

Human Capital, Education, and Economic Growth in Morocco: An Empirical Investigation

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Abstract

The purpose of our research is to investigate the impact of human capital as a proxy for education on Moroccan economic growth. We mobilize a database derived from the World Bank and Penn World Table for this purpose. According to empirical results based on multiple linear models, human capital is a significant driver of economic growth in Morocco. Other control variables, such as domestic credit provided by the banking sector, savings level, trade openness, government effectiveness, and regulatory quality, also had a positive impact on growth, but their significance was not confirmed. Based on the study, corruption has a negative and significant impact on economic growth. The article's main implications are two-fold. In practice, policymakers will need to invest more in human capital, such as through enrollment and educational quality support. Our study fills a research gap in the literature by analyzing the relationship between human capital and growth in Morocco. Understanding this relationship helps to inform public policies aimed at increasing human capital in order to support growth.

Keywords: human capital, education, economic growth.

According to the OECD (Organization for Economic Cooperation and Development) definition, human capital includes "the stock of knowledge, skills, competencies and individual attributes that enable the creation of personal, social and economic wealth" "Human capital is an intangible asset that can foster or sustain productivity, innovation, and employability." In other words, human capital refers to the knowledge, skills, and abilities of a population that can be used to produce economic goods and services. Increased production of goods and services is referred to as economic growth. Because it can lead to higher output and income through increases in productivity and innovation, human capital is considered a key factor in economic growth. The relationship between human capital and economic growth is complex and can be influenced by a variety of factors such as education, health, and technology.

The rational use of human capital is critical to any nation's economic and social development. Increased worker productivity is one way that human capital contributes to economic growth. In order to improve economic and labor market performance, the number of people engaged in economic activity should be increased. Countries that are successful in increasing their human capital have an advantage over those that are unsuccessful (Hays Global Skills Index, 2015). The rate of return on human capital investment is high and increases with the level of human capital, which means that countries with higher levels of human capital tend to grow faster than countries with lower levels (Eric Hanushek, Edward L. Glaeser, David N. Weil, Paul Romer, Adama K. Kamara, John A. Osei). and this is where the role of education comes in: When individuals have higher levels of education and training, they are able to perform their jobs more efficiently, which can lead to higher output and income. In addition, a healthy, educated population is

more productive and can work more efficiently and effectively. Consequently, investments in education, health, and training can lead to higher productivity and economic growth. Another way human capital contributes to economic growth is through innovation. When people have the knowledge and skills to develop new technologies and products, they can create new industries and spur economic growth. Innovation also leads to higher productivity because new technologies and methods can be more efficient than older ones. Human capital also plays an important role in attracting foreign investment and creating a more competitive economy. Countries with well-educated and skilled populations are more attractive to foreign investors and companies, which can lead to an influx of capital and an increase in economic growth.

There is a broad consensus in the literature on long-term growth that the accumulation of human capital and knowledge plays an important role in the economic development process. Empirical evidence suggests that one of the reasons for growth differentials across countries lies in quantitative and qualitative differences in human capital resources. Human capital is an additional factor of production that plays an important role in the equilibrium of the neoclassical growth model in an endogenous growth context. Human capital can also play a productive role in terms of its ability to absorb new technologies. Empirical evidence on growth shows that a one-year increase in the average educational level of the population increases per capita output by about 6% in the long run (Canton & al. 2005). Since the emphasis on human capital as a driver of economic growth in most developing countries, including Morocco, there has been an overemphasis on academic achievement as well as cognitive skills. Increase the focus on school quality issues (Hanushek, 2013).

Overall, Human capital is a key driver of economic growth and development. Human capital accumulation would result in increased productivity, which would promote growth and employment. Since Adam Smith, most academics have recognized that a country's human capital competence is one of its most important competitive assets. Investing in education, and training can result in increased productivity and innovation, which can fuel economic growth.

