Does Human Capital Have An Impact On Employment In Turkey? An ARDL Analytical Perspective

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ABSTRACT: Human capital plays a key role in most production function of economies. In Solow growth model, labor is more efficient and effective per capital when the human capital is well developed. Most research on human capital and employment are centered around microeconomic principles. Thus, focusing firms, and role highly skilled labor play in self-employment, return on sales and investment, business growth and employment opportunities. This study puts an emphasis on the macroeconomics aspects of human capital and employment. Accordingly, this study seeks to answer the question "Does Human Capital have an impact on Employment in Turkey". Employing data from 1990 – 2019, Human capital (proxied by means, years of schooling, life expectancy at birth, and labor force participation rate) has a long run relationship with employment according to the Bound test we conducted. This suggests that the short run relationship conducted is spurious. More so, health and educational expenditures, and inflation were employed as a policy control variable within the model.

We found out that while life expectancy at birth and labor forces participation had positive coefficient with employment, mean years of schooling had a negative impact on employment. As a matter of policy recommendation, a more aggressive policy geared towards job creation, monitoring labor market volatilities, ensuring that labor laws are followed to the latter, stabilizing inflation, and attracting more private sector business expansion is critical in having a sustainable employment opportunities and reduction in unemployment.

KEY WORD: Human capital, Employment, Education, Health Expenditure

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I. INTRODUCTION AND LITERATURE REVIEW

Human capital is a key component of neoclassical economics theory. The Solow growth model is rooted firmly in capital and effective labor. Capital can be summed up as the factor of production employed to generate goods and services. The human component is the active agent that takes charge of all economic activities such as production, consumption, and transaction. Kwon & Yi (2009) emphasized that human capital stipulates one of the factors of production element which can generate additional values to goods and services through inputting it into the production process.

Development does not happen in isolation and needs certain core pillars to be realized. The process of development is centered on key variables such as inclusive economic and political institutions (Acemoglu, 2010), human capital, physical capital, natural and power resources which determine the pace of economic growth (Khan & Chaudry, 2019). Human capital development means a systematic and planned activity for human capital to learn necessary skills to meet current and future job demands. Schultz (1960: 1999) asserted that human capital is like other types of capital. Production can be improved through investment in human capital. Su and Liu (2016), Dinda (2016) stressed that human capital in classical economics is seen as skill and knowledge and not as the labor force.

Alfred Marshall (1920) emphasized the importance of education as a national expenditure, and he believed that the investments made in human beings are the most precious and important. Schultz (1962) discovered that a significant increase in agricultural productivity occurred in many countries not because of land or physical resources, but because of new skills and improved knowledge. Investing in the knowledge and skills development of people through education and health is pivotal in developing human capital. The improved human resources have become more useful to a state in so far it has the economic structures with high

absorptive capacities. The returns of the high education and improved health are translated into new ideas and improved productivity of the firm.

Getting a job that matches one's skills has been a very tedious task. Turkey like any other emerging economy is battling with unemployment menace. The labor force participation rate in Turkey stood at 50.5% with a 3.0 percentage point decrease in December 2020. The Turkish Statistical Institute (Turkstat) reported that unemployment and employment rates were 12.7 percent and 44.1 percent respectively in December 2020. Turkey was ranked 54th out of 189 countries in the UN Human Development index report of December 2020. This showed a 40.7 percent improvement in human development over the past 2 decades.

Similarly, expenditure on health and education which are fundamental pillars of human capital development has received a significant push. Turkstat's report revealed that 18.2% of gross domestic product (GDP) was spent on education in 2019. That is about 74 percent of education expenditure was paid from public sources. Therefore the importance of human capital development for the Turkish government cannot be overemphasized.

Despite all this investment, a 12.7 percent of unemployment (ages 15-64) is greatly alarming. This study seeks to interrogate the relationship between the investment made in human capital and its impact on employment. Several works have been done within the areas of human capital, and economic growth. Only few works are available on this subject, majority of which relates to the firm's performance and employee performance, as well as placing emphasis on the micro analysis. This study seeks to focus on the macroeconomics viewpoint and using Turkey, an emerging economy, as a study area. This is the gap this work seeks to fill.

