

# The Impact of Labor Force on Economic Growth in Vietnam

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**Key words:** Economic growth, FDI, Labor force, annual inflation rate, Vietnam

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International Business Management Copy Right: Medwell Publications Abstract: The effectiveness of savings investment and labor force (including Foreign investment and aid) is central to promoting economic growth while other factors play a certain role in economic growth such as geographic location, natural features, natural resources, economic and political stability, educational and medical capacity, policy institution. The purpose of this study is to analyze the impact of labor force and several other factors on economic growth in Vietnam. The empirical model is employed to perform regression and correlation on the effect of labor force, Foreign direct investment, exports and inflation on Vietnam's economic growth by using a secondary time series data set during the period 1998-2018. The results find that both labor force and Foreign direct investment have a positive influence on economic growth at a 1% significance level while exports of goods and services has a positive impact on economic growth at a 10% significance level, annual inflation rate has a negative impact on economic growth at a 1% significance level. These findings are in line with economic theory and hold important policy implications for Vietnam.

#### INTRODUCTION

According to a most common view if there is an increase in the growth rate of Gross Domestic Product (GDP) or Gross National Product (GNP) or the size of national output Per Capita (PCI) between the following year and the previous year or between years in a certain period called economic growth. The achievement of economic growth shows the development potential and the strength trend of an economy, especially, for developing countries. High and sustainable economic growth is considered an achievement and a central theme in many economies both developed and developing countries<sup>[1]</sup>. GDP growth rate indicates the size of

economy in the future<sup>[2]</sup>. In fact, economic growth is an annual achievement of the government as an indicator to evaluate the efficiency of operating the economy by the people. In developed countries, although, the growth rate is low and stable every year but other socio-economic indicators are achieved. In contrast in many developing countries, pursuing economic growth may have to sacrifice other goals such as increasing the gap between rich and poor income inequality, development gap between rural and urban, wasteful use of resources, environmental pollution, others.

Most countries in the early stages of development, economic growth model is mainly based on raw materials products, meaning the exploitation of available natural resources and unskilled labor and Vietnam is not an exception. Over the past 30 years of economic innovations, Vietnam has been using an economic growth model that relies heavily on raw materials exports and Foreign direct investment by employing a cheap and unskilled labor force. Great achievements in socio-economic development have been achieved during this period. The economy has continuously maintained a fairly high growth rate from a country belonging to the group of the poorest countries in the world. Vietnam has become a developing country with an annual economic growth rate belonging to the group of the highest countries, escaped underdevelopment and became a low-middle-income country, GDP per capita in 2018 by 2,545.1 USD<sup>[3]</sup>. However, Vietnam's economic growth model based on raw products and unskilled labor is gradually becoming obsolete. The evidence is that after a number of times affected by the economic crisis and Covid-19 due to the impact of external and internal causes, economic growth is tending to slow down, low and unsustainable quality of growth, low competitive economy, Total Factor Productivity (TFP) still low, low labor productivity (labor productivity) compared to other countries in the region. According to PPP 2011, Vietnam's labor productivity in 2016 reached 9,894 USD, equal to only 7.0% of Singapore, 17.6% of Malaysia, 36.5% of Thailand, 42.3% of Indonesia and 56.7% of Philippines<sup>[4]</sup>. This researcher also predicted that the gap on labor productivity between Vietnam and other countries continues to increase. Based on Vietnam Productivity Report 2014<sup>[5]</sup>, the three factors affecting economic growth are capital, labor force and TFP in which capital with the highest growth rate was 11.67% in the period of 2006-2010 and 7.52% in the period of 2011-2014, labor force by 2.78 and 1.97%, TFP by -0.27 and 1.44%. The report also shows that the contribution of these three factors to economic growth in the period of 2006-2010 was respectively, 80% (capital), 25.8% (labor force), -5.8% (TFP). However, during the period of 2011-2014, there was a drastic change in the trend of reducing the proportion of capital's contribution and increasing the proportion of TFP's contribution to economic growth, TFP increased to 25.8%, labor force decreased to 23%. Thus, labor force is an important factor contributing a high rate to Vietnam's annual economic growth.

