Long-run Relationship of Economic Growth with Consumption, Unemployment Rates and Saving Rates in Developing Countries: A Case Study of Vietnam

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Abstract The Keynesian macroeconomic model implies that household expenditures and savings have significant long-run impacts on economic growth by affecting total expenditures. Therefore, policymakers should determine and apply appropriate policies to maintain these variables. For this purpose, the long-run relationship of economic growth with consumption, unemployment and saving rates in Vietnam is analyzed with the time data method using annual data for the period 1996-2017. Consumption appears to have the most impact on economic growth in accordance with the estimation results of a co-integration test from an autoregressive distributed lag model (ARDL model). In long run, an increase of 1% in consumption expenditures decreases economic growth by 0.41%. A 1% increase in saving rates increases economic growth by 0.0009%. While an increase of 1% in unemployment rates decreases economic growth by 0.043%. Our results demonstrate that there exists only long run relationship among economic growth, consumption, saving and unemployment rates for Vietnam, but not in short run.

Keywords: economic growth, consumption, saving, unemployment rates, long-run

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1. Introduction

According to Samuelson, fiscal policy is a government program that deals with the sale of goods and services, spending on transfer payments and taxes, taxes (see [13]). While according to David Begg: Fiscal policy is the government's use of taxes and public spending to regulate the economy's overall level of spending. In other words: fiscal policy is the government's decisions on spending and taxes (see [6]). Keynesian economists say that fiscal policy has a great effect in combating the economic cycle. They use the IS-LM model (see [13]) to prove that fiscal policy is effective by reducing tax rates during periods of narrowing and recession, helping to limit the decline in output by increasing headcount. Private sector, while the increase in tax rates during periods of hot growth helps to curb inflation rate by cutting consumption outside the state sector. The economics of Paul A. Samuelson (see [13]) also mentioned fiscal policy, in which Samuelson said that: from a macroeconomic perspective, government spending also affects the overall spending level of the economy as a whole has an impact on GDP, and taxes also affect the economy by reducing people's income and at the same time impacting on prices of goods and factors of production, therefore, influences behavior and incentives.

Keynes proposed a new way to analyze the economy completely different from classical theory. Keynes argued that low aggregate demand is due to low income and high unemployment. Keynes criticized classical theory because it assumed that only total supply - capital, labor and technology governs national income. According to Keynes, the equilibrium of the economy is achieved when the level of labor use is sufficient to ensure an effective aggregate demand, economic efficiency will be at its highest if there is a positive impact on the total bridge. Therefore, when the output has not reached the potential output, the state needs to impact and intervene in the economy to overcome the imbalance, in order to increase the employment rate, increase output, through increasing government spending or tax cuts. It is necessary to have a State role in economic regulation to deal with crisis and unemployment; the state should use that authority to tax and increase spending, thereby influencing the business cycle. Government spending is public investment, injecting more money into the economy to increase aggregate demand. In his theory, Keynes emphasizes fiscal policy, he argued that it is necessary to play the role of the state in economic regulation to combat crisis and unemployment, the state should use its powers to impact the economic cycle (see [11]).

As we can see that, fiscal policy is the government's decision on spending and taxes. Fiscal policy has always been aimed at achieving three basic goals: economic

growth; economic stability and fair distribution. Economic theory is often not clearly about the effect of nation spending on economic growth. However, the economists are consistent with an idea that, in some cases the cut down on the size of government spending possible promote economic growth, and in some other cases the increase in nation spending is conducive to economic growth. This paper will investigate this relationship in the case of Vietnam.

Another important aspects of economic growth is Savings - Investment – Consumption, which is a circular in a closed loop, if mobilized, the development of a relatively balanced development will create a thrust for the whole economy to operate and develop. To do so, there must be a solution to meet the goals: increase savings, invest effectively, and "smart" consumption. In order to maintain macroeconomic stability and sustainable economic growth, a reasonable balance between savings and investment of the economy is necessary. The more economical the public and private final consumption is, the greater the resources available to invest, the higher the chance of economic growth. However, the key issue is that investment must be effective, otherwise it will cause waste, less effective than spending that resources for final consumption. Saving is another factor will be discussed in this paper.