Turkey's Human Capital Investment

Fisher (1906) views human capital investment as any measure taken to improve productivity for the sole purpose of increasing future revenue. Barro and Sala-i-Martin (2004) connote human capital to private capital and explained it as the accrual cost of health support (expenditure), general and special education expenditures, costs in relations with job search, vocational training at a production site, labor movement and seeking information on prices and wages.

The Turkish government places the development of its human capital as a key component of its development agenda. Starting with improvement in the health sector, the coming into force of the Health Transformation Program (HTP) helped improve the health system and has succeeded in making Turkey a health tourism hub. The HTP was in its comprehensive form after coming into force in 2003 (Esen & Keçili, 2021). According to the World Bank (2020) health expenditure from as a percentage of GDP rose from 8.6% in 2000 to 10% in 2016. The government accounted for 74% within this period. Turkstat (2020) reported that total health expenditure by 2019 has increased by 21.7%. Government's share of this expenditure raised to 22.5% (156 billion 819 million TL). The private sector accounted for 18.8%.



Figure 1. Health Care Expenditure (% of GDP) 2010-2019

source: All data are from Turkstat (2020)

The health of the population is a critical lifeline of the economic prosperity of Turkey. Esen & Keçili (2021) are of the view that investment in health aids in the restoration and maintenance of man's creative powers, hence preserving labor force numbers and expanding labor potential. Such investments have a substantial impact on the development of the next generation's human capital. High rates of population physical and mental health are the primary prerequisite and basis for the accumulation of human capital, and a poor level of health makes it useless in other areas of investment, preventing the accumulation of health capital.

Investing in education is way of developing human capital. The effectiveness of labor depends on the training, knowledge levels, experience, skills and technological proficiency of the workforce. Evidently, the Turkish government has put in significant strides to create access to education, improving the teaching, learning and training curriculum as well as providing the necessary infrastructure. The private sector plays a key role in this process as there is an overwhelming high quality private education institution in Turkey. The total expenditure on education as a percentage of GDP increased from 5.5% in 2011 to 6.0 in 2019. That is, an increase from 77 billion TL to 259.2 billion. Expenditure per student increased from 4,008 TL to 11,769 TL within the same period (Turkstat, 2020).





In 2019, a total of 259 billion 220 million TL was spent, representing an increase of 18.2 percent over 2018. Education spending grew the highest in primary education (31.9%) and the least in secondary education (26.4%) in 2019 when compared to the previous year (Turkstat, 2020).

Education and health are mutually inclusive components. Education is vital component of health production. An educated person understands the need to live a healthy life, the potential harm of some actions and the consequences of health on their functional capabilities. People in good health are more cautious with their savings because they assume they will live longer. The state of one's health is determined not only by one's earnings, but also by how they are distributed—consumption, savings, and investment.

Literature available about whether human capital plays a key role in employment opportunities is very scanty. Most of the available literature relates to human capital and economic growth.

It is well documented that employment outcomes vary significantly among regions and countries. The extent to which human capital, as measured by the share of prime age of individuals with education and health, has favorable external impacts on labor force participation and employment. This hypothesis was investigated by Walters (2013) for inhabitants of U.S. metropolitan areas. The empirical findings form the study imply that the degree of local human capital has favorable externalities on both women and men's chances of labor force participation and employment.

Curtis (1998) stated that cities with higher average levels of human capital in metropolitan areas in the United States should experience faster employment growth. A positive, significant, and consistent relationship between human capital and MSA growth was discovered using data from all U.S. metropolitan areas (MSAs) from 1940 to 1986. Spillovers across cities within MSAs were also observed: city employment growth was positively associated to human capital elsewhere in the MSA. However, disparities in human capital between cities helped explain differences in job growth within MSAs, implying that human capital impacts are at least somewhat localized at the city level. Similarly, Poelhekke (2013) also reported in his work on metropolitan area in German that the rise in highly skilled workers created a faster urban employment growth in former East and West Germany taking into accounted the data between 1976 and 2003.

source: All data are from Turkstat (2020)

Lepak and Snell (2002) evaluated the characteristics of human capital as well as the human resource designs used for employees in four different employment modes, thus, knowledge-based employment, job-based employment, contract labor, and alliance/partnership. Using data from 148 companies, they realized that strategic value and uniqueness of human capital is not the same for the employment modes. Within the scope of job style, each human resource configuration is related to a particular job style.