Literature reviews: The motivation of economic growth in both developed and developing countries includes four key factors: human resources, natural resources, capital and technology. The role of these four factors in coordination in each country is different and depends on each stage of development. In empirical researchs, the identification of a research model that includes independent variables may not be entirely these four

factors, the studies may be based on the reality of the study area to determine specific factors effecting economic growth.

A study on sources of economic growth in Zambia, the impact of these factors on economic growth was calculated in the short and long run<sup>[1]</sup>. In the short run, the relationship between economic growth and investment, human capital development is a positive sign while the effect of government consumption international trade and Foreign aid on economic growth has a negative sign. In the long run, the results show that the effect of investment and human capital development on economic growth has a positive sign while only Foreign aid has a negative impact on economic growth. A study on the relationship between inflation and economic growth with the title "When does inflation hurt economic growth? Different nonlinearities for different economies" [6], the results find that the impact of inflation on growth changes substantially as the inflation rate rises at the same time when inflation reaches 8% threshold is to begin a serious negative impact on growth in industrial countriesbut 3% or less in developing countries. This result reminds that the control of inflation rate must be very strict due to inflation easily hurts the economy of developing countries. The trade-off between inflation and economic growth needs to be flexible that is inflation as a driving force for economic growth. Kasidi and Mwakanemela<sup>[7]</sup> performed a regression on the impact of inflation on economic growth in Tanzania by using a time series data for the period 1990-2011. The results showed that the effect of inflation on economic growth was a negative sign. At the same time, the finds also revealed that during the period of study, there was no cointegration between inflation and economic growth, no long-run relationship between inflation and economic growth. Another study on the relationship between aid, exports and growth in Ghana was employed on a time series study of Ghana<sup>[8]</sup>. The results find that exports, aid and public investment has a positive effect on long-run growth. Morever in the pre-1983 period, the impact of exports and public investment on short-run growth was a negative sign while aid had no significant impact. In the post-1983 period, exports, aid and public investment had a positive effect on short-run growth via. policy reform. Ali and Hussain<sup>[9]</sup> employed on a time series data set during the period 1991-2015 by analyzing the impact of FDI on economic growth in Pakistan, the results find that the relationship between FDI and economic growth has a positive sign and significant. Bouchoucha and Ali<sup>[10]</sup> studied short-term and long-term relationship between FDI and economic growth in Tunisia via a times series data set during the period 1980-2015 by using the ARDL (Autoregressive Lag Distribution) approach, the results show that the impact of FDI on economic growth is a positive sign and significant in both the short-term and long-term.

Factors affecting economic growth in Vietnam have been studied by Vietnamese and other national researchers. The results of the calculation by decomposition addition in the period of 1996-2017 about the impact of labor force and capital on economic growth in Vietnam show that the size of labor force was positive, meaning that an increase in labor force in the industry contributed positively to the overall output of the economy<sup>[3]</sup>. Hoang et al. [11] studied the effects of FDI on economic growth in Vietnam by employing a panel data set during the period 1995-2006 of Vietnam's 61 provinces and the results showed that FDI had a positive impact and significant on economic growth. Ha et al.[12] built a regression model by using time series data set during the period 1990-2015 to analyze factors effecting economic growth in Vietnam. The finds showed that FDI, gross fixed capital formation, real exchange rate, real interest rate had a positive impact on economic growth. The research also showed that the relationship between inflation rate and economic growth was a negative sign. An empirical evidence on the relationship between tax burden and economic growth in Vietnam was employed on a time series data set in the period 2002-2011 by a simple linear model<sup>[13]</sup>. The finds showed that tax burden had a positive effect and significant on economic growth. The results by Nguyen etc. showed that in the period 2000-2016, the exporting activities of Vietnam had a positive impact on the ability to maintain the economic growth in the long run. Nguyen<sup>[14]</sup> studied the impact of FDI (net inflows) on economic growth in Vietnam by using linear approach via. a secondary time series data set during the period 1995-2018. The empirical results found that the effect of FDI (net inflows), export of goods and services (% of GDP), financial freedom index on economic growth (GDP at current prices) was a positive sign and significant. Moreover, the study also showed that investment freedom index and annual inflation rate had a negative effect on economic growth (GDP at current prices).