The last point of economic growth which will be considered in this paper is unemployment rate. Unemployment is a socio-economic phenomenon, influenced by many socio-economic factors, including factors that are both cause and result. On the contrary, unemployment affects the country's socio-economic development process. Therefore, it is necessary to analyze clearly the interaction between economic and social factors on unemployment and, conversely, the effects of unemployment on socio-economic development; limiting the effects on increasing unemployment.

This paper focuses on clarifying the long run effects of consumption, unemployment and saving rates on economic growth, as a scientific basis for government policies. The structure of the study is as follows. Section 2 discussed the literature review. Section 3 described the data, the research model, and methodology of this study. The empirical analysis is presented in section 4. Section 5 covers the conclusion.

2. Literature Review

There have been few previous studies examining the long run nexus of economic growth, consumption, unemployment and saving rates have been conducted in developing and developed countries all over the world, especially in a particular countries such as emerging market economies in Asia, including Vietnam. There exists different empirical results in the previous works consistent with the link among economic growth, consumption, unemployment and saving rates in various situations.

Using a standard overlapping generation framework modified to incorporate matching frictions in the labor market and a technology capable of yielding unbounded endogenous growth, the author in [7] showed that the cross-country bivariate correlation between unemployment and growth can be either positive or negative depending on the source of the differences in economic structures across countries. The authors also presented a two-sector variant of the model in which there was imperfect competition in consumption goods production. A reduction in the propensity to save leaded to an expansion in the market size for consumption goods, and an increase in employment. If entry costs into consumption goods production were sufficiently large this expansion in employment could be big enough to produce an increase in the total volume of saving - and therefore growth - even though the propensity to save had decreased.

By analyzing a surveys, the authors in [8] summarized theoretical and empirical knowledge on the determinants of equilibrium unemployment. It was viewed as the outcome of the interaction between wage-setting and price-setting behavior. The evidence suggested that generous unemployment insurance, product market regulations, high unionisation and uncoordinated bargaining at the sector level contribute to high unemployment. The relationship between long-term growth and unemployment was not really clear. A higher growth rate can have both positive and negative unemployment effects.

With the same direction as this paper on long-run relationship concerning economic growth, the authors in [15] introduced an efficiency-wage model of steady-state equilibrium with labor-augmenting technical progress to explore the long-run relationship between unemployment and growth. The rate of productivity growth is either specified exogenously or determined endogenously. In both cases, the key results of the Shapiro-Stiglitz efficiency-wage analysis without growth were preserved. The model, however, also yielded some striking new results. For instance, an exogenous increase in the growth rate might raise the rate of efficiency-wage unemployment, and a once-for-all rise in the labor force might reduce the unemployment rate in the endogenous-growth case.

A discussion on the effect of unemployment on consumption, it was reported on an experiment that investigates the apparently robust phenomenon of over-sensitivity of consumption to current income. Using a particularly simple formulation, the authors also investigated whether individuals correctly respond to their employment status. It was found that subjects over-react. The data was useful to investigate where this over-sensitivity originates; it was concluded that economic agents differed in their ability to plan ahead and understand the dynamic process determining their employment status. However, agents seemed able to respond appropriately to changes in the parameters governing their decision processes, in that the comparative static predictions of the theory were largely confirmed (see [9]).

Continuing on discussion about economic growth, an overlapping generation model that highlights interactions between social security, unemployment and growth was developed. The social security system had two components: old age pensions and unemployment insurance. Pensions had a direct effect on economic growth. Both pensions and unemployment benefits influence equilibrium unemployment caused by wage

bargaining. Since unemployment deteriorated growth, both types of social security had an indirect negative effect on growth (see [12]).

