L’IMPACT DES INDICATEURS MACRO-ECONOMIQUES DES SECTEURS D’EDUCATION ET DE SANTE DANS L’AMELIORATION DE LA CROISSANCE ECONOMIQUE

THE IMPACT OF MACROECONOMIC INDICATORS OF THE EDUCATION AND HEALTH SECTORS IN IMPROVING ECONOMIC GROWTH

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Résumé
Cette recherche examine l’impact des indicateurs macroéconomiques dans les secteurs de l'éducation et de la santé sur la croissance économique. Elle se base sur une méthodologie utilisant des équations structurelles et collecte des données auprès de professionnels de ces secteurs. Les résultats indiquent que les indicateurs immatériels jouent un rôle de variable modératrice entre les indicateurs de structure et les indicateurs de processus et de résultats finaux, avec une relation significative entre les indicateurs de processus et de résultats finaux et la variable modératrice. Cette recherche contribue à comprendre comment ces indicateurs peuvent améliorer la croissance économique.

Mots-clés : indicateurs macroéconomique, croissance économique, secteur d’éducation, secteur de santé, attractivité.

Abstract
This research explores the impact of macroeconomic indicators in education and health on economic growth. It examines whether government investments in these sectors can enhance labor productivity, reduce healthcare costs, and increase labor force participation. The study also analyzes the influence of public policy and identifies a significant relationship between process and result indicators, moderated by intangible indicators, as well as a satisfactory relationship between the moderator variable and the indicators of economic growth improvement.

Keywords: macro-economic indicators, economic growth, education sector, health sector, attractiveness.
Introduction
A company cannot focus solely on the bottom line. The measurement of internal and external indicators is essential to give meaning to the overall objective of the group. Crisis management and public policies can no longer be limited to a hunt for quick fixes. All of the country's potential and resources must be harnessed in order to build a new development model that can strengthen the sources of sustainable, long-term and, above all, inclusive economic growth. New standards of behavior and economic structure must be established and implemented.

There have been a number of changes in the way economists and financiers measure prosperity. There was a time when the total value of states was recorded on the basis of their GDP, itself derived from their natural resource wealth. The three conditions necessary for prices to accurately reflect all marginal utilities of goods and services are (1) complete and accurate recording of all goods and services over a period of time, (2) accurate valuation of the effort expended to obtain those goods and services, and (3) complete and accurate valuation of the effort expended to obtain those goods and services. No, none of these things are true (Perroux, 1949). This is done without a solid understanding of additional measurement indicators addressing both quantitative and qualitative aspects of sustainability.

To better guide the country's economic development, King Mohammed VI of Morocco has called for an assessment of global and intangible wealth based on the multiple forms of intangible capital (IRES, 2015). Indeed, defining methods for assessing the performance of developing resources, especially immaterial ones, is one of the fundamental puzzles of the present. This contribution extends the temporal dimension of the evaluation of intangible wealth over the period from 1990 to 2020 and integrates several measures of intangible capital to meet certain measurement constraints (most notably the omission of certain variables). At this stage our problem is as follows: To what extent can macroeconomic indicators of the education and health sectors improve economic development?

The first step in solving our problem is to gather the scientific data presented in the first phase of the literature review; from there, we can operationalize the variables and elements we have identified and use them in aconfirmatory study, which will confirm or disconfirm the hypotheses we have formulated indirectly.

I. LITERATURE REVIEW
Although it is ranked quite low in development indicators, the persistent rise of the Moroccan economy over the last decade may give hope for an economic boom in this country and the
beginning of an improvement in the quality of life of its inhabitants. This paper attempts to draw parallels between the development of the Moroccan economy from independence until 2019 (before Covid) and some of the early theories of economic growth and change, including Nurkse's vicious circle of poverty theory, Lewis's dual economy theory, Rostow's economic backwardness theory, and Prebisch's structuralist theory. Based on the results of this analysis, it is clear that the Moroccan economy has some similarities with these assumptions while also presenting some key differences. The complexity of underdevelopment is confirmed by this research.