Boosting human capital would hasten structural change while also supporting output growth and, in turn, long-term global socioeconomic development by raising standards of living. The development models that have been adopted continue to operate at the periphery of their inclusive potential, particularly in terms of generating decent employment and reducing social, geographic, and gender disparities. Presently, new development strategies are articulating their goals while taking into account the issue of quality and inclusivity.

This paper is organized as follows. We begin with a review of the literature (**section I**), followed by the empirical methodology used to test the empirical validity of our research hypotheses (**section II**), the empirical results obtained and their discussion (**section III**), and finally with some closing remarks (**section IV**).

1. Literature review

The theme of economic growth is one of the most fundamental issues in macroeconomics. Several economists have attempted to explain the phenomenon of economic growth throughout the history of economic theory, most notably in the early twentieth century with the studies of the two Keynesians Harrod and Domar (1940), who considered investment as the motor for growth. They looked at how investment affected the general equilibrium. They were able to distinguish between two types of investment effects: an income effect caused by an increase in national income and a capacity effect caused

by an increase in the productive system's capacity. Following this research, a growth theory emerged in the scientific community, which is still regarded as one of the most significant theories in history and has since served as the standard for all subsequent attempts to model the growth phenomenon. Exogenous growth is a concept that Robert Solow, an economist who won the 1987 Nobel Prize, developed.

A number of models that attempt to explain economic growth, including the endogenous growth models created by a group of authors, have their roots in Solow's model, which is the founding model of the economic growth theory (Paul Romer, Robert Lucas and Robert Barro). The approach taken by the various proponents of this theory in selecting the sources of favorable externalities to production varies (Guellec D et al. 2003).

In an effort to address the criticism of exogenous growth theory, which does not explain the sources of growth, growth theory underwent a revival in the 1980s and 1990s. The newly proposed models privilege the role of knowledge acquisition and research in their explanation of the sources of growth. They take into account the potential for long-term differences in living standards between nations. They draw attention to the likelihood of rising returns in a market that is competitive.

Analytically, these models aim to make a regular regime's growth rate dependent on consumer preferences, with their choice directing the regime's evolution. Due to this, the growth in question is referred to as endogenous because the rate of growth is determined by the individual consumers and owners of the production-related inputs. The fact that all of the models aim to show that balanced endogenous growth exists is what unites them. Their emphasis on particular sources of growth varies. According to models that emphasize the role of technological innovation, it depends on the diversification of goods, whether they are consumer goods (Grossman and Helpman, 1991), intermediate goods (Romer, 1990), or intermediate goods that are gradually replaced by systematically more efficient goods (Aghion & Howitt, 1992). The emphasis is then placed on research and development (R&D) activity that reacts to financial prospects and takes into account market dynamics. These models, which primarily focus on innovation activity, portray growth as the outcome of R&D spending incentives in relation to consumer preferences and within the constraints of the labor resource allocation between this innovation activity and the production activity (Gaffard, J, L. 2011). In fact, the new theories of economic growth, which include Romer, Barro, and Lucas, have made use of the human capital theory to explain economic growth.

In the 1960s, Theodor Schultz and Gary Becker, two Chicago School economists, developed the concept of human capital. Gary Becker's model of human capital is a seminal contribution to the economic theory of human capital and economic growth. Becker's model assumes that human capital, like physical capital, is a form of investment that creates future income. According to Becker, human capital is not limited to formal education, but includes all investments in a person's human capabilities, such as on-the-job training, health, and experience. In terms of economic growth, Becker's model assumes that an increase in human capital leads to an increase in economic growth. The model assumes that human capital, like physical capital, is an important determinant of economic growth and that an increase in human capital leads to an increase in productivity, which in turn promotes economic growth (Olivier Monso 2009). Many economists have built on Becker's model of human capital to develop more sophisticated models of human capital and economic growth. Some notable examples are: Jacob Mincer and Solomon Polachek's 1981 paper "Family Investments in Human Capital: Earnings of Women" They developed a model that examines the relationship between family investments in human capital and women's earnings. They argue that family investments in education, training, and other forms of human capital can have a significant impact on women's earnings. They also show that the returns to human capital investment are higher for

