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Human Capital and Economic Growth in North African Countries: The Role of Institutional Quality

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Abstract: This paper aims to study the association between institutional quality, human capital, and economic growth in 4 North African countries, namely, Tunisia, Morocco, Algeria, and Egypt. Annual panel over the 2000-2021 period are examined using the System GMM. The result show that institutional quality and human capital can fuel economic growth. Interestingly, institutional quality and human capital have a significant positive interactive impact on the economic growth of North African countries. Policy implications of these results are that careful attention should be paid to co-development policies to improve the institutional quality and the human capital in these countries. Policies should also deliberate economic growth policies to maintain sustainable economic growth.

Keywords: Institutional quality, human capital, economic growth.

1. Introduction

In contemporary theories of growth, the development of human capital and the quality of institutions are identified as important factors of economic growth. Furthermore, the existence of good quality institutions is an important precondition for human capital to contribute significantly to economic growth, as human and social capital exert a direct positive effect on productivity. Furthermore, the role of institutional quality in the link between human development and growth is still unresolved, as China has experienced special economic growth without having high-quality political and economic institutions, the so-called "China Paradox".

Consequently, this study explores the effect of institutional quality and human capital on economic growth in the North African countries. Unfortunately, empirical analysis on the impact of the interaction of institutional quality and human capital on GDP growth of these countries are very limited. Also, we examine the related growth effects of institutions and human capital. In fact, we study whether institutional quality can be a positive moderator for the effects of human capital on economic growth in the region. According to Tang and Zhang (2016), human capital stands for the absorptive capacity of host countries, as in the spirit of the endogenous growth theories. Moreover, in the context of the Millennium Declaration era, the World Bank has been carrying out human capital projects in Africa to help the African countries to develop their human capital. The World Bank (2018) recognized that human capital development plays a key role in ending extreme poverty and strengthening social inclusion. This requires investment in nutrition, health services, quality education, skills acquisition and access to jobs.

This paper then contributes to the related literature in three main aspects. First, to the best of the authors' knowledge, this is the first study to examine the moderating role of economic freedom, an indicator of the quality of economic institutions, in the human capital-economic growth nexus in North African countries. Second, the findings of this paper have important policy implications for the North African countries as human capital and institutional quality are two of the most important determinants of economic growth. To achieve this, it is necessary not only to improve the quality of institutions, but also to increase the level of human capital. Third, compared to previous studies, this paper uses a more advanced dynamic panel econometric technique that formally addresses the countries' specific effects and simultaneity bias. This method is based on the generalized method of moments (GMM) estimator, which has a number of advantages over the cross-section estimator.

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This paper studies the role of institutional quality on human development–growth nexus in the north African countries. We aim to address the following this research question: Do institutional quality (economic freedom) matter in the human development-growth nexus?

The remainder of this paper is structured as follows: Section 2 provide an overview of the background literature. Section 3 describes the data and the empirical methodology. The empirical results are offered in section 4 and finally section 5 presents the conclusions comments on policy implications.

2. Literature review

2.1. Theoretical literature

In the literature on long-term growth, there is broad consensus that the accumulation of human capital and knowledge plays a crucial role in the process of economic development. Empirical evidence on the subject has shown, moreover, that one of the explanatory causes of growth gaps between countries lies in differences in terms of quantitative and qualitative endowments of human capital.

Human capital is an intangible asset that can advance skills development for worker employability and business productivity. It can grow, shrink or become useless. It is subject to different effects and comes from different origins, including, but not only, learning organized in the form of education and training. The four elements (knowledge, qualifications, skills and other personal qualities) can be united in different ways depending on the individual and the context in which they are used (Al-Tit et al. 2022).

Economists consistently confirm that human capital is a determining factor in economic growth, regardless of the state of economic situations (see Solow, 1956; Nelson and Phelps, 1966). With the appearance of new growth theories discussed by Lucas (1988), Romer (1986) and Barro (1997), human capital development has become one of the important factors for strengthening economic growth through technological advances by decreasing inequality and achieving productivity gains (Čadil et al. 2014). On the other hand, labour productivity mainly depends on the new skills and knowledge developed by the education system, which can transform the population into labour as a productive input into the production function (Barro, 1991). Additionally, employing a skilled workforce appears to be crucial to achieving high business productivity. Human capital consequently constitutes a potentially crucial determinant in enhancing economic growth.

