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EVALUATING THE EFFECT OF COVID-19 ON THE PALESTINIAN ECONOMY BY ESTIMATING THE RELATIONSHIP BETWEEN ECONOMIC GROWTH AND UNEMPLOYMENT IN PALESTINE

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Abstract:

The Palestinian economy is a small and open economy that is characterized with a high level of uncertainty. The purpose of this paper is to determine the effect of COVID-19 on the economic growth in Palestine through estimating the relationship between economic growth and unemployment. We will use the GDP per capita to measure economic growth and unemployment rate in Palestine. Thus we will also look at the Palestinian labor force and determine whether the job creation is successful in absorbing the rising rates of unemployment and determine how COVID-19 will affect unemployment rates. This is an effort to study where the Palestinian economy is heading and gives suggestions of how we can avoid the convergence into a Volatility Uncertainty Complexity Ambiguity environment. The data was taken from the Palestinian Central Bureau of Statistics for the period from 1995 to 2018. The time series analysis indicated that a 1 percent increase in the unemployment rate will result in a 0.356 percent decrease in the GDP per capita. Given the continuation of the Israeli occupation, the Palestinian government plays the role of "crisis management".

Key words: COVID-19, Economic Growth, Fully Modified Least Squares Method, Palestinian Economy, Unemployment Rate

1. Introduction

The fast spreading COVID-19 epidemic had claimed an increasing number of lives and caused an unprecedented disruption in the world economy. In December of 2019, the first COVID-19 cases had manifested in Wohan-China. Since then the virus had spread throughout the globe. On January 30th 2020, the World Health Organization (WHO) had declared COVID-19 as an international public health concern which was elevated to an epidemic six weeks later. As a result, many governments and health authorities implemented strict measures to contain the epidemic that included cancelation of events and non-essential social gatherings, community lockdown, movement restrictions, travel restrictions. And social distancing. The empirical data indicated that countries that

governments that acted swiftly and early may have aided in limiting the spread of the virus and flattening their epidemic curves (Yezli and Khan, 2020).

China was a good example of the countries that implemented strict policies aimed at social distancing. The strict measures that were followed in China to enforce social distancing had proven to be effective. Nonetheless, these policies came at a high cost resulting in an increase in short term unemployment and a reduction in output. Meanwhile other countries had reacted more timidly either by deliberate choice –as the case in the United States- or as an implementation constraint –as in some European countries (Chudik, Pesaran, and Rebucci, 2020).

On March 7th, the Palestinian government implemented strict policies in order to stop the spread of COVID-19 in the Palestinian territories. They temporarily closed down churches, government offices, schools, public transportation, entertainment activities, mosques, and universities. The Palestinian government had also prohibited large gathering. All these strict measures were taken to stop the spread of the disease early on and not fall in the path that Italy and Spain had fallen into. So the idea was quick and a firm response and not worrying about economic losses.

The Palestinian economy is a small and open economy that is characterized by a high level of uncertainty. In 2018, the Palestinian economy achieved a sluggish growth – which was an extension of the slowdown that existed in 2017, this was reflected in the weak performance of economic activities, a decrease in both private and public consumption, an increase in unemployment rate, a slowdown in the growth rate of wages, and drawback in the private sector spending and investment due to the increase in the level of political uncertainty prospective (Palestine Monetary Authority, 2018).

The overall annual growth rate in the Palestinian economy had reached 4.7 percent in 2016, and 3.1 percent in 2017. However, this decline in the growth rate had continued to drop to reach 0.6 percent in 2018 (Palestine Monetary Authority, 2018).

It is a widely accepted fact in economics that an increase in the GDP of an economy will reduce the unemployment rate and thus increase employment. The theoretical proposition relating output and unemployment is known as Okun's Law. This is one of the most famous propositions that exists in macroeconomics and this relationship holds true for several countries and regions especially in the developed countries (Lee, 2000; Daniels & Ejara, 2009). The high and increasing rates of unemployment is one of the major factors that led to the spread of the Arab Spring. It is also one of the most important challenges facing the Palestinian government (Samarah, 2017). The high rates of unemployment indicate a deficiency in the labor market, increase poverty, and spread the indecent standards of living.