women than for men. Gary S. Becker and Kevin M. Murphy, in their 1992 paper "The Division of Labor, Coordination Costs, and Knowledge," proposed a model that explains how the division of labor and the coordination costs of production are related to the accumulation of knowledge and skills. They argue that when coordination costs are low, it is more efficient for different tasks to be performed by different people, leading to a greater division of labor and more specialized workers. This, in turn, leads to an accumulation of knowledge and skills, which increases productivity. In his 1994 paper "Output Measurement in the Service Sectors," Zvi Griliches addressed output measurement in the service sector and the difficulties in measuring productivity growth in these sectors. He argued that conventional methods of measuring output, such as value added, are not well suited to the service sector and proposed alternative methods that take into account the characteristics of the service sector. In 2000, Edward P. Lazear proposed a model in his paper "Performance Pay and Productivity" that explains how performance-based pay can increase productivity. He argues that workers who are offered incentives for good performance will work harder and be more productive. He also argues that performance-based pay can lead to higher investment in human capital because workers have an incentive to acquire skills and knowledge that help them perform better.

By incorporating factors such as education, on-the-job training, and technology into their models, these economists have contributed to the study of human capital and its relationship to economic growth.

2. Data and methodological aspects

The goal of this paper is to look into the impact of human capital on Moroccan economic growth. We have mobilized data from 2004 to 2019. The data originates from the Bank and Penn World Tables databases. To investigate the relationship between human capital and economic growth, we will mobilize a multiple linear regression model, whose dependent variable is the one that captures The logarithm of the sum of value added per capita, and controlling the model by a set of independent variables from the theoretical and empirical literature.

$$.Economic\ Growth_t = \beta_0 + \beta_1 * Human\ Capital_t + \sum_{k=2}^{14} \beta_k * X_{t,k} + u_t$$

The indicators that measure human capital and economic growth are drawn from the theoretical and empirical literature (table 1).

Table 1: Study variables

<i>Variables</i>	<i>Content</i>	<i>Data sources</i>
1) Dependent variables		
<i>Ln (GDP per capita)</i>	The logarithm of the sum of value added per capita.	World Bank database
2) Control variables		
<i>Domestic credit provided by the banking sector (% ofGDP)</i>	Refers to financial resources provided by the banking sectorin percentage of GDP.	

<i>Inflation (in % per year)</i>	Measures the annual change in the cost of a basket of products and services.	World Bank database
<i>Openness rate (in % of GDP)</i>	Exports plus imports as a percentage of GDP.	
<i>Population growth (% per year)</i>	The annual growth rate of the population.	
<i>Investment (% of GDP)</i>	Measures the total value of gross fixed capital formation, minus disposals of a unit or sector, as a percentage of GDP.	
<i>Savings (in % of GDP)</i>	Is gross income minus final consumption expenditure after taking into account an adjustment for pension funds.	
<i>Public expenditure (% of GDP)</i>	Operating expenses incurred by the government for the provision of goods and services.	
<i>Human capital level</i>	Human capital index based on years of schooling and educational attainment.	Penn World Tables v 9.0
3) Institutional Quality		
<i>Voice and Accountability</i>	A variable that captures how the society's citizens express their preferences and rights	The Worldwide Governance Indicators (WGI)
<i>Political Stability and Absence of Violence/Terrorism</i>	A variable that measures the perceived probability of experiencing both political instability and / as well as politically driven violence, which includes terrorism	
<i>Government Effectiveness</i>	A variable that informs on the public service quality as well as policy design, implementation and government's trustworthiness	
<i>Regulatory Quality</i>	A variable that captures institutional quality	
<i>Rule of Law</i>	A variable that provides information on the law enforcement in the country and whether citizens, leaders, legislators and institutions	

	respect the law, i. e. the country's political philosophy	
<i>Control of Corruption</i>	A variable that captures the effectiveness of a country's institutional framework towards tackling corruption	