As for Romele (2013), he showed that the development of human capital requires continuous and substantial investment in capacity building through the application of government skills development programs and improving the education level of workforce. In fact, the development of human capital positively effects the development of physical capital in the economy. Investments in human capital can also reduce income inequality in society (Heckman and Jacobs, 2010) and ensure higher labor force size and promote inclusive and sustainable economic growth (Deere and Vešovice, 2006). For his part, Lucas (1988) emphasized the essential role of human capital in economic development for developing countries.

2.2. Empirical literature

In fact, many empirical studies have shown the positive effect of human capital on economic growth. For example, Qadri and Waheed (2013) showed evidence of a positive human capital contribution in overall and sectoral production and economic growth in a cross-section of 106 countries. however, its magnitude is similar in the agricultural and industrial sectors, greater than that associated with the services sector. As for Jaiyeoba (2015), he found a positive link between human capital and economic growth in Nigeria. For his part, Pelinescu (2015) reported a positive impact of human on economic growth in European Union countries.

Likewise, Teixeira and Queiros (2016) showed a link between the development of human capital and economic growth in the countries of the Organization for Economic Co-operation and Development, countries in transition and Mediterranean countries. As for Fang and Chang (2016), they pointed out a positive link between human capital and long-term economic growth in 16 countries in the Asia-Pacific region. For their part, Ogundari and Awokuse (2018) examined 35 sub-Saharan African (SSA) countries and found that human capital has positive effects on economic growth, although the contribution of health is relatively larger than the impact of education. For their part, Han and Lee (2020) found that human capital contributes significantly to economic growth in Korea; it accounted for 0.5% points of economic growth over the period. They recommended that polices to improve human capital of female or elderly workers help to increase human capital growth.

As for Ogbeifun and Shobande (2022), they showed that human capital plays a vital role in economic growth for a panel of 24 OECD countries. For their part, Ali et al. (2022) pointed out that human capital has a positive and significant link with economic growth for higher-income and overall Organization of Islamic Cooperation countries (OIC). However, in lower-income OIC countries, human capital has an insignificant correlation with economic growth. More recently, Shaban and Shahbaz (2023) found that India's cultural diversity and human capital have significant effects on regional economic growth in India.

The relationship between institutions and economic growth has been the subject of much research and debate among economists. One of the most influential studies on this topic is the work of North et al. (2009) who claimed that the key to economic development is the development of inclusive institutions that limit state power and protect property, rights of individuals and businesses. They argued that inclusive institutions, such as the rule of law, constitutional limits on state power, and an independent judiciary, are necessary for economic growth because they create a stable and predictable environment in which individuals and businesses can make long-term investments. Another important contribution to this literature is the work of Acemoglu and Robinson (2012), who showed that the key to economic growth is the development of institutions that promote economic and political competition. They pointed out that institutions that provide opportunities for individuals and businesses to compete for resources and power are more likely to generate economic growth than those that concentrate power in the hands of a few people. They also maintained that institutions that promote economic and political competition are more likely to be inclusive and protect the property rights of individuals and businesses.

The definition of institutions assumed by North (1990) is the most used in institutional economics. According to North (1990), institutions are the rules of the game in a society, or more formally, they are the humanly designed constraints that determine human interactions. Consequently, institution's structure incentives in human exchanges, both in the political, economic and social domains. Furthermore, institutions have the nature of reducing uncertainty in everyday life (North, 1990). Acemoglu et al. (2005) defined institutions as a combination of three closely related concepts:

- Economic institutions: These include the factors that govern the incentive structure in society and the distribution of resources. For example, the structure of property rights, barriers to entry, all contract types.

- Political power: Economic institutions are themselves the result of collective choices by society. A society is made up of different groups with conflicting interests. The distribution of political power determines the quality of economic institutions.

- Political institutions: They are legal instruments enabling the functioning of public authorities and the State. The first of these instruments, which guarantees the national sovereignty of a country, is the constitution.