The newly developed semi-independent Palestinian economy is following the same economic growth and development path as the majority of the Arab countries (Samarah, 2017). They are suffering from a stagnant or a shrinking agricultural and industrial sector and an increase in the service sector. In addition, the Palestinians face an extra challenge presented by the continuation of the Israeli occupation.

The purpose of this paper is to estimate the economic losses due to policies implemented by the Palestinian government in order to stop the spread of COVID-19 through determining the relationship between unemployment and economic growth in

Palestine. This will aid us in determining whether the Palestinian economy is converging to a Volatility, Uncertainty, Complexity, and Ambiguity (VUCA) environment. One thing to keep in mind is that the Arab Spring was not the only avenue that leads to a VUCA environment in the Middle East. Foreign powers also play a role in pushing an economy to a VUCA environment (Samarah and Tuncay, 2020). In the case of Palestine, Israel is an important player in the Palestinian economy.

We will look at the GDP per capita and the unemployment rates in Palestine. We will also take a closer look at the Palestinian labor force.

The importance of this paper lies in the fact that it will discuss the concept of unemployment. Unemployment is an extremely important concept due to its impact on the economic, political, and social systems of a society, prior to the Arab Spring; the North African countries were characterized with a high unemployment. “The unemployment rate remained high in all the countries, averaging over 11 percent for the group” (Khan & Mezran, 2016, p. 3). In addition, education had also played a substantial role, “We develop our argument by first presenting evidence by this expansion of the education in the Arab world was indeed matched with poor labor market prospects, and particularly so in the countries that have been at the heart of the protest wave” (Campante & Chor, 2012, p. 169). This had contributed to the argument that the lack of economic opportunities to an increasingly educated society had aided in the understanding of regime instabilities such as that of the Arab Spring (Campante & Chor, 2012, p. 184).

The rest of the paper will proceed as follows; the next section will take a closer look at the Palestinian labor market; a review of the relevant literature; the time series analysis will be discussed in the methodology; the result section will display the output from the econometric analysis; and finally the conclusion.

2. The Palestinian Labor Force

The Palestinian economy is in an undesirable situation. Given the stagnation in the peace process, the Palestinians cannot achieve their ultimate dream of having an independent Palestinian state. This creates a situation where policy makers play the role of crisis management.

Given the crisis management situation, the Palestinian labor force continues to supply a relatively cheap labor to the Israeli economy (Samarah & Rahman, 2017). Thus the Palestinian labor force continues to be dependent on Israeli markets. Table 1, shows the number of Palestinians that work in Israeli and Israeli settlements, in addition to a number of macroeconomic indicators.

Table 1: Macroeconomic Variables for Palestine for the Period 1995 to 2018

Year	Real GDP Per Capita (\$)	Unemployment Rate (%)	Labor Force (Thousands)	Palestinian Working in Israel (Thousands)
1995	2355.2	18.2	514.8	68.2
1996	2249.2	23.8	559.6	60.1
1997	2442.2	20.3	599.0	81.6
1998	2701.0	14.4	637.1	118.4
1999	2830.2	11.8	667.3	135.2

2000	2506.5	14.3	667.0	113.5
2001	2208.0	25.3	642.0	69.7
2002	1877.6	31.2	657.0	49.1
2003	2080.1	25.5	722.0	54.7
2004	2229.6	26.8	752.0	50.3
2005	2396.0	23.5	789.0	62.6
2006	2233.0	23.7	834.0	59.7
2007	2308.4	21.7	882.0	62.6
2008	2379.1	26.6	908.0	75.1
2009	2511.5	24.5	951.0	73.2
2010	2637.3	23.7	976.0	78.1
2011	2877.1	20.9	1059.0	83.5
2012	2967.5	23	1114.0	83.2
2013	2944.0	23.4	1156.0	99.4
2014	2852.4	26.9	1255.0	102.1
2015	2863.9	25.9	1299.6	112.7
2016	2922.9	26.9	11339.3	117.2
2017	3072.4	27.4	1374.6	130.7
2018	3021.4	30.8	1384.0	127.2

Sources: Palestinian Central Bureau of Statistics (2018). Website www.pcbs.gov.ps

Looking at the unemployment rate, we notice that the lowest rate reached was 11.8% in the year 1999. This was before the beginning of the Second Intifada. Since then the Palestinian economy was unable to recover and the unemployment rate continued to grow to reach 27.4 in 2017. We also notice that the number of Palestinian working in Israel continued to grow over the years to reach 130,700 in 2017. Tale 2 shows the percentage distribution of Palestinian labors by the place of work.