1.1 THE IMPORTANCE OF MACROECONOMIC INDICATORS IN ECONOMIC GROWTH

In trying to understand how the economy works from the perspective of all the people in it, macroeconomists need indicators to diagnose the state of the economy and, if necessary, suggest economic policies. These three indicators are the most widely used:

Two schools announce the importance of macroeconomic indicators in improving economic growth, we note:

The dependency school

As the remedies to poverty proposed by the structuralists did not work, a more radical school of thought emerged. The old structuralists (Furtado, Sunkel, Falleto, etc.) and the neo-Marxists are all part of this dependency school (Emmanuel, Baran, Amin, etc.). Dependence on agriculture (because the majority cannot guarantee food self-sufficiency), trade (because the poor are forced to sell commodities and buy manufactured goods), technology and finance are the four main causes of poverty in the world's poorest countries (indebtedness to the countries of the Center).

The second pattern occurs when resource-rich developed nations capture, through trade, the labor-intensive manufacturing of low-income developing nations, forcing developing nations to pay higher prices for imported goods (Emmanuel, 1969).

Furthermore, with the help of trade, capitalism can increase its global accumulation (Amin, 1971). Although this may pave the way for a new modern industry, in practice it only means the spread of capitalism and the acceleration of underdevelopment. The break with the capitalist system and the uprising against the bourgeoisie are necessary for the classes on the periphery to take and redistribute power. Overall, these ideas involve to varying degrees the developed countries and the liberal model when it comes to explaining underdevelopment by external sources (the countries of the Center).
In this article, the authors examine the historical reasons for underdevelopment. This brief overview of the early explanatory hypotheses of poverty will serve as a baseline for comparing the development history of the Moroccan economy, and we will test the extent to which Morocco's situation fits each of the economic theories presented below. Highlight the ways in which the latter theory differs from these others, if at all.

**The Structuralist School**

A group of social scientists at the United Nations Economic Commission for Latin America (ECLAC), led by Prebisch, organized a school. These authors classify nations on a global scale into two broad categories: central nations and peripheral nations.

To produce in a diversified manner, with high added value and high complementarity between the different economic sectors, the former have homogeneous production structures (a general diffusion of technical progress throughout the economy); to produce in a diversified manner, the latter have heterogeneous production structures (the juxtaposition between a modern sector and an archaic sector), with low sectoral complementarity and low added value;

For these economists, the problem of global poverty is rooted in the inability of the periphery to participate fully in the global economy. However, they also place historical responsibility on the developed nations at the center, arguing that they should have done more to help developing nations benefit from their technological advances.

The countries of the periphery can only escape poverty by becoming more dependent on the developed nations at the center of the world. This breakthrough is achieved through a state-led approach to industrialization (import substitution industrialization, or ISI) and regional cooperation among developing nations. Many nations (Argentina, Chile, etc.) will implement these suggestions, but they will all fail miserably. Because of the nature of the imports (capital goods) needed to implement ISI, they will only exacerbate the degree of dependence of these nations on the industrialized countries.

**1.2 THE EDUCATION AND HEALTH SECTORS: ECONOMIC HUBS**

Morocco has succeeded in integrating the fruits of reforms and the achievements of the recent past into its economic development model. This model has been based on consolidating endogenous growth by strengthening public investment, improving citizens' purchasing power, and continuing the process of diversifying and improving the competitiveness of the productive fabric.

This support for growth fundamentals has been coupled with efforts to improve the profile of public finances and support sectoral strategies for better involvement of the business
community. Nevertheless, the latest global economic and financial crisis has highlighted the structural weaknesses of our economy, which may constitute an obstacle to the achievement of sustainable and inclusive growth in the medium and long term.

These weaknesses concern, in particular, the negative contribution of the foreign trade to the economic growth, because of the limits and the slowness of the process of diversification of the exportable offer combined with the important weight of the imports, the strong energy dependence, the weak performance of the national educational system, the weak adequacy between the training and the employment and the lack of coordination, convergence and integration of the sectoral strategies which limits their effectiveness and their effective impact on the citizen. Aware of the importance of these challenges, the public authorities have set about designing and implementing new measures to deal with this situation.

1.3 INDICATORS OF SECTOR PERFORMANCE (HEALTH SECTOR)

It is therefore important to emphasize the multidimensional nature of this concept and, where possible, to make the characteristics chosen for evaluation (e.g., quality of care and cost-effectiveness) obvious before designing indicators that represent these dimensions. Since the seminal work of (Donabedian, 1980), it has been standard practice in the health care sector to separate structural indicators, which represent the personnel, infrastructure, and financing required to provide quality care to patients (e.g., full-time equivalent personnel by activity).

-Process indicators, which focus on how activity areas are managed and coordinated, as well as the professional techniques used for patient care.

End-of-process indicators that reflect the results of accounting, budgeting and operational mediation.