Followed by the authors in [3] applied the vector auto-regression technique of variance decomposition and impulse response function analysis to investigate various interrelationships among foreign direct investment, exports, unemployment and gross domestic product in the case of Turkey over the period Jan 2000 to Apr 2007. The authors found that there were two co-integrating vectors in the system, indicating there was a long run relationship. The authors' findings showed that foreign direct investment did not have any contribution to reduce the unemployment rate in Turkey. Variations in exports had a positive impact on gross domestic product but they were insignificant. Moreover, variation in gross domestic product did not reduce the unemployment rate.

In another point of view, the author in [16] examined the long-run effects of domestic saving on income and tests the null of non-causality between saving and growth in India. The optimal single-equation and the maximum-likelihood system estimates of the model consistently supported the predictions of the neoclassical exogenous and the post-neoclassical endogenous models of economic growth, and suggested the significant long-run effects of saving on income. The innovation accounting showed the bidirectional causality between saving and growth. The stylized evidence for the steady-state effects of saving on income suggested the need to accelerate domestic saving to finance capital accumulation and foster higher income and growth. Most of the saving came from the surplus household sector, and the deficit private corporate and public sectors drew on household saving to meet their investment requirements and finance the resource gaps. A two-pronged approach with the incentive-based measures to induce the motivation to save and the productivity-based measures to increase income and strengthen the capacity to save, would be useful to generate higher saving and reinforce the acceleration of income and growth.

Agbloyor et al. conducted on examining the relation between private capital flows and economic growth in Africa during the period 1990–2007 (see [1]). The authors estimated the empirical relation with a panel data. Decomposing private capital flows into its component parts, the authors found that foreign direct investment, foreign equity portfolio investment and private debt flows all had a negative impact on economic growth. Countries with strong domestic financial markets, however, benefit more by being able to transform the negative impact of private capital flows into a positive one. Private capital flows, thus, promoted economic growth in the presence of strong domestic financial markets. These empirical results suggested that strong financial markets were needed for private capital flows to impact economic growth positively. The results of the paper were robust to the control of population size, savings, financial openness and institutional quality.

Another study on unemployment and economic growth in Nigeria, Akeju and Olanipekun showed that rapid population growth was together with low level of employment rate (see [2]). The theoretical proposition of the Okun's law was that a negative relationship existed between unemployment rate and economic growth. This study intended to test the validity of Okun's law in Nigeria. In order to examine the relationship between unemployment rate and economic growth, Error Correction Model and Johasen co-integration test were employed to determine both the short run and long run relationships among the variables employed in the study. Empirical findings showed that there were both the short and the long run relationship between unemployment rate and output growth in Nigeria.

Thanks to Tang & Tan in [17], it was aimed to study the relationship between savings and economic growth in Pakistan over the period 1971–2011. The co-integration and the Granger causality tests were adopted to examine the relationship between the variables. The results confirmed the existence of long-run equilibrium among the variables of interest. Meanwhile, savings had positively effect on economic growth in both the short run and long run. The Granger results also showed that savings Granger-cause economic growth. Based upon these findings, the authors confirmed that savings was a catalyst of growth for the Pakistani economy. Additionally, the results seemed more likely to support the capital fundamentalists because the long run estimation as well as the Granger causality results also indicated that savings growth could effectively spur economic growth in Pakistan.

In a similar topic, with a research on the answer to the problem of whether foreign direct and portfolio investments affected economic growth in long run in Central and Eastern Europe, Albulescu contributed to the literature interesting empirical results with a panel framework. The analyzed time-span was 2005-2012 and the sample includes 13 countries, namely Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, the Slovak Republic and Slovenia (see [4]). The author found that both direct and portfolio investments exert an influence on the long-term economic growth, when the author considered equity and investment funds instruments. The results showed that incentive packages should be oriented toward both types of investments. The findings were documented both in the case of inwards and outwards investments.

