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How important are human resources in economic growth?

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Abstract: Researchers have widely debated the relationship between human resources and economic growth. There is considerable quantitative evidence of the importance of human resources in the competitiveness of organizations however, despite the qualitative evidence of the importance of human resources in countries' economic growth, there is little quantitative evidence. Issues related to the ethics workforce have been somehow underestimated in their relationship to national income and economic growth. This article presents such quantitative evidence. The quality of human resources in three distinct areas, namely personal ethics, work ethics and instruction, are related to national income, proving to be an important source of countries' economic growth. The importance of ethics in firms is unquestionable and, despite being an individual characteristic of the workforce, it is reflected in collective behavior which, in turn, translates directly into trust, efficiency, and productivity. This research paper presents a cross-section of 33 countries over a five-year period that establishes solid empirical evidence of the importance of these specific characteristics of human resources for countries' national income and growth.

Keywords: *Development, Economic growth, Ethics, Human resources, Instruction.*

1. Introduction

The quality of human resources is fundamental to any country's economic growth. It is well known that the most developed countries have highly competent human resources. The concept of human resources used in this research is a broad one, which encompasses the quantity and quality of individuals willing to work in an economy. It's therefore a notion that goes far beyond the microeconomic approach of considering human resources as a set of practices related to the workforce within an organization (such as recruitment and selection, training and development, performance management, benefits and remuneration, career planning, etc.). In this research we consider a macroeconomic perspective, in which we will use the term human resources as a synonym for the notion of human capital. Although these concepts do not formally coincide, they overlap in many respects and are so closely related that we can't discuss one without mentioning the other.

At the center of economic growth are human resources, which are the essence of productivity, innovation and the competitiveness of economies. Innovations include technology but also business practices and human resource management. The importance of human resources can be outlined in three areas as follows:

Innovation and competitiveness: skilled professionals are instrumental in producing cutting-edge technologies, new processes, and ideas that make organizations run more efficiently and give companies a competitive edge (Agit et al., 2024; Jotabá et al.,2022) [1][2]. Countries with a solid education and training system are more likely to achieve economic breakthroughs.

Higher productivity: a trained, prepared and motivated workforce raises firms' achievement and the performance of a country´s various productive sectors. Workers' productivity is directly

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linked to increases in GDP which can lead to cycles of economic growth and development. Numerous empirical studies demonstrate the impact of the quality of human resources, measured by various metrics, on the productivity of organizations and countries (Bahirot et al., 2024; Rony et al., 2024; IMAD, 2022, OCDE, 2023) [3] [4] [5] [6].

Economic resilience: in a rapidly unfolding global context of profound change — digitalization, automation — a workforce that can engage in lifelong learning assures that countries can be resilient to multiple economic and technological shocks. Hence, human resources are value, innovation, and development generators (OCDE, 2021; Newman et al., 2023) [7] [8]. Any government and firm that focuses on human development policies will have a more robust and dynamic economy.

The importance of human resources has been extensively explored at the organizational level. Numerous research studies have analyzed their relevance to firms, both quantitatively and qualitatively (Marthalia, 2022; Alami and Fattahi, 2018, Ammirato et al.,2023; Nugroho, 2022; Saridakis, Lai and Cooper, 2017) [9] [10] [11] [12] [13].

Regarding the relevance of human resources as a source of economic growth, research has mainly been based on the analysis of human capital, understood as the set of skills, experiences, and competencies that employees contribute to the company. Human capital is intangible and fundamental to innovation, productivity, and competitive advantage. It can be expressed as the know-how, skills, abilities, and technical specializations of the workforce (Osiobe, 2019; Tran and Thai, 2023). [14] [15]

Our objective is to evaluate the impact of specific human resource variables, namely personal ethics, work ethics, and training/instruction, on the growth of gross national income. To do this, a linear regression was carried out, with income as the dependent variable and specific human resources variables as independent variables.

2. The Evolution of Human Capital Theories

Given the degree of convergence between the concepts of human resources and human capital, it's worth taking a look at the evolution of the concept of human capital in economic thinking (Mayilyan and Yedigaryan, 2022; Fix, 2021; Škare and Lacmanović, 2015) [16] [17] [18].