In quantitative terms, they characterize a facet of the situation or a change over time. Their use is part of a strategy to achieve an objective while operating within a certain framework. They must be calculated and analyzed in the context of the chosen definitions and field of study. However, most research on indicators is conducted in isolation, without the benefit of a theoretical framework or broad perspective, making it impossible to draw meaningful conclusions about the "success" of the area under study.

Hypotheses

Thus, the hypotheses of this research are as follows:

H1: Structural indicators related to the health sector improve Moroccan economic growth

H2: Process and final outcome indicators related to the health sector improve Moroccan economic growth
H3: Health sector-related intangible indicators improve Moroccan economic growth

H4: Structural indicators related to the education sector improve Moroccan economic growth

H5: Process and final outcome indicators related to the education sector improve Moroccan economic growth

H6: Process and final outcome indicators related to the education sector improve Moroccan economic growth

2. METHODOLOGY

According to the literature review related to our problem, it is important to carry out a quantitative study in order to confirm the validity of the explanatory variables. In this respect, we used the structural equation method. This is a type of statistical analysis used to validate a hypothesis regarding a certain occurrence (Byrne, 2016). By "theory" we mean a multivariate causal explanation mechanism.

In this case, we can turn to principal component analysis to find the solutions. In truth, principal component analysis (PCA) is a well-established dimension reduction technique that can be used to convert highly connected variables into brand new variables that are not related to each other.

In general, it works as follows: It is simply a matter of reducing all the data in a massive database to a small set of artificial variables (the "principal components"). In order to have a simple representation of our data, we should be able to project these points onto the nearest hyperplane.

PCA could be used to find the most important economic variables in a given economy, such as the inflation rate, economic growth rate, unemployment rate and interest rate, and group them into one or more principal components. It can also be used to compare the economic state of different countries by reducing multiple macroeconomic variables to a smaller set of principal components that could be compared across countries.

Overall, PCA could be a useful tool for economists and policymakers seeking to analyze large-scale economic data and draw meaningful conclusions.

2.1 CHARACTERISTICS OF SAMPLE

Convenience sampling involves selecting participants based on their accessibility, availability, or willingness to participate in the study. In this case, hospital directors would be selected...
because of their knowledge and experience in the areas of education, health, and economic growth.

However, it should be noted that convenience sampling may bias the results of the study, as the selected participants may not be representative of the total population. Therefore, it is recommended that other sampling methods be used to ensure the validity of the results.

Information is necessarily lost when the dimensions are reduced. The objective of a principal component analysis is to take these data and reduce their dimensions while retaining as much useful information as possible.

Our basic sample is based on professionals in the education and health sector, we have chosen two targets, namely: hospital managers (15 responses) and managers of private schools in the higher education system (15 responses), we project to both targets a confirmatory questionnaire via google forms of which we have implicitly established a system of registration of items according to table 1.

Table 1: Presentation of indicators related to the health and education sectors

<table>
<thead>
<tr>
<th>Grouping of indicators</th>
<th>The indicator</th>
<th>The Symbol</th>
<th>Theorists (literature review)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Rate of new projects in the sector</td>
<td>IS2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Rate of direct investment in the sector</td>
<td>IS3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The rate of informal in the sector</td>
<td>IS4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The annual turnover achieved</td>
<td>IPRF2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The implemented taxation</td>
<td>IPRF3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The subsidies of the State de l'Etat</td>
<td>IPRF4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The rate of trust</td>
<td>LIA2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The rate of commitment to sustainable development</td>
<td>LIA3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Transparency</td>
<td>IACE1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- High significance in relation to the indicators</td>
<td>IACE2</td>
<td></td>
</tr>
</tbody>
</table>

Source : Construction authors
Afin d’appliquer les variables explicatives des indicateurs d’amélioration de la croissance économique nous tenons à illustrer notre modèle final de l’étude qui s’exprime dans la figure 1 présentée ci-dessus :

**Figure 1: The first purification by the principal component analysis method**

We can see from the figure above that the structure indicators are less significant in relation to the model as a whole because its components (items) have experienced a significance below the acceptance threshold (0.70 degrees). For the variable related to "process and final result indicators" we see that all the items are significant except for the item "IPRF" which is presented with 0.543.

3. RESULTS AND DISCUSSION

Our research shows that structural and cyclical macroeconomic indicators have a performance component. It takes a broad and global perspective on the use of economic indicators in the context of national and international statistical initiatives.