From the literature reviews above, factors effecting economic growth are human resources, natural resources, capital and technology. Based on the empirical studies in countries by different researchers, these factors are studied on the basis of each country's practices in different periods. Therefore, from the main factors are transformed into more specific factors such as investment, public investment, FDI, human capital, Foreign aid, international trade inflation, exports, labor force, gross fixed capital formation, real exchange rate, real interest rate, tax burden, financial freedom index investment freedom index, others. The purpose of this study is analyze the impact of labor force and several other factors on economic growth in Vietnam in the period 1998-2018.

#### MATERIALS AND METHODS

**Data and model:** An empirical study is used to determine the effect of labor force and several other factors on economic growth in Vietnam. Within the scope of this article, the researchers perform the regression and correlation by using a linear model. To accomplish the purpose of the study, a time series secondary data set ranging from 1998-2018 is employed by the authors and collected from relevant organizations such as The World Bank, General Statistics Office of Vietnam. Ordinary Least Squire (OLS) with multiple variables was used to assess the relation between dependent and independent variables. Data are analyzed, explained and presented by using descriptive statistics inferential statistics such as regression, correlation. The empirical results show that there is no any serious problem to conclude for the model mismatch. The following model is developed based on previous literature:

GDP = 
$$F(LF, FDI, INFL, EXP)$$
  
GDP =  $\beta_0 + \beta_1 LF + \beta_2 FDI + \beta_3 INFL + \beta_4 EXP + \epsilon_1$  (1)

Where:

GDP = Economic growth (Gross Domestic Product, current, Bill. US\$)

 $\beta_0$  = Intercept Term and  $\beta_1$ ,  $\beta_2$ ,  $\beta_3$ ,  $\beta_4$  are Coefficients

LF = Labor Force (million)

FDI = Foreign Direct Investment, net inflows (BoP, current, Bill.US\$)

INFL = Annual Inflation Rate (annual %)

EXP = Exports of goods and services (annual % growth)

 $\varepsilon$  = Error variable

With the given data this study perform a linear regression on the relationship between five independent variables (LF, FDI, INFL, EXP) and economic growth (GDP at current prices) in Vietnam to analyze the role of labor force and several other factors on economic growth in Vietnam at the same time to compare the effect degree between labor force and other factors on economic growth.

#### RESULTS AND DISCUSSION

**Descriptive statistics:** The descriptive statistics on the relationship between independent variables (labor force, FDI inflation, export) and economic growth (GDP at current prices) in Vietnam during the period 1998-2018 to be showed in Table 1.

The output data in Table 1 shows, average annual in the period of 1998-2018, mean of GDP reached 108.4916 billion USD but the annual inflation rate was 6.393905% which is suitable for a developing economy like Vietnam which belongs to the group of countries with highest economic growth. Mean of labor force was 49.05527

Table 1: Descriptive statistics

| Descriptive |             |           |           |           |           |  |
|-------------|-------------|-----------|-----------|-----------|-----------|--|
| statistics  | GDP         | LF        | FDI       | INFL      | EXP       |  |
| Mean        | 108.49160   | 49.055270 | 6.393905  | 6.538524  | 14.647330 |  |
| Maximum     | 244.94800   | 56.933420 | 15.500000 | 23.116000 | 25.620000 |  |
| Minimum     | 27.21000    | 39.835730 | 1.298000  | -1.710000 | -5.085000 |  |
| SD          | 72.69972    | 5.498166  | 4.745612  | 5.693810  | 6.322255  |  |
| Observation | ns 21.00000 | 21.000000 | 21.000000 | 21.000000 | 21.000000 |  |

Descriptive statistics output of data collected

Table 2: Correlation matrix between GDP and independent variables

| Pearson     |           |           |           |           |     |
|-------------|-----------|-----------|-----------|-----------|-----|
| correlation | INFL      | FDI       | LF        | EXP       | GDP |
| INFL        | 1         |           |           |           |     |
| FDI         | 0.125532  | 1         |           |           |     |
| LF          | 0.116435  | 0.930616  | 1         |           |     |
| EXP         | -0.209613 | -0.348549 | -0.376823 | 1         |     |
| GDP         | 0.010537  | 0.959562  | 0.967915  | -0.278772 | 1   |