Most recently, Alper in [5] investigated the relationship among economic growth, consumption, investment, unemployment, portfolio investments and saving rates in Brazil, Russia, India, South Africa and Turkey with panel data method using annual data for the period 2005-2016. The author found that the savings rates have the greatest impact on economic growth. A 1% increase in saving rates increased economic growth by 0.50%. Consumption expenditures followed the saving rates. An increase of 1% in consumption expenditures increased economic growth by 0.41%. While a 1% increase in investment expenditures raised economic growth by 0.25%, the impact of the increase in portfolio investments on economic growth was positive but insignificant. An increase in unemployment rates negatively affected economic growth in compliance with the theory.

As we can see that, the long run effects of consumption, unemployment and saving rates on economic growth has been involved in some studies, but rarely the situation of

Vietnam has been considered. For a new situation of Vietnam, with a timeliness and novelty, the author execute the study on this topic to fill the gap in empirical study.

3. Data and Methodology

3.1. Data

The study attempts to examine the nexus among economic growth, consumption, saving and unemployment rates with an evidence from Vietnam by employing a time series data spanning from 1996 to 2017 using the Autoregressive Distributed Lag (ARDL) Model. Studied variables were employed from the database of World Bank (https://data.worldbank.org/) which will be denoted by GDP_GROWTH, CONS, SAVING and UNEMP.

3.2. Research Model

Long run relationship among economic growth, consumption, saving and unemployment rates has been investigated in some empirical studies in the world. In this study, we will investigate time series thanks to ARDL model. This model was proposed by Pesaran, Shin & Smith in [14].

The mathematical form of the ARDL model used in the article is as follows:

$$
\begin{aligned}
D(GDP\_growth)_t \\
= \alpha_0 + \sum_{i=1}^{m} \alpha_i D\left(GDP\_growth\right)_{t-i} + \\
+ \sum_{i=1}^{n} \beta_i D\left(cons\right)_{t-i} + \sum_{i=1}^{n} \gamma_i D\left(saving\right)_{t-i} + \\
+ \sum_{i=1}^{n} \delta_i D\left(unemp\right)_{t-i} + u_t,
\end{aligned}
\tag{3.1}
$$

where D is the difference operator; $\alpha_i, \beta_i, \gamma_i, \delta_i$ are the

regression coefficients, and u_t is the residual which has a simultaneous correlation but no correlation with its lags and all independent variables. So the right side of the regression equation consists of the lags of independent and dependent variables. Details of the ARDL model can be found in Chapter 17 of [10].

4. Results of Economic Modeling

4.1. Descriptive Statistics

Table 1 presents data description including 22 observations of each variable of Vietnam over a 22-year period from 1996 to 2017.

4.2. Test of Stationary

The test we used in the study is that the analysis needs to check the station of time series. We transform time series which are non-stationary to station ones. It means that after being transformed, times series have expectation, variance and covariance is constant over time. The time series in ARDL model must be stationary. Station character is an important concept when studying time series. However, in fact, most financial data series are non-stationary. To test the station, we use unit root tests, thanks to a common test Augmented Dicky-Fuller test (ADF test) and Phillips-Perron test. We use the unit root test with the order of lag is automatically selected according to Schwarz criterion, with no intercept and no trend is included in test equation for every variables. ADF tests for the initial time series, and their first difference will be performed. Usually, after taking the first difference, we get the stationary time series. The use of the first difference of time series is not only to obtain stationary time series, but also the first difference series provide information about increasing or decreasing trend (depending on the sign of the difference) rather than focusing on providing information about the real value of the time series.