Rauch, Frese and Utsch (2005) denoting human resource by 3 variables (human capital of business owners, human capital of employees, and human resource development and utilization) explored how they affect employment growth of small–scale enterprises. Employing longitudinal data from 119 German business owners, the result of the study indicates that business owners' human capital as well as employees human resource development and utilization affect employment growth. In conclusion, they posited that human resource is a significant determinant of small–scale enterprises growth.

Roca Puig, Beltrán Martín and Cipres (2012) examined how temporary employment and organizational size moderate the effect of human capital on firm performance. Their result indicates that, on the return of sale, larger firms with low temporary employment experienced positive effect of human capital on sales returns. However, they noted that the positive effect should not be considered as arbitrary as they found evidence that in some cases the effect is not significant.

Sanders and Nee (1996) investigated how self-employment among Asian and Hispanic immigrants is affected by family composition and human capital/class resources. Their results show that human capital is important in immigrant self-employment determination. Hossain and Lamb (2012) also examined the impact of human and social capital on employment income opportunities for Aboriginal Canadians. They suggested in their conclusion that social capital and human capital proxied by education and health status had a major influence on Aboriginal Canadians level of employment income.

In reference to influence of human capital and employment on innovation, Bornay Barrachina, la Rosa Navarro, López Cabrales and Valle Cabrera (2012) using data from 150 innovative Spanish firm found that human capital favors innovation whereas employment relations do not directly influence innovation unless human capital is involved in the process.

Wong and DeGraff (2009) studied the relationships between the wealth of older adults and their earlylife decisions regarding investment in human capital, family formation, and work activities in Mexico. The result of the study posited that old-age financial wealth in Mexico is more closely associated with family formation and human capital decisions than with employment decisions over the lifetime.

Conti and Sulis (2016) investigated the relationship between human capital. employment protection and growth. The study revealed that technology adoption depends on the skill level of the workforce and on the capacity of firms to adjust employment as technology changes.

Khan and Chaudhry (2019) estimated the impact of human capital on GDP growth and employment in developing countries. Using Panel data techniques and data for between 1996 to 2018, their results showed that life expectancy and educational expenditure (proxies for human capital) are significant determinants of growth and employment opportunities.

From the above literature, it clear that most of the works done are more focused on microeconomics analysis and seldomly on macroeconomics. The works lays emphasis on firms' performance rather the general employment situations. This study seeks to focus more macroeconomics analysis and lays more light on government policies, specific to Turkey, that could propel an increase in general employment rate.

1.1 Objective of The Study

The study aims to examine the effect of human capital on employment in Turkey.

1.2 Research Question

To this end, the study seeks to interrogate and find relevant answers to these questions.

- A) What is the impact of human capital on employment opportunities in Turkey?
- B) Does Human capital influence employment opportunities?

1.3 Research Methodology and Analysis

This study examines the impacts of human capital on employment and economic growth in the light of hypotheses by using annual data between 1990-2019. The data is taken from World Development Indicators (WDI), the Turkish Statistical Institute (Turkstat), and the Ministry of Education of Turkey (MEB). We follow the methodology employed by Khan and Chaudhry (2019).

The functional model is expressed as

The econometric form is given as follows:

Whereas: EMP=Employment Rate EDU= Education expenditure as a percentage of GDP LEB= Life expectance at birth LPR= Labor Force Participation rate MYS= Mean years of schooling INF= Inflation HEXP= Health expenditure as a percentage of GDP

In this study life expectancy at birth, labor force participation rate and mean years of schooling are used as a proxy variable for human capital. Health expenditure, Education expenditure, and inflation are used as control variables for policy effectiveness. The model will look at the relationship between human capital and employment rate in Turkey.