Table 3: Regression Analysis Results for GDP and explanatory variables for the model (1)

| Variables      | Coefficient | SE            | t-statistic | Prob.    |
|----------------|-------------|---------------|-------------|----------|
| C              | -323.9466   | 56.30607      | -5.753315   | 0.0000   |
| LF             | 7.807724    | 1.285501      | 6.073684    | 0.0000   |
| FDI            | 6.897955    | 1.473024      | 4.682853    | 0.0002   |
| INFL           | -1.250516   | 0.459934      | -2.718903   | 0.0152   |
| EXP            | 0.921660    | 0.443651      | 2.077445    | 0.0542   |
| $\mathbb{R}^2$ | 0.980233    | F-statistic   |             | 198.3564 |
| Durbin-        | 1.482364    | Prob          |             | 0.000000 |
| watson stat    |             | (f-statistic) |             |          |

Correlation output of data collected

million workers, shows that about 55-60% of total population has become workers, meaning Vietnam's labor force is abundant and young, the amount of labor force was increased over time but growth rate between the following year and previous year was decreased (for example, 2.55% in 1998, 0.94% in 2018) and tends to population aging. Evidence that the Vietnamese government is encouraging people to get married before age 30 and give birth early. Minimum of inflation rate was -1.71% in 2000 by using a tight monetary and fiscal policy due to the impact of the Asian financial crisis during the period 1997-1999 and maximum of inflation rate was 23.116% in 2008 due to the impact of the 2008 financial crisis.

## Correlation and regression analysis

Correlation and regression analysis between GDP and independent variables: In Table 2 and 3, the correlation analysis was undertaken between GDP at current prices and explanatory variables such as labor force, FDI inflation, export. The impact of factors on GDP at current prices could be a positive or negative sign.

The correlation output shows that there is a positive correlation between GDP and labor force, FDI, export while the correlation between GDP and inflation is a negative sign (Fig. 1).

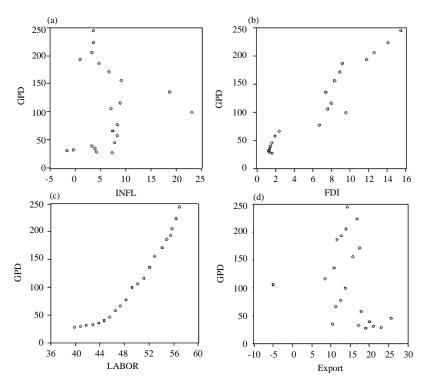


Fig. 1(a-d): Durbin-Watson test

Table 4: Regression analysis Results for GDP and explanatory variables for the model (5)

| Variables          | Coefficient | SE            | t-statistic | Prob.    |
|--------------------|-------------|---------------|-------------|----------|
| C                  | -350.6418   | 52.60840      | -6.665129   | 0.0000   |
| LF-0.14*LF(-1)     | 9.748624    | 1.387358      | 7.026755    | 0.0000   |
| FDI-0.14*FDI(-1)   | 5.117241    | 1.473940      | 3.471810    | 0.0034   |
| INFL-0.14*INFL(-1) | -1.186065   | 0.400142      | -2.964107   | 0.0097   |
| EXP-0.14*EXP(-1)   | 0.774884    | 0.381722      | 2.029970    | 0.0605   |
| $\mathbb{R}^2$     | 0.981478    | F-statistic   |             | 198.7162 |
| Durbin-watson stat | 1.859883    | Prob          |             | 0.000000 |
|                    |             | (f-statistic) |             |          |

Correlation output of data collected

The value of Durbin-Watson test is  $1.482364 < d_u = 1.812$ , means that the Model (1) has an auto-correlation phenomena Grade 1. The author uses the general differential equation to remedy this violation. Therefore, we need to test autocorrelation phenomena based on the consideration of the remainder etdepends on its latency or not:

$$\begin{split} & GDP_{t}\text{-}\hat{\rho}GDP_{t-1} = \hat{\beta}_{0}\left(1\text{-}\hat{\rho}\right) + \hat{\beta}_{1}\left(LF_{t}\text{-}\hat{\rho}LF_{t-1}\right) + \\ & \hat{\beta}_{2}\left(FDI_{t}\text{-}\hat{\rho}FDI_{t-1}\right) + \hat{\beta}_{3}\left(INFL_{t}\text{-}\hat{\rho}INFL_{t-1}\right) + \\ & \hat{\beta}_{4}\left(EXP_{t}\text{-}\hat{\rho}EXP_{t-1}\right) + \left((\mu_{t}\text{-}\hat{\rho}\mu_{t-1}\right) \end{split} \tag{2}$$