Table 2: Percentage Distribution of Employed Persons Aged 15 Years and Above from Palestine by Place of Work for the Years 2000 to 2017 (Values in Percentages)

Years	West Bank	Gaza Strip	Israel and Settlements
2000	56.4	24.8	18.8
2001	62.1	25.4	12.5
2002	63.2	27.5	9.3
2003	61.3	30.3	8.7
2004	64.2	27.8	8.0
2005	61.8	28.9	9.3
2006	64.9	26.5	8.6
2007	62.0	29.1	8.9
2008	63.1	27.0	9.9
2009	63.1	26.8	10.1
2010	63.0	26.6	10.4
2011	60.4	29.8	9.8
2012	59.8	30.7	9.5
2013	57.8	31.1	11.1
2014	60.4	28.0	11.6
2015	58.8	29.7	11.5
2016	57.7	30.5	11.8
2017	57.6	29.4	13.0

Source: Palestinian Central Bureau of Statistics (2018). Website: www.pcbs.gov.ps.

Looking at the above two tables, we notice that there is an increase in the number of Palestinians working in Israel and the settlements over time. Thus the growing dependency of the Israeli economy on the Palestinian labor might be viewed as good sign, i.e. it gives Palestinians a greater bargaining power.

Table 3, shows a more detailed percentage distribution of the Palestinians working in Israeli and the settlements by occupation.

Table 3: Percentage Distribution of Employed Persons Aged 15 Years and Above Who Work in Israel and Settlements from Palestine by Occupation from the Years 2000 to 2017 (Values in percentages)

Years	Legislators Seniors Officials & Managers	Professionals, Technicians, Associates and Clerks	Service and Sales Workers	Skilled Agricultural & Fishery Workers	Elementary Occupations	Craft and Related Trade Workers	Plant & Machine Operators & Assemblers
2000	0.4	2.8	5.6	3.0	44.0	38.3	5.9
2001	1.2	3.8	6.8	1.3	42.3	38.5	6.1
2002	1.2	3.7	7.5	0.5	39.9	38.5	8.7
2003	0.9	3.5	7.0	0.6	34.7	44.0	9.3
2004	0.7	4.6	6.7	1.1	38.9	37.8	10.2
2005	0.9	3.6	6.1	0.8	38.3	38.7	11.6
2006	0.5	4.4	6.3	0.6	40	37.2	10.8
2007	1.1	3.8	6.4	1.2	40.2	36.9	10.4
2008	0.6	4.2	7.1	0.9	42.8	36.4	8.0
2009	0.7	2.2	7.5	0.8	45.1	34.4	9.3
2010	1.1	2.0	6.6	0.9	46.1	34.4	8.9
2011	1.2	2.0	5.7	0.9	45.4	35.1	9.7
2012	1.9	1.5	5.6	1.0	41.1	38.8	10.1
2013	1.2	1.0	5.1	0.9	38.0	44.2	9.6
2014	1.6	1.5	5.5	0.4	37.2	46.4	7.4
2015	1.5	1.5	5.5	1.0	37.9	45.9	6.7
2016	1.0	1.1	6.0	0.8	37.2	46.9	7.0
2017	2.0	2.3	6.3	0.7	35.9	45.2	7.6

Source: Palestinian Central Bureau of Statistics (2018), Labor Force Survey. Website: www.pcbs.gov.ps

We notice that the largest percentage of Palestinians is working in the Craft and Related Trade Workers 45.2%, followed by Elementary Occupations with 35.9 in 2017.

Now let us take a closer look at the percentage of distribution of Palestinian labor force working employed in the Palestinian economy. The table below shows the percentage distribution of Palestinian labor among economic activities.

Table 4: Percentage Distribution of Employed Persons Aged 15 Years and Above from Palestine by Economic Activity for the Year 2018 (Values in Percentages)

Economic Activity	Percentage of Workers
Agriculture	6.4
Industry	13.1

Construction	17.7
Hotels, Restaurants, and Commerce	21.7
Transportation, storage and communication	6.2
Services and other branches	35.1

Source: Palestinian Central Bureau of Statistics (2018), Labor Force Survey. Website: www.pcbs.gov.ps

Table 4, shows that the services and other branches of the Palestinian economy employ the largest percentage of labor with 35.1 percent. Meanwhile, the transportation, storage and communication sector recorded the lowest percentage with a 6.2 percent.