Human resources and their role in stimulating economic growth have evolved in line with changes in economic theories and organizational practices. The concept of human capital emerged in the 20th century (1960s) through the Human Capital Theory. The main authors were Gary Becker (Nobel Prize for Economics) and Theodore Schultz. The logic behind human capital theory is that education and training are investments in human capital which, in turn, will result in increased productivity and economic growth. Education has a strong relationship with skills and competencies that make us work better. Trained workers will be productive and resilient, and health will thrive. The 1980s saw the emergence of the Theories of Endogenous Growth by Paul Romer and Robert Lucas. These authors advocate that economic growth is generated within a system as a direct result of internal processes (endogenous factors). They defend the idea that economic growth does not depend on uncontrollable external forces (exogenous factors) but on internal investments in human capital development that will lead to new forms of technology and more efficient methods of production. Education and knowledge now become the key factor in generating technological advancements that would ultimately drive economic growth. The idea of knowledge spillovers explains why investments in people benefit society as a whole. Globalization and the emergence of the Knowledge Economy since the late 20th and early 21st centuries have made human capital a competing factor between nations and firms. Workers are now valued above all for their ability to innovate, solve problems and technological and digital skills. Countries invest in basic and higher education and technical training to attract foreign investment and develop strategic sectors. Indexes such as the PISA, and the Global Talent Competitiveness Index reveal how these skills directly affect economic growth. The latest theories, for example, Economy 4.0 and Digital Human Capital, propose that with the revolution of technology, human capital also evolved and new

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skills, such as digital literacy, were included in the concept of human capital, as well as innovation in information technology and adaptability to new forms of work, such as remote work and gig economy (Eger and Žižka, 2024; World Bank, 2018) [19] [20]. The countries and companies that get ahead in investing in digital training and retraining of workers (reskilling and upskilling) will gain a competitive advantage. The evolution of economic theories on human resources emphasizes a paradigm shift — from cheaply motivated producers to strategically networked assets crucial for sustainable economic growth. Today, no one can dispute that human capital is one of the key drivers of innovation, competitiveness, and global prosperity (Erhlich and Pei, 2020) [21].

3. Methodology

A linear regression was carried out with gross national income as the dependent variable. Three variables specific to human resources were included as independent variables, namely work ethic, personal ethic and training or instruction. The purpose of choosing the independent variables is to understand the impact of these specific aspects of human resources on countries' economic growth, since they measure the quality of the workforce and, consequently, their performance in firms and in the economy in general. The methodology used is innovative in the sense that it uses variables that are not normally used to assess economic growth. Although numerous variables can be pointed to as sources of growth, the question of ethics has not yet been sufficiently explored in growth issues. The quality of instruction, on the other hand, is a more common variable in the relationship with growth. However, its relationship with aspects concerning the ethics of the workforce is not very common. The management of human resources in a microeconomic perspective includes several areas from hiring to training, to motivation, to career planning. At the organization level, there is considerable evidence that in hiring two key success factors have been forwarded: personal ethics, as character, and work ethics as attitude. The absence of these has been demonstrated to be destructive to organizations, as it leads to dissent, demotivation, people "retiring on the job", passive resistance and the more qualified leaving (Seijts et al, 2015[22]; BIAC, 2015 [23]).

On the contrary, the presence of work ethics has been forwarded as paramount (Sapada et al, 2017) [24] leading to initiative and resourcefulness, acceptance of risks, solution orientation (problem-solving), responsibility, open-mindedness, perseverance, teamwork, and discipline. On top of both types of ethics (personal and work-related), training or instruction has also been singled out as a source of competitive advantage (Divya and Gomathi, 2015) [25].