The autocorrelation test with the extra regression. Model has not block coefficient. Model has not block coefficient:

$$\varepsilon_{t} = \alpha_{1} \varepsilon_{t-1} + \upsilon_{t} \tag{3}$$

Model has block coefficient:

$$\varepsilon_{t} = \alpha_{0} + \alpha \varepsilon_{t-1} + \upsilon_{t} \tag{4}$$

- The results of Equation (3): E (-1) = 0.148558, Durbin-Watson stat = 2.057899
- The results of Equation (4): E (-1) = 0.144455, Durbin-Watson stat = 2.072305

Through the DW statistics and the extra regression of Eq. 3 and 4, the correlation coefficient estimation grade 1 by  $\hat{\rho} \approx 0.14$  to substitute into Eq. 2:

$$\begin{split} & \text{GDP}_{t}\text{-}0.14\text{GDP}_{t-1} = \hat{\beta}_{0}\left(1\text{-}0.14\right) + \hat{\beta}_{1}\left(LF_{t}\text{-}0.14LF_{t-1}\right) + \\ & \hat{\beta}_{2}\left(\text{FDI}_{t}\text{-}0.14\text{FDI}_{t-1}\right) + \hat{\beta}_{3}\left(\text{INFL}_{t}\text{-}\hat{\rho}\text{INFL}_{t-1}\right) + \\ & \hat{\beta}_{4}\left(\text{EXP}_{t}\text{-}0.14\text{EXP}_{t-1}\right) + \left(\mu_{t}\text{-}0.14\mu_{t-1}\right) \end{split} \tag{5}$$

**Model fitness:** In Table 4, the regression results indicate that the model is consistent and statistically significant at a 1% significance level (Prob (f-statistic) = 0.000000). There is a significant positive effect between GDP at current prices and labor force, FDI, exports at 1%

significance level. Besides, there is a negative effect between GDP at current prices and inflation at 10% significance level. Further,  $R^2 = 0.981478$ , the explanatory level of the determinants of GDP at current prices in terms of R<sup>2</sup> by 98.1478%. This means that around 98.14% of variation in GDP at current prices is explained by this model vialabor force, FDI, exports and inflation. The value d of Durbin-Watson test by d = 1.859883 while at 5% level significance ( $\alpha = 5\% = 0.05$ ), sample numbers n = 21 independent variables in the model k' = 4 inferred  $d_L$  = 0.927 and  $d_U$  = 1.812. Due to  $d_n = 1.812 < d = 1.859883 < 4 - d_n = 2.140117$ , means that the model has not an autocorrelation phenomena Grade 1. The following is an analysis of the regression results to show the importance of each factor (labor force, FDI, exports inflation) on Vietnam's economic growth during the period 1998-2018.

Labor force: The economic theory and practice in developed and developing countries have confirmed that the relationship between the labor force and economic growth is a positive sign but in constant conditions of other factors an increase in labor force results in a gradual reduction in the marginal benefit of economic growth in the long run. In Vietnam, although the growth rates of labor force have been decreased during 1998-2018 but the number of labor force has been increased over the years, for example from 39.835733 million in 1998 to 48.232146 million in 2007 and 56.933418 million in 2018, the growth rate from 2.55% in 1998 to 1.9% in 2007 and 0.09% in 2018. Similarly,  $\hat{\beta}_1 = 7.807724$  in the Model (1) shows that in constant conditions of other factors, labor force increases to 1 million people, GDP at current prices increases to 7.807724 billion USD. Thus, from the descriptive statistical analysis and the regression results in Table 4, the increase of labor force has a positive and significant effect on economic growth. This result is consistent with the findings by Chirwa and Odhiambo<sup>[1]</sup> and Dong and Binh<sup>[3]</sup>.

Foreign direct investment: Both developed and developing countries are always attracted by FDI inflows, the competition of countries in attracting FDI is always fierce through preferential policies, favorable business and investment environment. FDI inflows not only contributes to economic growth but also contributes to the increase in exports, employment income, technology transfer, state budget, healthy competitive environment, others. In economic theory and practice in countries shows that the positive impact of FDI on economic growth is in both short and long run. In Vietnam, the Government's policies always has a special priority for FDI inflows when domestic capital is insufficient to meet the socio-economic goals of each year or each period.