Table 1. Descriptive Statistics							
Variable	Obs	Mean	Std. Dev.	Min	Max		
emp	29	1.331	.062	1.245	1.459		
lebp	29	1.854	.025	1.808	1.889		
hexp	29	.541	.194	.167	.74		
lpr	29	1.7	.029	1.654	1.755		
mys	29	1.856	.082	1.706	2.018		
edu	29	1.469	1.252	.352	3.91		
inf	29	1.359	.459	.796	2.022		

Table 1. Descriptive Statistics

The employment rate (emp) id refered to as the percentage per hundred thousand of the working population aged 15 years and bove. It is used as the dependent variable in this paper. It provides a glimpse of the percentage of working population who gains employment. The data was extracted from the World Development Indicators (WDI). Human capital is indexed by mean years of schooling (mys) and life expectancy at birth (lebp). In most empirical works these proxies (mys and lebp) are used to represent human capital. Mean years of schooling data was extracted from MEB data. Health expenditure (hexp), education expenditure (edu) and inflation rate (inf) are used as policy control variables for the model. Their data was sourced from the Turkish Statistical Institution.

Estimation Results

Unit Root tests will be conducted to ascertain the null of a unit root against the alternative of stationary. The Bounds test will be conducted because it is more effective than the Engen and Granger (1987) cointegration techniques, and can be applied to models irrespective of whether the variables are I(0) or I(1).

variable	ADF at level		ADF at First D	ADF at First Difference		
	Constant	Linear Time trends	constant	Linear Time trends		
emp	0.911681	-0.7978	-4.6806***	-4.13066**	I(1)	
hexp	-2.1199	-0.7333	-4.1374**	-4.4485**	I(1)	
edu	-3.1087**	-3.1003	-6.7633***	-6.6323***	I(0)	
gdp	-5.6596***	-5.7225***	-9.1542***	-8.9418***	I(0)	
mys	-1.5872	-4.0120**	-5.3173***	-5.1668**	I(0)	
inf	-1.0073	-0.8547	-4.2924**	-4.2977**	I(1)	
leb	-3.5510**	1.6029	-0.6156	-11.2443***	I(0)	
lpr	-2.1654	-0.5458	0.1670	-6.3413***	I(1)	
Note: ***, **, and * represents the rejection of null hypothesis of unit root at 1%, 5% and 10% significance levels respectively.						

Table 2. Augmented Dickey-Fuller Unit Root Test

From table 1, the Augmented Dickey-Fuller unit root test results shows that edu, gdp, mys and leb are integrated of order zero I(0) series whiles emp, hexp, lpr and inf are integrated of order one I(1). Similarly, the Philips-Peron unit root result in table 2 below shows the same integrated of order I(0) and I(1) as in the table afore.

	Constant		1/	I Difference	Conclusions
	Constant	Linear time trends	Constant	Linear time trends	
emp	0.9072	-0.8267	0.0009***	-5.1310**	I(1)
hexp	-2.0095	-0.8202	-4.1796**	-4.4879**	I(1)
edu	-3.0922**	-3.1471	-6.7633***	-6.6323***	I(0)
gdp	-5.9724***	-8.7491***	-19.0094***	-18.4307***	I(0)
mys	-1.2405	-3.5566*	-5.0094***	-3.9836**	I(0)
inf	-1.0401	-1.0246	-4.3375**	-4.3309**	I(1)
leb	-6.3719***	0.3961	0.2408	-2.3654	I(0)
lpr	-1.8169	-0.2872	-4.7544***	-6.3765***	I(1)

Table 3. Philips-Per	ron U	Unit	Root	T	est
		_			

Table 4. Kwaitkowski-Philips-Schmidt-Shin (KPSS) Unit Root Test

Variables	KPSS Unit at I	it at Level KPSS at 1st Difference		fference	Conclusion
	Constant	Linear Time Trends	Constant	Linear Time Trends	
emp	0.624186**	0.153331**	0.287678	0.100840	I(1)
hexp	0.490475**	0.166193**	0.345497	0.083257	I(1)
edu	0.140941	0.093405	0.212576	0.211255**	I(0)
gdp	0.123052	0.154948**	1.87760	0.178375**	I(0)
mys	0.627311**	0.101227	0.445065	0.482143**	I(0)
inf	0.555109**	0.110280	0.244772	0.199904**	I(1)
leb	0.686853**	0.186318	0.596941**	0.082094	I(0)
lpr	0.2952	0.1774**	0.5420**	0.0825	I(1)
Note: ** represents the rejection of null hypothesis of stationarity at 5% significance level					

The KPSS unit root tests has the null hypothesis of stationarity. Its is mostly used to confirm the results realized in the Philips-Peron and ADF unit root test. The results of the KPSS confirms the ADF and Philips Peron unit root results.