To evaluate these three human resources variables at the country level, several indexes of non-governmental organizations were used. For personal ethics, the corruption perception index of the NGO Transparency International [26] was used. There is a strong relationship between a lack of ethics and the practice of corruptive activities at the organizational level. Corruption is therefore a good proxy for a lack of personal ethics. For work ethics, the global innovation index was used. The index results from a joint venture between Cornell and Insead universities and the NGO World Intellectual Property Organization and rates countries in items such as networking and linkage, openness to absorbing knowledge, capacity to diffuse knowledge and the impact of creativity [27]. For the level of training, education was used as a proxy. Training, understood in this context as the totality of instruction received by the workforce was evaluated by the quality and enrollment level of primary and higher education together with professional training measured by the NGO World Economic Forum in the pillars 5 plus 4.09 and 4.10 of the competitiveness index [28]. It is therefore a measure of education that goes beyond formal education and also encompasses more practical skills acquired in a professional context.

Table 1 summarizes the above information.

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Table 1.
Variables and Indicators.

Variables	Indicator	Source
Personal ethics	Corruption perception index	Transparency international
Work ethics	Global entrepreneurship index	Global entrepreneurship and development institute
Training/Instruction	Instruction quality	World economic forum

Data on the dependent variable of national income per capita at purchasing power parities was extracted directly from the World Bank.

The sample selection followed several criteria. First, data is both cross-section and time series. The sample includes developed countries (OECD members) as well as less developed ones. Our sample has the 35 countries used in a study by Bloom et al. [29] which evaluates the quality of general management for several countries (Table 2). The period of years chosen is meaningful. A time frame between the subprime crisis and the COVID crisis was chosen to avoid major shocks, resulting in a total of 165 observations (33x5) spanning 5 years.

Table 2 shows an exhaustive list of all 33 countries included in the research.

Table 2.
Country selection.

OECD members	Non-OECD members
Australia	Argentina
Canada	Brazil
Chile	China
Colombia	Ethiopia
France	Ghana
Germany	India
Greece	Kenya
Ireland	Mozambique
Italy	Nicaragua
Japan	Nigeria
Mexico	Singapore
New Zealand	Tanzania
Poland	Vietnam
Portugal	Zambia
Spain	
Sweden	
Turkey	
United Kingdom	
United States	

3.1. Personal Ethics

A nation's economic behavior is closely linked to standards of personal ethics. Although it is an individual characteristic, it is reflected in collective behavior which, in turn, directly affects the efficiency, fairness, and sustainability of economic activities. Personal ethics is an element that develops trust between individuals, firms and institutions. In turn, trust reduces transaction costs, reduces the need for excessive regulations, and produces a more stable environment for investment (Rozin and Park, 2022) [30]. Ethical personal conduct tackles corruption and nepotism, which are major drains on public resources and inhibit economic growth. The incentive to achieve meritocracy, innovation and fair competition, indispensable for sustainable economic development, is greater in a country dominated by ethical values. Ethical individuals are likely to be more dedicated, responsible and productive. It's when everyone, from the bottom up to the corporate tycoons, takes responsibility that organizations

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can function better, leading to greater productivity and, consequently, economic growth. Business investment is higher in countries with high standards of ethics and integrity. An ethical culture establishes a level of predictability and transparency that effectively reduces the perception of risk and increases attractiveness for international capital, a key driver of economic growth (Vorster and Vuure, 2022) [31]. Ultimately, personal ethics is the way to build a strong and sustainable economy. It guarantees trust, promotes efficiency, and reduces the corrupt and dishonest practices that inhibit progress. The continuity of public and private institutions is cemented by personal ethics. A body of ethical individuals in governments, firms, and organizations does a better job of developing and implementing policies that stimulate economic growth.

3.2. Work Ethic

Work ethic is fundamental to maximizing productivity and efficiency in every interaction with the market and, consequently, with the country's overall economy. An ethic based on values such as integrity, discipline, responsibility and dedication, and which is reflected in all sectors of life, will potentially have a huge impact on the economy. A good work ethic boosts productivity because it encourages workers to adopt a higher level of commitment, which leads to greater productivity, both on an individual and group level. Incorporating ethics and discipline, among other variables, into the effectiveness of organizations and financial sectors, becomes an advantage for global economic development (Abed, 2016) [32]. A strong work ethic also contributes to the accumulation of human capital. When qualifications and continuous training are more encouraged, it is possible to raise the skill level of the workforce. In addition, a culture based on the work ethic also encourages innovation, which is fundamental to economic advancement in the 21st century. When you work in a work ethic culture that gives you independence and makes you accountable, that in itself gives you much more incentive to instigate creative thinking and find creative solutions (Passos, 2017) [33]. Firms with a strong work ethic also tend to invest more in R&D, which is an important driver of technological and economic growth. Work ethics also contribute to a stable and predictable business environment, which can make the investment more attractive. (Albu et al, 2017) [34]. Such economic growth can be unstable without a strong work ethic.