Several economists show that the quality of institutions plays a vital role in the economic performance of countries. Interested in the role of institutions in the process of economic growth, Knack and Keefer (1997) affirmed the existence of a positive relationship between the different indicators of institutional quality (political stability, bureaucracy, property rights) and economic performance. Hall and Jones (1999), argued that differences between countries in institutional development and policies adopted by governments could be a fundamental determinant of differences in productivity and capital accumulation. Furthermore, Raiser (1997) revealed forward the idea that the weakness of economic performance in the countries of the former USSR could be explicated by the poor quality of institutions through their influence on social capital.

The literature also showed several benefits of institutional quality. For example, good institutions can have an effect on improving education, reducing inequality and reducing public consumption, which could increase economic growth (Tavares and Wacziarg, 2001). Institutional quality increases the level of economic growth, particularly through their impact on investments (Busse and Hefeker, 2007). Reuveny and Li (2003) supposed that the quality of institutions plays a role in reducing income inequalities. As for Mauro (1995) and Shleifer and Vishny (1993), they emphasized the negative interaction that exists among the level of corruption and economic growth, and showed that the structure of institutions and the political process determine the level of corruption which is detrimental to economic growth.

Other economists have used history to demonstrate the impact of the quality of institutions on the current state of different economies. Engerman and Sokoloff (2002) confirmed that the former European colonial powers adopted different strategies of colonial exploitation which led to different institutional trajectories in these countries, with a more developed (Canada and United States) than the South. Acemoglu and Robinson (2008) showed that previous institutions have a long-term effect on economic performance. They also argued that the colonial origin is strongly correlated with the current economic situation through its impact on the quality of current institutions.

On the other hand, Rodrick et al. (2004) showed that institutional quality plays an important role in explaining income gaps between rich and poor countries. In the same line of thinking, Acemoglu and Robinson (2012) explained that the difference in income and living standards between rich and poor countries is based on the existence of "inclusive" political and economic institutions which, according to them, represent the key to the prosperity of nations by creating a virtuous circle of innovation and economic expansion. For their part, Méon and Sekkat (2004) indicated that improving institutional quality in MENA countries will lead to an increase in entry of foreign direct investment and exports of manufactured products and will also allow the participation of these countries in the world economy.

As for Ouedraogo et al. (2021), they analyzed economic development in Africa through the examination of the role of institutional quality in the development of human capital using a panel of 49 African countries over the 1996-2018 period. They showed that improving institutional quality encourages access to primary, secondary and higher education in general and for women. In particular, controlling corruption, government effectiveness, political stability are the main determinants that promote the development of human capital. Their results suggested that promoting these particular dimensions of institutional quality is crucial to improve human capital development in Africa.

For their part, Uddin et al. (2021) studied the effect of institutions, human capital and economic growth in a panel of 120 developing countries over the 1996-2014 period. They showed that the development of human capital and institutions have positive effects on economic growth. Remarkably, institutional quality and human capital development have a significant negative interactive impact on GDP growth in developing countries. They concluded that additional investment in human capital development would have a negative effect on economic growth in the presence of weak or dysfunctional institutions, because the additional stock tends to be diverted into socially unproductive activities. They also confirmed that the prosperity of a country presupposes the existence of solid institutions, a necessary condition to create an environment to facilitate the development of the private sector, reduce poverty and provide useful services to the population.

On the other hand, Uberti and Knutsen (2021) used panel data over the 1955-2010 period and an indicator reflecting the protection of property rights (indicator of institutional quality) to study the link between institutions, human capital and economic growth. They pointed out that property rights protection and human capital are positively associated with economic growth because it encourages investment and innovation. In countries where property rights are not clearly defined and protected, individuals and businesses are less likely to invest in long-term projects or make large purchases because they cannot be sure that their investment will be safe. This can lead to a lack of economic development and slow economic growth.

As for Abdulwahab (2023), he examined the effect of institutional quality and human capital development on economic growth for the SSA countries over the 2002-2021 period. He argued that institutional quality and human capital development have a statistically low impact on economic growth in these countries. He also recommended that various authorities should improve the quality of health care and make the education system more efficient and allocate adequate resources to productive sectors to promote economic growth.

More recently, Doré and Teixeira (2023) studied the extent to which human capital and institutional quality contribute to economic growth in Brazil, over the 1822-2019 period. They suggested that human capital (measured by years of schooling) have a positive impact on economic growth in Brazil. They also revealed that institutional quality does not have a decisive effect on economic growth in Brazil.

