and institutional quality. According to these authors, the impact of educational investment on growth varies depending on a country's distance from the technological frontier. In economies close to the frontier, higher education, research, and advanced training play a central role in innovation-driven growth. Conversely, in economies far from the technological frontier, the effectiveness of education expenditure depends more heavily on the capacity of institutions to promote technological imitation, knowledge diffusion, and entrepreneurship. This distinction helps explain the heterogeneity of the effects of education expenditure across economic contexts (Aghion & Howitt, 1998; Aghion et al., 2009).

The governance of education systems constitutes another essential determinant of public spending effectiveness. A substantial body of research shows that increases in education budgets, in the absence of effective steering, evaluation, and accountability mechanisms, may lead to significant inefficiencies. Problems related to resource misallocation, administrative rigidities, and weak coordination among institutional actors limit the capacity of education systems to produce high-quality human capital. In this context, educational performance depends less on the volume of expenditure than on its composition and management modalities (OECD, 2010). More recent evidence reinforces this argument by emphasizing the importance of performance monitoring, accountability systems, and policy coherence to improve education outcomes and maximize the social returns to public spending (OECD, 2022; OECD, 2023).

World Bank analyses converge toward this conclusion by emphasizing that cross-country differences in economic growth cannot be explained solely by variations in schooling attainment, but rather by disparities in the skills actually acquired by students. Empirical studies based on international assessment outcomes show that learning quality is a stronger predictor of economic growth than average years of schooling (Hanushek and Woessmann, 2008). This approach highlights the central role of education policies focused on quality, teacher training, performance evaluation, and the alignment between education and labor market needs (World Bank, 2018). In the same vein, recent global evidence highlights the persistence of "learning poverty" in developing countries, stressing that expanded access without adequate learning gains can substantially weaken the expected macroeconomic returns of education spending (World Bank, 2019).

Moreover, the capacity of economies to absorb the human capital generated by the education system depends closely on the structure of the productive sector and the functioning of labor markets. In contexts characterized by high graduate unemployment, widespread informality, or limited productive diversification, increases in education expenditure may result in low or even negative economic returns in the short term. Such situations give rise to skill mismatch, brain drain, or underutilization of human capital, thereby reducing the potential impact of education on economic growth (Pritchett, 2001). Recent policy-oriented analyses further stress that the changing nature of work and skills demand reinforces the need for stronger coordination between education systems and labor markets to ensure that education spending translates into employability and productivity gains (World Bank, 2019).

Ultimately, the institutional approach demonstrates that education is not an automatic lever of growth, but a conditional investment whose effectiveness depends on a set of structural and institutional factors. Learning quality, education system governance, policy coherence, and the capacity of the productive sector to valorize skills emerge as central determinants of the relationship between education expenditure and economic growth. This perspective moves beyond purely quantitative approaches and lays the groundwork for the development of an integrated analytical framework in which educational investment is analyzed in interaction with institutions and economic structures.

Overall, this perspective suggests that education expenditure is a growth-enhancing investment only under specific conditions: learning outcomes and effective resource allocation constitute necessary conditions, while sustained growth effects also require sufficient complementary factors such as accountability mechanisms, policy coherence, and the economy's capacity to absorb and valorize skills. In this sense, governance and institutions directly shape the marginal returns to public spending: when institutional quality is strong, additional expenditure is more likely to translate into measurable skill gains and productivity improvements, whereas under weak governance, marginal increases in education budgets may yield diminishing returns due to inefficiencies and limited learning progress (OECD, 2010; World Bank, 2018, 2019).

To synthesize the main theoretical developments examined in this section, Table 1 summarizes the role attributed to education across the major schools of economic growth theory.