3.3. Training/Instruction

Training is one of the pillars for improving a country's economic growth, building up the workforce, increasing productivity, capacity and competitiveness, and the ability to innovate. It is recommended that firms involve workers, since training is a process of acquiring the skills necessary for a worker to perform his or her task, during which the employer provides practical knowledge, as well as the application of this knowledge, to work, increase productivity and achieve the firm's objectives. Better-trained workers produce more productive workers. Training equips workers with new specific skills, ensuring they always work at peak performance. In addition, trained professionals perform their work with greater precision, which uses existing resources and minimizes costs (Kozhakhmet et al, 2022) [35]. Training and instruction also promote innovation. Training technical workers, through training in technological and scientific fields, stimulates innovation, which is key to economic growth (Sung and Choi, 2018) [36]. This also means that a trained and instructed workforce can easily adapt to new methods, technologies, and market opportunities. It allows workers to compete in demanding markets, encourages experimentation and attracts investment. Countries that invest in instruction are better placed to achieve lasting growth and develop an economy that is both resilient and aligned with global transitions. The quality of education has also been proven to boost countries' economic growth, especially as it is one of the main factors contributing to the accumulation of knowledge which, in turn, forms the basis of a more innovative and productive workforce (Goczek, Witkowska and Witkowski, 2021) [37]. Empirical data indicates that a positive change in the quality of education can have a major impact on a country's overall growth rates.

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For instance, the relationship between years of schooling and economic growth is strengthened when education is high quality and aligned with labor market demand. Investing in the quality of education is also a sound economic investment. Countries that focus on improving education will have a much more qualified workforce, which will lead to greater global competitiveness and sustainable economic growth.

4. Results and Discussion

Prior to the regression analysis, a T-test was carried out to assess the relevance of each variable relating to human resources within the framework of the defined model. According to the data, all the variables were significant, but with different parameters. Work ethics had the greatest impact on the dependent variable, followed by training and personal ethics. The three human resources variables were introduced in the regression analysis in a piecemeal way, starting with the one with the greatest impact on income per capita which was work ethics producing an R^2 of 79%. By adding successively training and personal ethics, the R^2 improved to 83% and 84% respectively. All R^2 are significant at zero level as are the variables parameters of 642 (work ethics), 526 (training), and 251 (personal ethics) in Table 3.

Table 3.
The regression results: Parameters, T-test and significance.

Dependent variable	**Gross national income per capita at purchasing power parities (*pp*)**	**Model**	**R^2=0.8439**	
			F test	**Value=236.53**
				Significance = 0.0000
Independent variables	Indicator	Parameter	T-test	Significance level
Work ethics	Global entrepreneurship index	641.69	4.21	0.000
Training/Instruction	Instruction quality	526.06	5.62	0.000
Personal ethics	Corruption perception index	250.56	2.98	0.003

To reinforce causality, the independent variables preceded national income per capita obtained from the World Bank by one year, with the former referring to the years 2014-2018 and the income corresponding to 2015-2019. To avoid heteroscedasticity a robust regression was performed. The normal distribution of the residuals is not an issue since the goal is to minimize the mean squared errors and due to the large sample size of 165 observations, and neither is the residual autocorrelation as the sample is more cross-section (33 countries) than time series (5 years).
Furthermore, that was visually confirmed by Figures 1 and 2.