For intangible indicators, they represent a moderating variable between structural indicators and process and final outcome indicators. They estimate a significant relationship between the "process and final outcome indicators" variable and the moderator variable. On the other hand, we observe the existence of a satisfactory relationship between the moderator variable
and the variable to be explained "the indicators of improvement of economic growth" (Cronbach’s alpha of 0.839).

Parallel to the work of Couix (2021), macroeconomic indicators related to economic growth may be relevant but only if narrower econometric studies are approved.

Thus, the acceptance/rejection results are as follows:

**Table 2: Acceptance/rejection presentation of the research hypotheses**

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Sig</th>
<th>Acceptance/rejection</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: Structural indicators related to the health sector improve Moroccan economic growth</td>
<td>0.0985</td>
<td>Rejection</td>
</tr>
<tr>
<td>H2: Process and final outcome indicators related to the health sector improve Moroccan economic growth</td>
<td>0.0032</td>
<td>Acceptance</td>
</tr>
<tr>
<td>H3: Intangible indicators related to the health sector improve Moroccan economic growth</td>
<td>0.0013</td>
<td>Acceptance</td>
</tr>
<tr>
<td>H4: Structural indicators related to the education sector improve Moroccan economic growth</td>
<td>0.394</td>
<td>Rejection</td>
</tr>
<tr>
<td>H5: Process outcome indicators related to the education sector improve Moroccan economic growth</td>
<td>0.000</td>
<td>Acceptance</td>
</tr>
<tr>
<td>H6: Final outcome indicators related to the education sector improve Moroccan economic growth</td>
<td>0.000</td>
<td>Acceptance</td>
</tr>
</tbody>
</table>

*Source: Authors*

3.1 CONCLUSION OF HYPOTHESIS

Based on the given significance levels, we can conclude that hypotheses H2, H3, H5, and H6 are accepted, while hypotheses H1 and H4 are rejected. This means that process and final outcome indicators in both the health and education sectors have a significant positive impact on Moroccan economic growth, while structural indicators have no significant relationship with economic growth in either sector.

The significance of the results is a crucial point for our study. This is presented in the table above which reports a definitive conclusion of the retained hypotheses. In this respect we practice an approach of significance fixed in the normal threshold fixed in 0.05. Through this norm, we accept the tests superior or equal to 0.05 and we reject the hypotheses having a threshold less than 0.05. In fact, the scientific procedure of the principal components analysis
requires the analysis of the direct, indirect and specific effects in order to answer the control relations of the dimensions of the research study.

First, we present the indirect effects between the dimensions of the research model and we observe the strong relationship between the dimension of structural indicators and intangible indicators and between intangible indicators with the indicators of improvement of economic growth so there is a significant relationship between the effect of moderation of intangible indicators and the variable to be explained "indicators of improvement of economic growth" (significance rate less than 0. On the other hand, the relationship between the indicators of process and final results with the variable "intangible indicators" is not significant (0.0074 less than the normal rate 0.05).

**Table 3: Presentation of the effects of the model dimensions**

<table>
<thead>
<tr>
<th>Initial sample (O)</th>
<th>Sample average (M)</th>
<th>Standard deviation (STDEV)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process and end result indicators</td>
<td>0,1510</td>
<td>0,1871</td>
<td>0,1454</td>
</tr>
<tr>
<td>Intangible indicators</td>
<td>-0,1220</td>
<td>-0,0476</td>
<td>0,1729</td>
</tr>
<tr>
<td>Structure indicators</td>
<td>0,5358</td>
<td>0,5461</td>
<td>0,1039</td>
</tr>
<tr>
<td>Intangible indicators</td>
<td>-0,0904</td>
<td>0,0751</td>
<td>0,1297</td>
</tr>
<tr>
<td>Indicators for improving economic growth</td>
<td>-0,0904</td>
<td>0,0751</td>
<td>0,1297</td>
</tr>
</tbody>
</table>

**Source : Smart PLS**

The third row shows the effect of intangible indicators on indicators for improving economic growth. The initial sample indicated a positive effect (0.5358), which remained similar in the sample average (0.5461). The standard deviation was 0.1039, and the value was 0.0000. The fourth row shows the moderating effect of intangible indicators. The initial sample indicated a negative effect (-0.0904), which increased to 0.0751 in the sample average. The standard deviation was 0.1297, and the value was 0.0005.

Overall, the table suggests that process and end result indicators have a positive effect on intangible indicators, while structure indicators have a negative effect. Intangible indicators have a positive effect on indicators for improving economic growth, and their moderating effect is significant.