ARDL Long Run Form and Bounds Test

Due to the mixed series integrated order of the variables. The Bounds test propounded by Pesaran, Shin and Smith (2001) is much appropriate for cointegration analysis. This is because the Bounds test accommodates a mixed integrated series in determining the long run and short run relationship among the variables. The null hypothesis (H_1) is that there is no cointegration equations among the variables. The alternative hypothesis (H_1) simply suggests that the null hypothesis is not true.

The null hypothesis is rejected if the F-statistics value is greater than the critical value for the upper bound I (1), then we can conclude that there is cointegration. Thus, there is a long run relationship between the variables. Hence the null hypothesis of no cointegration equation. The Error Correction Model (ECM) can be estimated to show the long run relationship.

However, if the F-statistics values is lower than the critical value for the lower bound I (0), then we can conclude that there is no cointegration among the variables, therefore, there is no long run relationship. We do not reject the null hypothesis. The short run estimation model, which is Autoregressive Distributed Lag (ARDL) model is conducted.

The test is considered inconclusive if the F-statistics values lies between the critical values for the upper bound and lower bound, I(0) and I(1).

F-Bounds Test			Null Hypothesis: No	levels relationship
	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	25.79527	10%	1.99	2.94
k	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

From the Bounds test results both models has F-statistics values greater than the critical values for the upper bound I(1). Hence, we reject the null hypothesis of no cointegration for the models. This means that employment rate (emp) has a long run relationship with human capital. Therefore, the error correction model (ECM) is conducted. The ECM model is stipulated below:

	Long run estimati	Long run estimation		ion
	Coefficient	T-statistics	Coefficient	T-statistics
mys	-0.1232	-2.1901**	-0.0116	-0.4374
lebp	3.2569	16.5636***	3.1612	1.5594
hexp	-0.0229	0.3337	-0.0093	-0.3427
edu	-0.0043	-3.0695**	-0.0010	-1.1619
lpr	1.1364	8.5534***	0.9666	7.9957***
inf	-0.0409	-2.7197**	-0.0092	-1.0184
С	-6.3966	-22.8008***	-0.0028	-0.4541
ECT			-0.5973	-2.7293**
R-squared		ł	0.851266	I
F-Statistics			12.16224	
Prob			0.00012	

Table 6. Long Run Estimation and Error Correction Model Result

The equation employed in estimating the error correction model is shown below:

The Schwarz information criteria (SIC) was used for the model selection in the ARDL regression. The bound test showed and long run relationship between employment and human capital. Using the SIC model selection criteria given by the bound test together with the generated error correction term, the short run form was estimated suing the ordinary least squares method (OLS). Table 6 has both the long run and short run results of the model. In the short run only the labour force Participation rate was significant. The speed of adjustment to convergence in the long run is given by the ECT, which is -0.5973. It implies that short run errors will be corrected in the long run at an adjustment speed of 59.73%.

The long run results showed that all the variables were significant except hexp which is insignificant and has a negative coefficient. The human capital proxies lpr and lebp had a positive coefficient whiles mys had a negative coefficient. This could be explained in part that Turkey has a youthful population with an average age of 32.2years (Turkstat, 2020; Mundi Index, 2021) coupled with 18years of schooling life expectancy means that the more they spend time in school, the employment rate falls. Similarly, when the labour participation increases (graduates joining the active labour force in the job market), it increases the employment rate. The joint significance of the human capital proxy was significant at 1%significance level.

Diagnostic tests were conducted to check how good the model is. Table 7 displays the results of the Breusch-Pagan- Godfrey heteroskedasticity test and the Breusch-Godfrey Serial Correlation LM test for both the short and long run forms.

Table 7. Diagnostic checks					
Long Run Heteroskedasticity Test: Breusch-Pagan-Godfrey Breusch-Godfrey Serial Corr. LM T					

		Prob. Value		Prob. Value
F-statistics	0.874117	0.5940	1.964291	0.1864
Obs* R-squared	12.59322	0.4797	7.105277	0.0286
Short Run				
F-statistics	0.207364	0.9853	0.772354	0.4794
Obs* R-squared	2.311593	0.9699	2.427509	0.2971
Note: the null hypothesis no serial correlation and homoskedasticity is rejected at the 1%, 5% and 10% significance level.				