Table 1. Descriptive Statistics

	DGP_GROWTH	CONS	SAVING	UNEMP
Mean	6.522719	73.85876	21.56277	1.942545
Median	6.372030	72.72660	19.89056	2.073000
Maximum	9.340017	82.79456	33.01664	2.870000
Minimum	4.773587	70.42613	7.860828	0.999000
Std. Dev.	1.039024	3.198492	7.054094	0.526483
Skewness	0.769532	1.318086	0.257434	-0.401332
Kurtosis	3.787483	4.159918	2.356547	2.408261
Jarque-Bera	2.739778	7.603582	0.622527	0.911556
Probability	0.254135	0.022331	0.732521	0.633955
Sum	143.4998	1624.893	474.3809	42.73600
Sum Sq. Dev.	22.67097	214.8374	1044.965	5.820867
Observations	22	22	22	22

Table 2. ADF Stationarity test results of the time series at 5% significance

Variable	Augmented Dicky-Fuller test		Phillips-Perron		Conclusion
	Stat. value	Cor. Prob.	Stat. value	Cor. Prob.	
GDP_growth	-1.040213	0.2589	-1.06343	0.2502	Non-stationary
D(GDP_growth)	- 4.059626	0.0003	- 5.1203	0.0000	Stationary
Cons	-1.125070	0.2281	-0.93210	0.3014	Non-stationary
D(Cons)	-3.112109	0.0036	-3.04180	0.0043	Stationary
Saving	-0.619413	0.4369	-0.61119	0.4405	Non-stationary
D(Saving)	-4.679693	0.0001	-4.67955	0.0001	Stationary
Unemp	-0.464942	0.5016	-0.46494	0.5016	Non-stationary
D(Unemp)	-6,680826	0.0000	-6.47599	0.0000	Stationary

Note: Stat.: Statistical, Cor. Prob.: Corresponding probability.

The results in Table 2 shows that all time series are non-station at level, but their corresponding first difference level series are station at a significance level of 5%. So that, we can put all first different level series in to ARDL model for investigation.

4.3. Discussion of Estimation Models

First of all, Hannan-Quin information criterion value is used to choose the most appropriate model. The traditional way to select the optimal lag is to estimate the ARDL model multiple times with descending lags to 0. Among the estimated ARDL models, we choose the one with smallest Hannan-Quin information criterion value. In this article, the authors try out up to the top three lags and selects the recommended model according to Hannan-Quin criterion. The image depicting Hannan-Quin's criterion value for the twenty best models, including the best model. Thanks to this Hannan-Quin information criterion, the best ARDL selected is that ARDL(1,3,3,0).
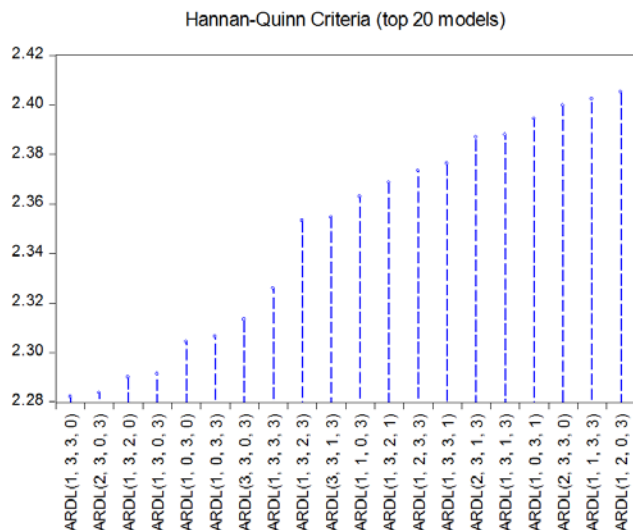

Figure 1. Hann-Quin's Criteria for the twenty Best Models

4.4. Results of Econometric Modeling

ARDL(1,3,3,0) is estimated as in the following Table 3.
Unfortunately, the corresponding probability in which we test the significance of each estimated coefficient are not ideal. They are all larger than 0.05. Therefore, at 5% significant level, it can be said that it is not appropriate to discuss about the short run relationship among economic growth, consumption, saving and unemployment rates.