**Table 1. The Role of Education in Major Economic Growth Theories**

| <b>Theoretical Approach</b> | <b>Key Authors</b>             | <b>Role Attributed to Education</b>     | <b>Dominant Economic Mechanism</b>                             | <b>Main Limitations</b>                                                         |
|-----------------------------|--------------------------------|-----------------------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------|
| Classical theories          | Smith; Ricardo; Malthus; Mill  | Indirect or social role                 | Social stabilization, labor discipline, institutional cohesion | Lack of economic formalization; education excluded from the production function |
| Neoclassical approach       | Solow; Denison                 | Implicit or partially measured role     | Total factor productivity, growth residual                     | Exogenous technological progress; education not endogenized                     |
| Human capital theory        | Becker; Mincer; Psacharopoulos | Central role as a productive investment | Skill accumulation, increase in individual productivity        | Quantitative focus; limited consideration of institutional factors              |
| Endogenous growth theory    | Lucas; Romer; Barro            | Internal engine of growth               | Human capital externalities, innovation                        | Strong institutional assumptions; non-automatic effects                         |
| Institutional approach      | Sen; Aghion; OECD; World Bank  | Conditional role                        | Learning quality, governance, education–employment alignment   | Strong dependence on economic and institutional context                         |

**Source : Authors**

#### **4. Analytical Framework and Theoretical Discussion**

The theoretical developments presented in the literature review highlight a central observation: although education has gradually assumed a more prominent role in economic growth models, its impact on macroeconomic performance remains conditional and heterogeneous. Classical and neoclassical approaches long relegated education to an indirect role, whereas human capital theory and endogenous growth models sought to integrate it as an explicit driver of growth. However, contemporary critiques emphasize that increases in education expenditure do not mechanically translate into sustained economic growth. This section proposes an analytical framework to interpret these theoretical and empirical divergences.

A first explanatory element lies in the timing of the effects of education expenditure. Education constitutes an investment with delayed returns, involving immediate costs while its economic benefits materialize only in the medium to long term. In the short run, increases in public education spending may exert a constraining effect on growth, particularly when financed through taxation or public debt, potentially crowding out private investment. From this perspective, the negative or insignificant short-term effects identified in several empirical studies do not necessarily indicate inefficiency in educational investment, but rather reflect the time lags inherent in the human capital formation process (Barro, 2001). In addition, the growth impact of education spending depends on fiscal constraints and budgetary sustainability: when

expansion is financed through distortionary taxation or persistent deficits, the net effect may be weakened by reduced private investment incentives, higher debt burdens, or tighter fiscal space, especially in developing economies (Barro, 2001).

A second explanatory mechanism concerns the distinction between quantitative and qualitative human capital accumulation. Human capital theories have long equated education with years of schooling, implicitly assuming a proportional relationship between the duration of education and productivity. However, more recent research shows that learning quality and the skills actually acquired constitute more relevant determinants of economic growth than the mere expansion of schooling (Hanushek and Woessmann, 2008). Within this framework, increases in education expenditure oriented toward quantitative system expansion may generate low economic returns if they are not accompanied by substantial improvements in teaching quality. The economy's capacity to absorb human capital represents a third key factor. Endogenous growth models implicitly assume the existence of a productive structure capable of valorizing skills generated by the education system, particularly through innovation, research, and technological development. However, in economies characterized by limited productive diversification, a dominant informal sector, or segmented labor markets, the supply of skills may exceed productive demand. This mismatch leads to graduate unemployment, occupational downgrading, or skill migration, thereby reducing the impact of education on economic growth (Pritchett, 2001). This also calls for a more critical interpretation of development narratives that implicitly treat education spending as a universal remedy: when the expansion of schooling outpaces the creation of high-productivity jobs, education policies may generate partial failures such as over-education, qualification mismatch, and intensified skilled migration, which reduce the domestic economic payoff of public investment.

Moreover, the governance of education systems emerges as a central determinant of public spending effectiveness. Institutional analyses emphasize that inefficient resource allocation, the absence of evaluation and accountability mechanisms, and weak coordination between educational and economic actors may limit the transformation of educational investment into productivity gains. In this context, the effectiveness of education expenditure depends less on its overall level than on its composition, targeting, and coherence with other public policies (OECD, 2010). More broadly, the composition of public spending matters: education budgets can generate stronger growth effects when they are balanced across levels of education and oriented toward quality-enhancing inputs, while poorly targeted allocations may produce limited marginal returns despite rising expenditure (Barro, 2001).