The results above we reject the null hypothesis of homoskedasticity for both the short and long run forms. This implies that the variables are heteroskedastic. Similarly, LM serial correlation results how that the variables are serially correlated. This suggest that the model is good one.

To understand the impact of the proxies of human capital on employment, the Wald Test was conducted to properly understand the joint coefficient significance of the proxies.

Table 8. Joint Coefficient Significance Test (wald Test)				
Test Statistic	Value	Df	Probability	
F-statistics	1.403495	(3.13)	0.2862	
Chi-square	4.210485	3	0.2396	

Table 8. Joint Coefficient Significance Test (Wald Test)

the null hypothesis of the coefficient being zero is reject at the 10%, 5% and 1% levels of significance. This means that the coefficients of the proxies account for some variation in employment rate.

II. Discussion of Results

Human capital undoubtedly plays an important role in economic growth and to some extent provide higher chances of employment opportunities. Despite the challenges imposed by covid 19 globally, Turkey recorded a 44.1% employment growth as at December 2020. Evidently this growth is predominantly within the health sector.

From results above, the joint coefficient diagnostics means that in the long run human capital has an impact on employment rate. Specifically, labor force participation (lpr) and live expectancy at birth (lebp) increase employment rate (emp) by 1.14% and 3.26% respectively when there is a percentage increase in both variables in the long run. This could be partly explained by the fact from the active labor force in Turkey has been growing exponentially as results of the youthfulness of the population as well as four hundred thousand (400.000) students on average graduate with first degree every year. Additionally, with the level of investment within the health sector the life expectance at birth has been increasing. This means that there is a longer life span of labor and hence the prospect of having enough labor is not in doubt. However, mean years of schooling (mys) rather affects employment rate negatively by -0.12% when it experiences a percentage change in the long run. This means that an additional year of schooling spent by a Turkish means his/her chances of getting employed at after graduation is reduced by 0.12 percent. This could be partly explained by the influx of migrant (both skilled and unskilled) who work for wages below the minimum wages. Most Turkish young graduate hardly accept such wages and would rather prefer not to work than take poor wages. Already there has been a controversy around the number years spent by the Turkish people in schools.

As a matter of policy, educational expenditure (edu), health expenditure (hexp) and inflation were used as policy control variables. In the long run, an additional spending in education and health expenditure translates into 0.004% and 0.023% decrease in employment rates. Expenditure in education (to create more access) means that more young people who form majority of the labor force will be in school. It is important to also state that health expenditure in the long run is statistically insignificant. Inflation was also statistically significant and has a negative impact on employment rate in the long run. An increase in inflation rate coupled with migrants flooding the labor market and reducing the wages labor. This makes its quite difficult for the youth in Turkey to get jobs.

From the Bounds Test the F-statistics is greater than the upper values which suggest that there is long run relationship. So, the short run results will converge in the long run with the speed of adjustment of the error correction term (ect) by -0.597%.

III. Conclusion

Human capital has been an evolving concept for decades. It plays vital role in development and economic growth. Modern economists consider it as an endogenous factor which makes labor more efficient and effective. The health status, educational levels, skill, experiences and knowledge of labor plays a critical role in his / her employment prospects. Most studies conducted on the performance of employee and creation of employment brought to the fore the significant position human capital plays within the performance and employment space, which translates into higher returns on sales, investment, and expansion of business to create more employment opportunities. This study showed that the more time people spend in school the lower of their

chances of being employed. This due to the size of the active labor force participation, influx of skilled and unskilled migrant, business trying to pay wages below the current market price which is boosted by continuous rise in inflation. Rigorous expenditure in the health and educational sector, as well as rise in seasonal employment provides a temporary antidote to the rise in unemployment. In the long run human capital several empirical works have a positive relationship with economics growth. This could translate into expansion of the economy and create more employment opportunities. Therefore, spending in health and education develop the human capital resource of Turkey is crucial notwithstanding the youthfulness of the active labor force.

Considering the advantage at hand, and the results of the analysis, a shift in government spending to create more business opportunities is crucial in the absorption of available labor force. A more aggressive policy towards job creation, monitoring labor market volatilities, ensuring that labor laws are followed to the latter, stabilizing inflation, and attracting more private sector business expansion is critical in have a sustainable employment opportunities and reduction in unemployment.

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