It appears that there is variation in the levels of intangible indicators across the different categories listed. The intangible indicators in the process and end result category have a higher sample average than those in the structure category. Additionally, the intangible
indicators have a larger degree of variability in the process and end result category than in the structure category, as indicated by the higher standard deviation. The intangible indicators also have a strong relationship with indicators for improving economic growth, as evidenced by the high sample average for this category. It is important to note that the moderate effect category serves to moderate the relationship between intangible indicators and economic growth, although the sample average for this category is relatively low.

Overall, these findings suggest that intangible indicators are important for promoting economic growth, and that policymakers should consider focusing on improving these indicators in order to achieve their goals. However, the relationship between intangible indicators and economic growth may be nuanced and may be influenced by other factors, which must be carefully considered when formulating policy.

Our results indicate that there is no consistent relationship between the estimation of structural and non-material indicators. The increase in labor productivity and the acceleration of economic expansion are two results of the presence of this wealth (Lucas, 1988). The process of accumulation of intangible capital is crucial for the development of the productivity of an economy, and thus for the expansion of national economies (Romer, 1997).

Moreover, the valuation of intangible assets is included in all economic models. To some extent, the stock of intangible wealth can be used to account for economic expansion. This is due to the accumulation of four forms of capital: financial, human, physical and public (Khalid, Hamdi, 2022).

Based on this theoretical framework, it is clear that spending money on intangible assets generates new wealth and stimulates the economy. Since the transition from a material to an immaterial economy explains the change in the driving forces of the economy, we can identify the characteristics of intangible capital, which we list below (Haskel & Westlake, 2017).

When it comes to intangible investment, the indicator characteristic is overwhelmingly positive, meaning that doing so generates net positive effects for society as a whole. Those who did not contribute directly to the creation of the intangible asset can still reap the benefits. Unlike those who did not make intangible investments, those who did will benefit from this risk differential. Intangible investments, such as imports and exports, can have a positive impact on the direction of economic growth at the macro level:

- Process and end result indicators generate synergy effects, in general, this type of wealth combines and merges perfectly through its components; the interaction between the
components of intangible capital is what creates value, and this is what is meant by synergy effect. Economic decision-makers must sort through the available data to find the most important indicators of intangible capital, and then combine them. With the chosen interactions, economic growth can be maximized to its full potential.
- The third characteristic is that the intangible indicator plays a moderating role with the indicators for improving economic growth, it can be used at a larger scale of production.
- The economic agent can allocate the same intangible wealth in several productive processes without its stock depreciating. This characteristic allows an economy to participate in several markets with the same intangible capital.

In summarize, macroeconomic indicators in the education and health sectors can play an important role in improving economic growth by contributing to increased productivity and reduced health costs. Investments in these sectors can also stimulate domestic demand and improve the quality of life of citizens, which can boost investor confidence in the economy and improve the country's image on the international stage.

However, effective implementation of appropriate policies is crucial to achieving these goals, as well as to addressing the institutional and structural challenges that can hinder the development of the health and education sectors, particularly in developing countries.

Conclusion

In conclusion, we have linked the development of the Moroccan economy to the increase of its intangible capital. Our results corroborate previous theoretical work that documents the importance of intangible capital in the history of economic expansion. According to our results, most economic (structural) indicators increase along with economic growth indicators, demonstrating a strong association between the two.

Future researchers are encouraged to conduct econometric studies on the measurable basis of the five modern variables that influence economic growth (BAM & CESE, 2016). This will allow for a more accurate examination of the multidimensional impact of the indicators on economic growth. The knowledge indicator, HDI rate, unemployment rate, adjusted net savings, and inequality are some of the indicators identified by Benson, M. A. (2021).

Education and health are crucial inputs for economic growth- they enhance the productivity and efficiency of individuals and promote development. Macroeconomic indicators such as enrolment rates and literacy rates measure the level of education while mortality rates and access to quality healthcare determine the level of health.
Investments in education and health promote economic growth by increasing human capital, promoting productivity and enhancing the population's overall well-being. Governments need to recognize the importance of these two indicators and make the necessary investments to sustain long-term economic growth.
Bibliography

André, J. M. (2019). Is health care spending sustainable (No. hal-02393091).


BOUYACOUB, B., & MEBARKI, N. The determinants of economic growth in Algeria during the period 2000-2015: an empirical analysis.