Taken as a whole, the effect of institutional quality and human capital on GDP growth are exposed in the literature to be mixed, whereas their influence on the North African countries is attracting increasing attention between economists and analysts. In fact, this paper is interested by similar reflexions and efforts to identify the potential complementarities among institutions and human capital in the North African countries over the 2000-2021 period.

3. Data and Empirical methodology

3.1. Data

In fact, this article studies 4 North African countries to know: Tunisia, Morocco, Algeria and Egypt over the 2000-2021 period. The countries are selected for this study is mainly inspired by the availability of reliable data during the sampling period. The dependent variable is economic growth measured by the growth rate of real GDP per capita at prices in 2015 US dollars. The key variable of interest (human capital) and other control variables (initial GDP, inflation rate, government size) are attained from the World Development Indicators database (World Bank, 2024).

At the macroeconomic level, human capital thus appears to be a factor of growth. Mankiw et al. (1992) found that differences in human capital between countries help explain a large part of

their differences in terms of economic growth. In the literature, human capital is measured by school enrollment rates. Some studies use the gross enrollment rate in secondary education while others use the gross enrollment rate in primary education (see Qaisar, 2001 and Nyamongo et al. 2012). In both cases, these approximations generated positive coefficients in support of the theory. In this study, we use the school enrolment, tertiary (% gross), because data are relatively available. Higher education rates lead to greater human capital, which should be positively associated to economic growth (Gemmel 1996). This variable should have a positive impact on economic growth.

Additionally, the extended model will contain the following institutional variable: The index of economic freedom. Economic freedom is measured in five different categories: (1) the size of government; (2) the legal structure and security of property rights; (3) access to sound money; (4) freedom of international trade and (5) regulation of credit, labour and commercial activities. The overall domain scores are all on a scale of zero to 10, with zero being the least free and 10 being the freest. In fact, the greater the economic freedom, the more it strengthens economic growth (Doucouliagos and Ulubasoglu, 2006). We therefore expect a positive coefficient. Besides, data are obtained from Gwartney et al. (2023).

Our baseline regression model contains the explanatory variables common to most empirical growth literature:

• Initial GDP per capita was comprised in the model to capture conditional convergence in the spirit of the neoclassical theory of economic growth (Barro and Sala-i-Martin, 1995). Numerous studies have showed that GDP per capita can be a good indicator of general development and the sophistication of institutions (La Porta et al. 1998). A negative coefficient is expected, representing the existence of conditional convergence between North African countries;

• Inflation rate is defined as the growth rate of the consumer price index (CPI) to measure the effect of price instability on economic growth. High inflation can contribute to deteriorating price competitiveness leading to negative impacts of the external sector on economic growth (Aydin et al. 2016).

• Government size is measured in terms of government spending as a percentage of GDP. In the literature, there is no consensus on the direction of the relationship between public spending and economic growth. Indeed, empirical work shows that public spending can affect economic growth negatively or positively depending on the nature and quality of public spending (Devarajan et al. 1996; Gupta et al. 2005).

3.2. Empirical methodology

The objective of our empirical analysis is to study how institutional quality affects human capital and GDP growth in the North African region. To this end, we employ a specification similar to that of Uddin et al. (2021) by considering the next model:

$$Growth_{i,t} = (\alpha - 1)\, y_{i,t-1} + \beta_1 HK_{i,t} + \beta_2 IEF_{i,t} + \beta_3 (IEF_{i,t}.HK_{i,t}) + \beta_4 X_{i,t} + \mu_t + \eta_i + \varepsilon_{i,t} \quad (1)$$

The subscript "t" represents the periods, whereas i represents the country, Growth is the real GDP growth rate per capita, IEF represents proxy for institutional development, HK represents proxy for human capital and X is the matrix of the control variables, μ_t is a time specific effect, η_i is an unobserved country-specific fixed effect and $\varepsilon_{i,t}$ is the error term. Eq. (1) forms the basis for our estimation. ($\alpha - 1$) is the convergence coefficient.

The hypothesis that we wish to verify in this study is that the quality of the host country's institutions affects the development of human capital and therefore economic growth. To this end, we add an interaction term created as the product of IEF and HK (i.e. IEF*HK), used as an additional explanatory variable in equation (1).