3. Literature Review

There have been numerous studies that examined the relationship between economic growth and unemployment. Kreishan (2011) examined the relationship between economic growth and unemployment in Jordan using Okin's Law. Time series analysis was utilized on the annual data covering the time period from 1970 to 2008. The results had indicated that Okin's Law does not apply for Jordan, i.e. the lack of economic growth does not explain the unemployment problem in Jordan. So policies that deal with the restructuring and reforms in the labor market would be more appropriate for policy makers to implement in order to reduce unemployment in Jordan.

Akeju and Olamipekun (2014) examined the validity of Okin's Law in Nigeria. The Error Correction Model and Johansen Cointegration method were both used to test the short and long run relationship between unemployment and economic growth in Nigeria. The study had found that there is both a short and long run relationship between unemployment rate and output growth in Nigeria. Based on these results a number of fiscal policies were suggested.

Samarah (2017) looked at the relationship between unemployment and GDP per capita among other macroeconomic variables for the Palestinian economy. The Palestinian economy was studied using the GDP per capita, unemployment, inflation and percentage of Palestinians having a Bachelors Degree or above. The Least Squares regression model was utilized. The results had indicated that unemployment had a negative impact on the GDP per capita, and education had a positive effect on the GDP per capita. Finally, inflation was not significant

An additional important source of employment for the Palestinian labor force is the Israeli economy. The Israeli economy absorbs a considerable percentage of the Palestinian labor force, which led to the contribution of the Palestinian labors to the productivity of the Israeli economy. Thus a dependency relationship –if allowed to evolve– is manifesting. Israeli is better off using Palestinian labor to meet its labor shortages (Samarah & Rahman, 2017).

Now, let us take a look at some of the literature discussing the COVID-19 epidemic.

Yezli and Khan (2020) discussed the measures that were taken in the Kingdom of Saudi Arabia despite of the socio-economic, political, and religious challenges. The study indicated that the results of these policies are yet to be seen. Nevertheless, the study

predicted that further strict and bold measures will be required to be implemented in the kingdom in the near future.

Chudik, Pesaran, and Rebucci (2020) applied a modification of the standard Susceptible-Infected Recovery (SIR) model to allow for the different degree of mandatory and voluntary social distancing. The implications of social distancing were both spread of the epidemic and economic losses were considered and their trade off were stimulated under different social distancing and economic participation serious, the study had showed that mandating social distancing is very effective in flattening the epidemic curve but it is costly in terms of the increases in unemployment. Nonetheless, if the policies are targeting the individuals that are most likely to spread the epidemic the rise in the unemployment rate will be, minimized. The paper also shows that voluntary self-isolation driven by individual's works only towards the peak of the epidemic and has either little or no impact on flattening the curve. The available data was used to estimate both the exposure and recovery rates of selected countries and Chinese provinces.

In this paper we will first determine the cause and effect relationship between economic growth and unemployment. Then we will use our estimate model –based on Okin's Law- to calculate the effect of COVID-19 on the economic growth in Palestine.

4. Methodology

We will start our analysis by looking at the standard version of Okin's Law is given by the equation below

$$y_t = \beta_0 + \beta_1 u + e$$

Where y is the real output product; u is the level of unemployment; β_1 is the parameter representing Okin's coefficient; e is the white-noise disturbance term.

The Okin's coefficient represents the changes in real output caused by the changes in the level of unemployment. Okin's Law remains an important theory in economics and is updated by researchers. The law states that a 1 percent increase in the growth rate above the growth trend would lead to a 0.3 percent reduction in the unemployment rate. Thus a 1 percent increase in the unemployment rate would lead to a roughly more than 3 percent loss in the GDP growth rate. This relationship asserts that the rate of the GDP growth must be equal to the potential growth rate in order to keep unemployment constant. Thus the growth rate of the GDP must be above that of the potential, growth rate of the output to reduce unemployment (Tatom, 1978).