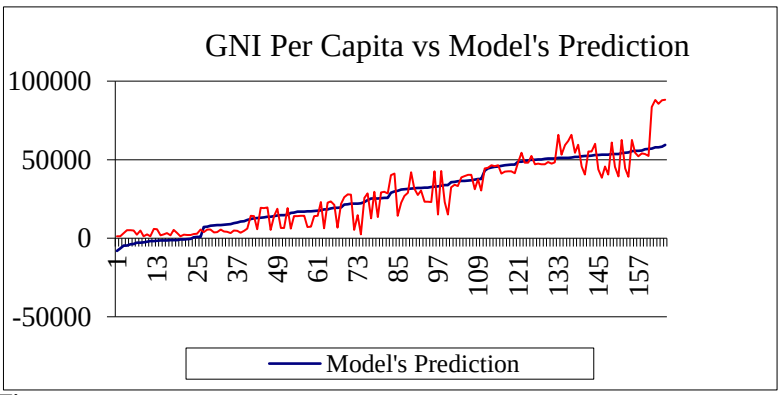

Figure 1.
Linearity of the model.

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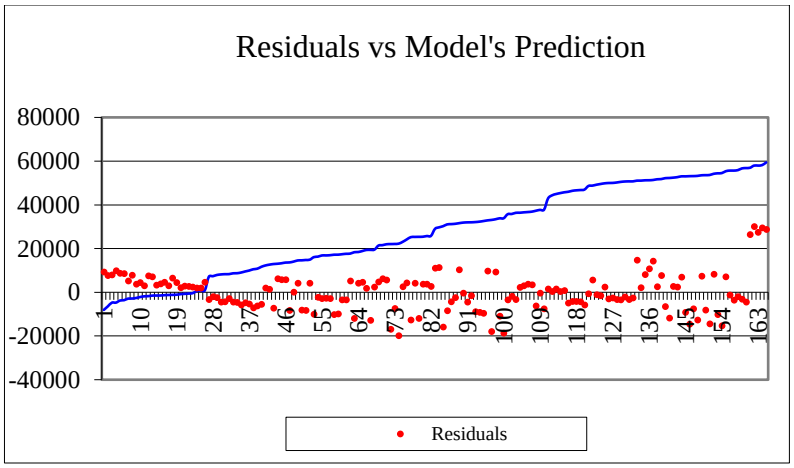

Figure 2.

The horizontal axis is compounded by the 165 observations (from 33 countries within 5 years) ordered by the model´s prediction. So, observation 1 stands for a specific country in a specific year which the model predicts as having the lower level of GNI Per Capita; while the 165th stands for the highest. The vertical axis is ordered in US Dollars.

Given that, in Figure 1, the model´s prediction crosses in the middle of the real values and that, in Figure 2, the residuals seem stationary as the prediction values increase, it seems that the linear form is the most adequate.

Finally, the model does not suffer from multicollinearity as it passes three tests: the R^2 of any independent variable on the others is always smaller than the R^2 of income per capita on the independent variables. The R^2 of training/instruction is the highest (0,843) but still inferior to that of income (0,844); all t statistical tests assume values greater than two; and the VIF test $[1/(1-R^2)]$ of training, personal ethics, and work ethics assume the values of 5,9; 5,1 and 6,4, all below the threshold value of ten.

5. Conclusions

This research provided strong empirical evidence that three human resources characteristics such as training, work ethics personal ethics, are highly important in explaining the variance among countries' income per capita.

A regression analysis which passes all standard tests was performed on a sample of 33 countries during a five-year period and the quantitative analysis demonstrated this relevance.

Less explored variables in economic growth, such as personal ethics and work ethics, have demonstrated their contribution. Although ethics is an individual characteristic, it is reflected in the collective behavior of organizations and ends up having repercussions on a country's efficiency, productivity, and performance. An approach to issues of ethics is inevitable in economics. So, empirical evidence suggests that ethics, along with the quality of hiring and training are paramount, not only to organizations but also to the country's economic development.

It would be interesting to see future research introduce other human resources variables, such as the quality of staffing, the diffusion of career planning and motivation techniques, among others, as well as developing contingency theories based on factors such as geography and country sizes. All these variables also play an important role in a country's prosperity.

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