This analytical framework thus moves beyond a binary opposition between positive effects and the absence of effects of education on growth. It suggests that the impact of public education expenditure is fundamentally conditional, depending on learning quality, institutional arrangements, and economic structure. Education therefore appears as a potential lever of growth, whose effectiveness relies on a set of complementary mechanisms rather than on a direct and automatic causal relationship.

Ultimately, this integrated theoretical perspective provides a relevant analytical lens for interpreting the heterogeneity of empirical results observed in the literature. It also lays the groundwork for empirical analysis aimed at distinguishing short- and long-term effects of education expenditure on economic growth, while taking into account the structural and institutional constraints specific to developing economies.

To clarify the analytical framework developed in this section, Table 2 presents the main conditions determining the effectiveness of public education expenditure on economic growth.

***Table 2. Theoretical Conditions for the Effectiveness of Public Education Expenditure***

| <i>Dimension</i>               | <i>Economic Mechanism</i>     | <i>Expected Effect on Growth</i>            | <i>Key References</i>         |
|--------------------------------|-------------------------------|---------------------------------------------|-------------------------------|
| Productive structure           | Skill valorization            | Sustainable endogenous growth               | Aghion and Howitt (1998)      |
| Institutional environment      | Incentives and coordination   | Transformation of human capital into growth | Sen (1999)                    |
| Education–employment alignment | Human capital absorption      | Reduction in graduate unemployment          | Pritchett (2001)              |
| Learning quality               | Effective skill accumulation  | Increase in total factor productivity       | Hanushek and Woessmann (2008) |
| Education governance           | Efficient resource allocation | Positive social returns                     | OECD (2010)                   |

*Source : Authors*

## 5. Conclusion

This article aimed to analyze the role of public education expenditure in the process of economic growth in light of the main theoretical approaches. Through a structured examination of classical, neoclassical, human capital, endogenous growth, and institutional perspectives, the analysis shows that the relationship between education and growth has progressively evolved, without converging toward a unified or automatic interpretation.

Classical and neoclassical theories long relegated education to an indirect, social, or residual role, either excluding it from the production function or implicitly incorporating it into exogenous technological progress. Human capital theory represents a decisive advancement by conceptualizing education as a productive investment capable of improving individual productivity and earnings. However, this approach tends to privilege a quantitative reading of education, thus underestimating the structural conditions required for transforming human capital into aggregate economic growth.

Endogenous growth models further deepen this analysis by explicitly integrating education as an internal engine of growth through human capital externalities and innovation mechanisms. Nevertheless, their strong assumptions regarding institutional quality, education system effectiveness, and the economy's capacity to absorb human capital limit their explanatory power in contexts characterized by structural rigidities and governance deficiencies. Contemporary institutional and critical approaches therefore emphasize that the effectiveness of public education expenditure depends less on its volume than on its quality, allocation, and articulation with productive structures and economic institutions.

The main contribution of this article lies in highlighting the conditional nature of the impact of education expenditure on economic growth. Education emerges as a potential lever of growth whose effectiveness is contingent upon a set of complementary factors, including learning quality, education system governance, education–employment alignment, and the capacity of the productive sector to leverage acquired skills. This integrated perspective makes it possible to move beyond purely quantitative analyses and to better understand the heterogeneity of results observed in the empirical literature.

These theoretical insights open important avenues for future research. In particular, they call for more in-depth empirical analyses of the differentiated effects of public education expenditure according to time horizon, level of education, and institutional context. Such an approach would allow for a more precise identification of the conditions under which educational investment can sustainably contribute to economic growth, especially in developing economies, where challenges related to quality, equity, and governance remain central.

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