Therefore, FDI inflows from other countries have increased over the years for example, FDI (net inflows, BoP, current, Bill.US\$) from 1.67 in 1998 to 15.5 in 2018. The regression results show that the relationship between FDI and GDP is a positive sign and significant on at a 1% level of significance. Similarly,  $\hat{\beta}_2 = 6.897955$  in the Model (1) shows that in constant conditions of other factors, FDI (net inflows, BoP, current) increases to 1 billion USD, GDP at current prices increases to 6.897955 billion USD. This result is consistent with the finding by Ali and Hussain<sup>[9]</sup>, Bouchoucha and Ali<sup>[10]</sup>, Hoang *et al.*<sup>[11]</sup>, Ha *et al.*<sup>[12]</sup> and Nguyen<sup>[14]</sup>.

Exports of goods and services: For each economy, exports contribute to the process of economic restructuring and promote the development of production, especially, help underdeveloped and developing countries to shift the economic structure from agriculture to industry in line with the development trend of the world economy. Moreover, exports are the main activity that creates a premise for imports, determining the size and growth of imports. Thus, exports distribute positively to improving the macroeconomic indicators including economic growth rates over the years. In economic theory as well as empirical evidence shows that exports and economic growth have a positive effect. In Vietnam, export activities are always promoted to develop domestic production of goods and services considered Vietnam's comparative advantage. Besides in order to enhance export activities, Vietnam always has preferential policies to attract FDI inflows. Evidence that the annual growth rate of exports for goods and services was about 14.65% during the period 1998-2018. The regression results also show that the relationship between exports of goods and services (annual % growth) and GDP at current prices is a positive sign. Similarly,  $\hat{\beta}_3 = 0.921660$  in the Model (1) shows that in constant conditions of other factors, exports of goods and services increase to 1%, GDP at current prices increases to 0.921660 billion USD. This result is consistent with the finding by Lloyd et al. [8], Nguyen<sup>[14]</sup>.

Annual inflation rate: Inflation could be a driving force or obstacle to socio-economic development in both developed and developing countries. This menas that the relationship between inflation and economic growth could be a positive or negative sign depending on the short run or long run, threshold of each country's inflation rate. In Vietnam, the regression results find that the effect of annual inflation rate has a negative sign and significant on GDP at current prices at 5% significance level. Similarly,  $\hat{\beta}_4 = -1.250516$  in the Model (1) shows that in constant

conditions of other factors, annual inflation rate increases to 1%, GDP at current prices decreases to 1.250516 billion USD during the period 1998-2018. This result is consistent with the finding by Burdekin *et al.*<sup>[6]</sup>, Kasidi and Mwakanemela<sup>[7]</sup>, Ha *et al.*<sup>[12]</sup>, Nguyen<sup>[14]</sup>.

# **CONCLUSION**

The aim of this study is to analyze the impact of labor force and several other factors on economic growth in Vietnam during the period 1998-2018. The empirical results show that the role of labor force and FDI oneconomic growth is strongest at 1% level of significance while the effect of inflation on economic growth has a negative sign at 5% significance level and exports for goods and services on economic growth is a positive impact at 10% significance level. The researchers will propose several policy implications according on the findings of this study as follows. Firstly, as a developing country, the labor force is still an important factor affecting economic growth in Vietnam in the next period both highly qualified and unskilled workers. However, Vietnam is changing the economic growth model from exploiting resources and unskilled labor mainly to increasing intellectual content of products. Thus, to have labor force of sufficient quantity and high quality, Vietnam is being recommended to maintain a young population through appropriate population policies and quickly change the training model from imparting knowledge to increasing soft skills and professional development training. Secondly, Vietnam needs to quickly shift from attracting FDI based on natural resources and cheap labor to high-tech FDI projects in order to become an new motivation for economic growth in the next period through tax policies, land infrastructure development, high quality labor, others<sup>[14]</sup>. Thirdly, Vietnam continues to become a member of international organizations and seriously implements its signed commitments on trade and investment agreements, thereby expanding its export markets and thus, stimulating economic growth<sup>[14]</sup>. Fourthly, due to inflation has a negative impact on economic growth, Vietnam needs to strongly control annual inflation index in order to become a driving force for economic growth<sup>[14]</sup>.

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