The role of institutional quality in affecting human capital and hence, economic growth is assessed using the coefficient β_3. In fact, if β_3 is positive and statistically significant, a high institutional quality could enhance the marginal effect of human capital on economic growth. This suggests that there is a complementarity between institutional quality and human capital. On the other hand, if β_3 is negative and statistically significant, a bad quality institutions could reduce the marginal effect of human capital on economic growth. In other words, a negative interaction offers evidence of substitutability between institutional quality and human capital.

In order to estimate equation (1), we use the GMM on a dynamic panel (Arellano and Bond, 1991; Blundell and Bond (1998). The GMM method has, among other things, the advantage of controlling endogeneity between variables. The instrumentation method differs depending on the nature of the explanatory variables: (a) for purely exogenous variables, current variables are used as instruments; (b) for weakly exogenous variables, values lagged by at least one period are used as instruments; (c) for endogenous variables, values lagged by two or more periods can be used as valid instruments.

The GMM estimator proposed by Arellano and Bond (1991) is based on the orthogonal conditions between the lagged endogenous variable and the error term. It helps provide solutions to the problems of simultaneity bias, reverse causality and omitted variables. It also makes it possible to correct the endogeneity of all the explanatory variables of the model. This estimator refers to the first difference GMM method in order to reject specific individual effects and the use of lagged values of the dependent variable as instruments.

Further on, Blundell and Bond (1998) propose the system GMM estimator. They combine first difference equations with level equations in which variables are instrumented by their first differences. Through Monte Carlo simulations, Blundell and Bond (1998) proved that the System GMM estimator performs better than the first difference one. Certainly, when the instruments are weak, the first difference GMM estimator provided biased results in finite samples.

We apply the two-step estimation technique. The use of this technique is explicated by the fact that the estimator found is more efficient than the one-step one (Roodman, 2009). Certainly, the two-step estimation is more precise than the one-step one since it takes into consideration the structure of the error variance-covariance matrix.

The efficiency of the estimation of System GMM is based on the validity of two tests. First, the Sargan/Hansen overidentification test which allows testing the validity of lagged variables as instruments. Second, the autocorrelation test of Arellano and Bond (1991) where the null hypothesis is the absence of second-order autocorrelation of errors (AR test). In our study, we note that Hansen's overidentification test does not allow us to reject the hypothesis of validity of lagged variables in level and difference as instruments. On the autocorrelation test, we observe the presence of a first order effect (AR1), which is consistent with the hypotheses formulated, and an absence of second order autocorrelation (AR2). The findings from the estimation technique are presented in Table 1.

4. Empirical results

The estimation results in Table 1 show that the impact of human capital on economic growth is positive and significant. This result shows that enrollment of the tertiary school has a significant effect on the growth rate in the North African countries. This result is consistent with that of Oketch (2006) and Ogundari and Awokuse (2018) who pointed out that human capital makes a significant impact on per capita GDP growth in North African countries.

Moreover, the index of economic freedom coefficient has a positive sign and therefore, it is statistically significant, suggesting that economic growth is stronger when economic freedom is high because it makes for a more efficient economy. This finding is consistent with the study of De Haan and Sturm (2000) and Brkic et al. (2020) who argued that greater economic freedom fosters economic growth.

Table (1) displays the regression results based on interaction specification using an interaction term between institutions and the human capital. In this specification, we relied on the interaction term to establish the contingency. If the term is positive and significant, this would imply that the effect of human capital on economic growth increases with institutions. The first thing to note is that the sign of the coefficient of the interaction term between human capital and the degree of economic freedom is positive, implying that human capital and the degree of economic freedom act as complements. In other words, an improvement in the quality of institutions reinforces the positive impact of human capital on economic growth in North African countries. This supports previous empirical studies that have highlighted the complementary role of human capital and institutional quality on economic growth (Doré and Teixeira, 2023).

Table 1. The economic growth effect of institutional quality and human capital

Variable	Value (probability)
Initial GDP per capita	-0.471***
	(0.008)
Human capital	0.246**
	(0.041)
IEF	0.121*
	(0.081)
IEF*Human capital	0.02*
	(0.071)
Inflation	-0.421****
	(0.047)
Government size	0.771*
	(0.062)
Constant	0.182*
	(0.098)
AR(2) test (p-value)	0.825
Hansen-J-Test (p-value)	0.287

Notes: The dependent variable is real GDP per capita growth. Annual data from 2000–2021. Robust standard errors are in parentheses below the coefficients. *p < 0,1; **p < 0,05; ***p < 0,01.
Source: authors' estimations.