Nonetheless, applied econometrics should not be limited to the task of an empirical exercise to either validating or refuting economic theories (Narayan & Mishra, 2011). This is why we will alter Okin's model to test the relationship between unemployment and economic growth. We will use the GDP per capita for economic growth and the unemployment rate to examine this relationship. Therefore, we have the following equation

$$y_t = \beta_0 + \beta_1 U + e$$

where Y represents GDP per capita; and U is unemployment rate. Since we are interested in the elasticities, we will look at the log of these variables.

$$\text{Log}(y_t) = \beta_0 + \beta_1 \text{Log}(U) + e$$

Here we will talk about elasticities, where a large value of Okin's coefficient will mean that a percentage change in unemployment rate will lead to a greater percentage change in GDP per capita.

We will use stochastic time series model. In such models the generating process is a combination of a starting value and a sequence of a purely random component (Greene, 1995, p. 559). Hence the value of y_t is dependent on both an initial value of y_0 and a purely random component of the history of $\varepsilon_1, \varepsilon_2$, (Greene, 1995, p. 415).

The concept of stationary guarantees the absence of fundamental fluctuations in the structure of the scholastic process. This property allows the possibility of the prediction of future values, i.e. this property makes it possible to predict future values. The Unit Root Test will be used to test the stationary of a variable.

The roots of the Autoregression polynomial are vital in determining whether a series is stationary or not. The modulus of the roots are calculated by $\lambda = a \pm bi$. The modulus is equal to the $(a^2 + b^2)^{1/2}$. If λ is real, then $b = 0$ and the modulus is equal to the absolute value of a . The Unit Root Rule for stationarity states the following,

If the modulus of any roots of $\beta(L) \leq 1$ then the series is non-stationary. Thus for the series to be stationary all the roots of $\beta(L)$ should lie outside the unit root circle in the complex plane (Greene, 1995, p. 556).

To achieve this, (Hendry & Juselius, 2000) indicated that when the data is non-stationary purely due to the reason of a unit root (integrated once, $I(1)$), taking the first difference can bring it back to stationary. Thus here we are looking at the change that occurs from one period to the next, thus the quantity of $Y_t - Y_{t-1}$. When the first difference produces a stationary process we say that the series Y_t is integrated of order one, and represented by $I(1)$. That is, a series is integrated of order d and denoted by $I(d)$, i.e. the series becomes stationary after being differenced d times (Greene, 1995, p. 559).

The Augmented Dickey-Fuller Test will be used to test the null hypothesis there is a unit root in the first difference of the GDP per capita for Palestine. Then we will repeat the same test for the unemployment rate in Palestine. We will use the Johansen cointegration Test to determine whether there exists a long term relationship between the two variables. Then we will use the Granger causality Test will examine whether the unemployment Granger causes the GDP per capita. Finally the Dynamic Least Squares method (DOLS) will be used to test the nature of this relationship –either negative or positive. The DOLS includes past, present, and future values of the change. The model has the below equation

$$Y_t = \beta_0 + \theta X_t + \sum \delta_j \Delta X_{t-j} + \varepsilon_t$$

Where Y_t : Dependent variable, β_0 : Beta coefficient, X_t : Independent variable, θ : Coefficient

δ : coefficient, j : Index, ε_t : Error term (Stock and Watson, 2015)

5. Results

The unit root test was performed for the Palestinian unemployment rate (x) and the Palestinian GDP per Capita (Y) for the period from 1995 to 2018. The Eviews 10 software was used to run Augmented Dickey Fuller (ADF) test and the results are given below (Phillips-Perron unit root test results are qualitatively similar):

Table 5: Augmented Dickey Fuller (ADF) test results

Variable Name	Unit Root
Log Y	No Unit Root at 1 st difference
Log X	No Unit Root at 1 st difference

This shows that given the variables are stationary over time. Thus we can predict the next value.

After having the individual variables as unit root free, we test for possible long term relationships among variables using cointegration technique in the spirit of Johansen. Thus we will have the results in the table below.

Table 6: Bivariate Johansen Cointegration test results

Variables	Nos. of Cointegrating relationship
Log(dy), Log(dx)	2

The Pairwise Granger Causality Test was used to determine the direction of the causality relationship between the Log(Y) and ENTRE; unfortunately there was no causality between the variables as shown in the table below.