Source: Authors' elaboration

3. Empirical results and discussion

The findings of our investigation into the link between economic growth and human capital are presented in this section. According to the empirical findings of our multiple linear regression model, in the Moroccan case, human capital drives growth. To avoid the issue of multicollinearity between these variables, we ran six different estimates and included variables on Moroccan institutional quality.

The impact of the other control variables on Moroccan economic growth varies. The amount of variable domestic credit provided by the banking sector (as a percentage of GDP) has a positive and significant impact on Morocco's economic expansion. The same is true for trade openness, government effectiveness, savings levels, and regulatory quality, though the statistical significance of these last three variables has not been confirmed. One of the most important results of our study is that corruption negatively and significantly affects economic growth.

Table 2: The impact of education on economic growth

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: Ln (GDP per capita)						
<i>Human capital index (proxy of education level)</i>	1.056***	1.084***	1.111***	1.126***	1.050***	1.190***
	(0.119)	(0.137)	(0.142)	(0.120)	(0.122)	(0.0974)
Domestic credit provided by the banking sector (% of GDP)	0.00223	0.00289	0.00320	0.00239	0.00342	0.00369**
	(0.00199)	(0.00210)	(0.00208)	(0.00185)	(0.00200)	(0.00142)
Public expenditure (% of GDP)	-0.00224	-0.00191	-0.000479	-0.000638	-0.00173	-0.000895
	(0.00127)	(0.00139)	(0.00211)	(0.00133)	(0.00122)	(0.000918)
Savings (in % of GDP)	0.00694	0.00812	0.00557	0.00266	0.00543	0.00771
	(0.00579)	(0.00761)	(0.00627)	(0.00598)	(0.00594)	(0.00426)
Openness rate (in % of GDP)	0.000831	0.000621	0.000966	0.00114	0.000521	-0.000341
	(0.000903)	(0.00103)	(0.00102)	(0.000898)	(0.000940)	(0.000762)
Investment (% of GDP)	-0.00189	-0.00182	-0.00271	-0.00453	-0.00514	-0.00513
	(0.00569)	(0.00628)	(0.00622)	(0.00569)	(0.00651)	(0.00433)

Inflation (in % per year)	-0.00286 (0.00550)	-0.00328 (0.00669)	-0.00273 (0.00596)	0.000489 (0.00545)	-0.000875 (0.00567)	0.000693 (0.00411)
Population growth (% per year)	0.211 (0.168)	0.169 (0.184)	0.0185 (0.241)	0.0340 (0.167)	0.132 (0.162)	0.0898 (0.118)
Voice and Accountability	-0.0789 (0.0635)					
Political Stability and Absence of Violence/Terrorism		-0.0344 (0.0776)				
Government Effectiveness			0.0994 (0.137)			
Regulatory Quality				0.110 (0.0723)		
Rule of Law					-0.0676 (0.0611)	
Control of Corruption						-0.105** (0.0370)
Constant	5.530*** (0.439)	5.512*** (0.536)	5.684*** (0.474)	5.801*** (0.430)	5.751*** (0.459)	5.512*** (0.320)
Observations	16	16	16	16	16	16
R-squared	0.997	0.996	0.996	0.997	0.997	0.998

The results of this study suggest that human capital, which includes the education and skills of the labor force, is a key factor in economic growth in Morocco. This result is consistent with the notion that a well-educated and skilled workforce can increase productivity and innovation, leading to higher economic growth. Our finding is similar to that of a study published in the Journal of Economic Growth, which found that human capital is an important driver of economic growth and that countries with higher levels of human capital tend to have higher growth rates. Another study published in the Journal of Development Economics concluded that investment in human capital through education and training programs can lead to higher economic growth and poverty reduction. A World Bank study concluded that improving education and workforce skills in Morocco is a key factor in promoting economic growth and reducing poverty. According to the study, Morocco can achieve its goal of becoming a middle-income nation by investing in its human capital. Another study conducted by the African Development Bank found that while Morocco has made great strides in expanding educational access, there is still room for improvement in terms of educational quality as well as spending on lifelong learning and vocational training to improve the employability of the workforce.