Table 3. Results of ARDL(1,3,3,0) model estimation with dependence variable of GDP_growth

Variable	Coefficient	Std. Error	t-Statistic	Probability
D(DGP_GROWTH(-1))	0.033698	0.298415	0.112925	0.9133
D(CONS)	-0.170094	0.159839	-1.064156	0.3226
D(CONS(-1))	-0.015456	0.147267	-0.104950	0.9194
D(CONS(-2))	0.074272	0.163332	0.454731	0.6631
D(CONS(-3))	-0.286868	0.173805	-1.650522	0.1428
D(SAVING)	0.084208	0.046880	1.796234	0.1155
D(SAVING(-1))	-0.020670	0.064357	-0.321175	0.7575
D(SAVING(-2))	-0.105971	0.070142	-1.510799	0.1746
D(SAVING(-3))	0.043290	0.044673	0.969025	0.3648
D(UNEMP)	-0.041508	0.701806	-0.059145	0.9545
C	-0.038358	0.240437	-0.159536	0.8778

To go further to investigate the long-run relationship among the above considered variables, we use cointegration test thanks to Bound test.

Table 4. Test of long-run relationship between the variables

Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	k
F-statistic	6.277102	3
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89
1%	4.29	5.61

According to Table 4, the test statistic value is larger than every critical Value Bounds at every significance levels. Therefore, there exists a long run relationship between tariff and economic growth. That long-run from is presented in Table 5.

Table 5. Long-run relationship between the variables

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CONS, 2)	-0.170094	0.159839	-1.064156	0.3226
D(CONS(-1), 2)	-0.074272	0.163332	-0.454731	0.6631
D(CONS(-2), 2)	0.286868	0.173805	1.650522	0.1428
D(SAVING, 2)	0.084208	0.046880	1.796234	0.1155
D(SAVING(-1), 2)	0.105971	0.070142	1.510799	0.1746
D(SAVING(-2), 2)	-0.043290	0.044673	-0.969025	0.3648
D(UNEMP, 2)	-0.041508	0.701806	-0.059145	0.9545
CointEq(-1)	-0.966302	0.298415	-3.238110	0.0143
Cointeq = D(DGP_GROWTH) - (- 0.4120*D(CONS) + 0.0009*D(SAVING) -0.0430*D(UNEMP) - 0.0397)				

In the co-integration test, the co-integration regression coefficient is negative (- 0.966302) and is statistically significant at 5% (with a small probability value of 0.0143) indicating that co-integration relationship exists between variables. That is, in the long term when the system is in equilibrium, when a shock occurs, the variables in the model tend to move, "pull" the whole system "back" to the equilibrium, which means a reverse movement tendency (the negative sign of the co-integration regression coefficients) compared to those fluctuations. The co-integration equation, or equation that represents the long-run equilibrium relationship among the variables is as follows:

$$D(GDP\_growth)_t = -0.412 * D(cons)_t +$$
$$+0.0009 * D(saving)_t - 0.043 * D(unemp)_t \quad (4.1)$$
$$-0.0397 + u_t.$$

5. Conclusion

According to Figure 1, the estimation of the ARDL (1,3,3,0) is finally selected as the best model to study. Unfortunately, the short run relationship among economic growth, consumption, saving and unemployment rates does not exist. Therefore, this estimated model is just a medial step to exceed the long run analysis.

Regarding the long-run equilibrium relationship among the variables is as in equation (4.1), in which, a 1 percent of final consumption expenditure in GDP will decrease the economic growth by 0.412 percent. A 1 percent of net national savings in GNI will increase the economic growth by 0.0009 percent. And a 1 percent of unemployment in total labor force will decrease the economic growth by 0.043 percent. This empirical results are consistent with classical economic theory. For the situation of Vietnam, to strengthen the role of fiscal policy in stabilizing economic cycles, Vietnamese government should coordinate a range of solutions, including developing a reasonable medium-term spending plan, ensuring fiscal discipline, security, financial safety, effective mechanism of fiscal policy management, tax system improvement to increase stable revenue, restructure public investment to improve the efficiency of using budget capital, and manage fiscal policy aims to have more timely and effective policies, in coordination with fiscal policy to create a resonant rather than destructive effect to achieve the overall growth goal, as well as the trust commitment of business community and citizens to contribute to stabilizing the economic, political and social environment.

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