Table 7: Results of Granger Causality Tests

Variables	Causality (lag)	Causality (direction)
Log(dx) and Log(dY)	4	Yes
Log(dy) and Log(dx)	3	Yes
Log(dy) and Log(dx)	4	Yes

The Dynamic Least Squares method was performed, the constant had a p-value of 0.1694. Thus the constant is not significant using an alpha of 0.05. Meanwhile, the p-value for unemployment was 0.0484, hence unemployment is significant and we have the following model

$$\text{Log(dy)} = 0.356 \text{ Log(dx)}$$

The model has an R-squared of 0.64.

The model above will aid in evaluating the effect of COVID-19 on the economic growth in Palestine. We will use the data for 2018 to estimate the effect of this virus due to the lack of data for both 2019 and 2020. In the year 2018, the unemployment rate was 30.8 percent. So we carry out the following calculations:

$100 - 30.8 = 69.2$ percent

As a result of the spread of COVID-19, the industrial sector; construction sector; Hotels, Restaurants, and Commerce; Transportation, storage and communication; and other services were hit hard. The affected sectors make up 93.6 percent of the job opportunities provided for the Palestinian workers. Thus adding 64.8 percent of the workers to the rate of unemployment. So according to our model COVID-19 had a maximum impact of adding 64.8 percent to the rate of unemployment. According to our model this will decrease the Palestinian GDP per capita by 23.1 percent.

6. Conclusion

In this paper we looked at the Palestinian GDP per capita, and the unemployment rate in Palestine. We found that as the unemployment rate increases by 1 percent the GDP per capita decreases by 0.356 percent. Since the unemployment rate continues to rise in the Palestinian Territories, it is a clear indication that the creation of new jobs is not absorbing the increasing size of the labor force. Thus our results had come to back up Okin's postulate, where his results indicated that a 1 percent increase in the unemployment rate will cause a more than 0.3 percent loss in the economic growth. The estimated coefficient had made it possible to estimate the effect of COVID-19 on economic growth. We calculated the effect of COVID-19 on the Palestinian economy in the short run months of the quarantine –from March 7th to June 1st where most of the workers were at home. Nonetheless, this increase in the unemployment rate had clearly dropped after June 1st things resumed in approximately a normal fashion. Clearly, COVID-19 had contributed negative to economic growth in Palestine, but since the Palestinian economy is not an industrial economy competitiveness had more or less remained the same. The Palestinian economy is labor abundant and the human capital is the vital factor of production in such an economy.

The Palestinian economy is heavily dependent on the Israeli economy. The Palestinian government had failed to end the Israeli occupation and break away from its dependency on the Israeli economy. This is why when looking at the Palestinian economy; we should always take into account the Israeli economy. In spite Israel being both a digital and hi-tech economy, is employing the unskilled Palestinian labor. Thus the rising percentages of employment in Israel are not contributing to a decrease in unemployment rates among educated professionals. This is clearly shown in Table 3.

So the PA can use good governance in order to trigger economic growth in Palestine (Samarah W. A., 2018). This will aid in the creation of jobs and decreasing the level of unemployment. However, the challenges are far from over, the continuation of the Israeli occupation and the expansion of the settlements in the West Bank and Jerusalem limits the Palestinian government's role to a "crisis management" Israel is still in total control of Palestinian borders, exports inflation to the Palestinians due to the absence of a Palestinian local currency and significance employment of Palestinian labor in Israel. All these factors and others make Israel a foreign power that can tip the situation in the Palestinian territories and contribute dramatically to creation of a VUCA environment.

Thus in addition to the challenges that the all the Arab States face, the Palestinians had an additional challenge that they have to worry about the Israeli occupation.

The increasing number of settlements and the expansion of existing settlement in both Jerusalem and the West Bank are alarming. This is limiting the growth of both the Palestinian agricultural and industrial sectors. It is also re-shaping the expansion of Palestinian cities (Atrash, 2014; Samarah and Talalweh, 2019).

The Palestinian government should first and for most concentrate on ending the occupation in order for it to have an upper hand on the Palestinian economy. Then it should learn from the mistakes that other Arab States had made in order to avoid the VUCA environment. In the meantime, with its limited role as a crisis manager it can monitor the unemployment rate and make whatever is necessary in order to keep the unemployment under control.

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