According to a study by the Institute of International Education, Morocco has implemented various policies and programs to improve the education system and human capital, such as the National Initiative for Human Development and the National Pact for Education and Training. These policies have helped

increase enrollment rates in primary and secondary education, but there is still room for improvement in terms of the quality of education and the link between education and the labor market.

The study also found that other factors such as domestic lending by the banking sector, the level of savings, trade openness, government effectiveness, and the quality of regulation have a positive impact on economic growth in Morocco. These results suggest that a strong banking sector, high savings rate, open trade policy, and effective government and regulation can contribute to a more robust economy. In addition, the study found that corruption has a negative and significant impact on economic growth. This finding highlights the importance of curbing corruption to promote economic growth. Corruption can lead to a loss of trust in government and institutions, discourage foreign investment, and create an uneven playing field for businesses.

Overall, the findings of this study highlight the importance of investing in human capital (education, health...), promoting a strong banking sector and savings rate, implementing open trade policies, and reducing corruption in order to promote Moroccan economic growth.

Based on the results of this study, the following policy recommendations can be made to promote economic growth in Morocco:

1. **Invest in human capital:** The study found that human capital is a significant driver of economic growth in Morocco. Therefore, the government should prioritize investments in education and training programs to increase the skills and productivity of the workforce. A population with more education is more productive, which raises economic output and living standards. As a result, funding education is considered a crucial strategy for fostering economic expansion. Furthermore, a population with more education is more likely to be creative and adaptable to changes in the economy, both of which can promote growth.
2. **Strengthen the banking sector:** The study found that domestic credit provided by the banking sector has a positive impact on economic growth. The government should take steps to strengthen the banking sector, such as implementing regulations to promote stability and encourage competition.
3. **Increase savings rate:** The study found that the level of savings has a positive impact on economic growth. The government should promote savings through financial literacy campaigns and by providing incentives for individuals and businesses to save more.
4. **Promote open trade:** The study found that trade openness has a positive impact on economic growth. The government should continue to negotiate trade agreements and reduce trade barriers to increase access to foreign markets.
5. **Improve governance:** The study found that government effectiveness and regulatory quality have a positive impact on economic growth. The government should focus on improving governance by implementing policies and regulations that promote transparency, accountability, and efficiency.
6. **Reduce corruption:** The study found that corruption has a negative impact on economic growth. The government should take measures to reduce corruption, such as implementing anti-corruption laws and regulations, strengthening oversight and accountability mechanisms, and increasing transparency in government operations.

These recommendations, if implemented, will help to promote economic growth in Morocco, by creating a more favorable environment for businesses, increasing productivity, and reducing corruption.

4. Conclusion

In conclusion, this study examined the relationship between human capital and economic growth in

Morocco. The results of the multiple linear regression model showed that human capital is an important driver of economic growth in Morocco. Other control variables, such as domestic lending by the banking sector, the level of savings, trade openness, government efficiency, and the quality of regulation, also had a positive impact on growth. In addition, the study found that corruption had a negative and significant impact on economic growth.

Based on these findings, policy recommendations were made to promote economic growth in Morocco, including investing in human capital, strengthening the banking sector, increasing the savings rate, promoting open trade, improving governance, and reducing corruption. These recommendations, if implemented, will help create a more favorable environment for business, increase productivity and curb corruption, ultimately leading to a more robust economy.

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