In fact, most of the findings about the other explanatory variables are consistent with expectations. The convergence theory is verified in this study with the lagged GDP per capita. In the estimates, we see that the estimated coefficient is negative and significant at the conventional level of testing. This result is consistent with the neoclassical model which postulated that the economy tends to approach its long run position if the starting per capita income is low. This result then supports the conditional convergence hypothesis in which case growth is faster in poor countries than in richer countries. This result validates the work of Barro and Sala-i-Martin (1997) and Sachs and Warner (1997). The result also confirms a significant negative effect of inflation on real GDP growth. This result implies that greater macroeconomic instability via the variability of inflation negatively affects global economic growth in the region of North Africa. Therefore, this result corroborates the work of Aydin et al. (2016). Furthermore, it is revealed that government spending exerts a positive and significant effect on economic growth. This finding is consistent with the study of Poku et al. (2022).

5. Conclusions

The economic challenges facing some North African countries have long been a source of concern. These challenges are linked to a range of complex factors. Despite the region's diverse resource and human resources, it faces a variety of challenges that hamper its economic growth. Poor infrastructure, limited access to education and health care, and political instability are among the main factors that have contributed to the economic challenges facing many North African countries. In addition, high levels of corruption and ineffective governance have often hampered investment and hampered the efficient allocation of resources. Many countries in the region also suffer from a lack of economic diversification, relying heavily on a few commodities, making them vulnerable to fluctuations in the global market.

Lack of sufficient institutional quality has a negative impact on economic affairs and the negative impact on economic growth is a major challenge for many North African countries. Poor governance, rule of law and regulatory efficiency are all indicators of institutional quality, all of which are essential to create a climate conducive to economic success. However, the region has had to contend with inadequate institutions, which have hampered effective governance and economic development. Indeed, poor institutional quality can lead to political instability, corruption and weak laws, which hinder domestic and foreign investment. The North African region has made progress in areas such as reducing inflation and improving macroeconomic stability, but persistent

structural constraints, including poor governance and weak institutions, continue to hamper economic growth.

In this context, the paper examines the moderating effect of institutional quality and human capital on the economic growth of 4 North African countries (Tunisia, Morocco, Algeria and Egypt) over the 2000-2021 period. The importance of institutional quality and human capital on economic growth is widely accepted by economists with only a few exceptions. Nevertheless, in spite of having natural and human resources, many North African countries cannot catch up with the developed countries because of poor institutional quality. Therefore, the most important novelty is the study of transmission channel: economic institutions (measured by the index of economic freedom) through which human capital affects economic growth in North African countries. The findings approve that both institutional quality and human capital have a significant positive impact on economic growth. Therefore, it can be resolved that there is sufficient evidence to support that the institutional quality and the human capital are essential for economic growth. The findings also advise that institutional quality and human capital have a positive complementary effect on economic growth. Furthermore, the results indicate that government size positively influence economic growth. On the other hand, inflation affects economic growth negatively.

According to the study, governments in these countries should propose and implement significant measures to improve health and education systems. The expected policy is to improve the quality of health and education, ensure sufficient investment in both sectors and make access to health and education systems as simple as possible. This will help increase human capital while increasing the overall well-being and productivity of the region's people. In addition, governments in each country should invest in expanding the employment prospects of young graduates. Giving more space to the skills and knowledge of todays and tomorrow's generation would also boost the growth and development of North African countries. Implementing these measures could help North African countries foster economic growth in the near future.

Addressing the complex challenges posed by weak institutions and inadequate human capital development in these countries requires a comprehensive and coordinated effort. Policymakers, stakeholders and international organizations must collaborate to bring about beneficial change through a multidimensional strategy.

A crucial step to overcome the mentioned problems is to implement significant institutional reforms aimed at strengthening governance, reducing corruption and enhancing the rule of law. At the same time, investment in human capital development is essential. Governments should focus on education and health care, investing sufficient funds to ensure access and quality. This is about equipping workers with the skills and knowledge needed for creativity and productivity. Access to vocational training, skills development programs, and health services must be increased by governments in each country to progress the overall capacity of the workforce.

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