

# **Sustainability of Public Debt in Vietnam**

## **Abstract**

Public debt and its management have recently forcefully revived the academic and policymaker debate, especially after the Global Financial Crisis (2007-08). The public debt in Vietnam is still under a reasonable level, however, the significant increase in accumulated public debt in the post-global crisis raises concerns regarding sustainability of public debt in the long-term. In addition, Vietnam has attracted substantial foreign capital inflows including FDI in the last decade, but when Vietnam has become a middle-income country, the condition of external debt will be more difficult with higher borrowing cost. An increase in the lending interest rate may put pressure on repayment obligations of government. The high level of public debt in Vietnam was derived from larger fiscal deficit, particularly due to a sharp rise of recurrent expenditure and inefficient public investment projects undertaken by state owned enterprises in recent years. The objectives of this paper are to assess the current public debt situation in Vietnam and to provide some simulations on the public debt in the medium to long-term. The analysis is basically based on the data officially obtained and numerical simulations. The results show that tax reforms to increase the government revenue through more progressive tax system in the corporate income tax and personal income tax rate would contribute to increase in total government revenue and thereby reduce public debt in the future.

## **1. Introduction**

Public debt and its management have recently forcefully revived a debate among academics and policymakers, especially after the global economic crisis in late 2008. Although many studies have mentioned this issue, their results are still ambiguous. Woodford (1990) stated that a higher public debt, in so far as it implies a higher proportion of liquid assets in private sector wealth, increases the flexibility of the private sector in responding to variations in both income and spending opportunities, and so can increase economic efficiency. On the contrary, Krugman (1988) identified the “debt overhang” problem when the expected present value of potential future resource transfers is less than its debt. As the stock of public sector debt increases, the government’s debt service obligation will be financed by distorted measures (the inflation tax, for example), as in Agénor & Montiel (1996). Moreover, recent empirical studies suggest that a non-linear relationship between

public debt and economic growth should be described by inverted U-shaped curve with the certain turning point beyond which an increase in public debt has significant and negative impact on growth (Reinhart & Rogoff, 2010; Checherita & Rother, 2010; Cecchetti et al., 2011; Baum et al., 2013; Fincke & Greiner, 2014).<sup>1</sup>

Vietnam like many developing countries needs to borrow externally to implement various projects on infrastructural construction and socio-economic development. However, the consequences of the public debt crisis which happened in emerging countries during the 1980s and 1990s and recently in Europe are good lessons for Vietnam to be careful with its budgetary decisions. Specially, significant increase in accumulated public debt in Vietnam after the global financial crisis in 2007-08 raises concerns regarding sustainable growth in medium to long-term. In fact, Vietnam's total public debt increased from approximately 40% of GDP in 2007 to 56.3% of GDP in the end of 2010, slightly decreased to 54.9% of GDP in 2011 due to high inflation. Simultaneously, external debt of the nation increased from 32% to approximately 42% of GDP<sup>2</sup>. The Ministry of Finance projects that total outstanding public debt stock could peak at about 65 percent of GDP<sup>3</sup> which is public debt ceiling by the end of 2017.<sup>4</sup>

The high level of public debt in Vietnam was derived from structural factors of fiscal deficit, particularly due to a sharp rise of government expenditure in recent years. Vietnam is now attracting massive scale of FDI, so that larger fiscal spending is used for infrastructure investment during the stage of rapid development. However, the pace of expansion of the expenditure may not continue for a long period. Meanwhile, public administration has accounted for a large proportion of public expenditure and tends to move up in recent years. According to Ministry of Finance in Vietnam, this component has increased remarkably from 18 billion VND in 2010 to more than 44 billion VND in 2016. On the other hand, share of development investment expenditure is decreasing significantly, from level of over 30% of total public expenditure in 2008 to just over 15% in 2014 and 2015. This reflects the fact that the administrative reforms have yet to take effect, systems and mechanisms of recurrent spending had no positive improvements and in the coming years, the ability to rapidly reduce recurrent expenditure is not easy, cause significant impact on the budget deficit and public

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<sup>1</sup> Thao PHAM, "Impacts of public debt on economic growth in six ASEAN countries", expected in publication in *Ritsumeikan Annual Review of International Studies*, 2018.

<sup>2</sup>The Government's Report No. 305/BC-CP dated October 30th, 2012 on the situation of public debt.

<sup>3</sup>65 percent of GDP is public debt ceiling which is set by the Vietnamese government.

<sup>4</sup>World Bank, "*Taking stock: An updated on Vietnam's recent economic developments*", July 2015.

debt in the medium and long term when the budget may have to borrow to cover regular spending but not to invest in developing.

The major objectives of this paper are: (i) to provide first an overview of Vietnam's public debt and macroeconomic performances; (ii) to simulate the public debt sustainability for Vietnam in the future. This paper would contribute to the relevant field and especially for the case of Vietnam in several aspects. First, it is the first study about public debt sustainability by using a new approach of taxes revenues. The original empirical literature mainly focused on indicators of how far fiscal policy departs from sustainability in industrial countries (Buiters, 1985 and Blanchard, 1990). Currently, several IMF's working papers (2000, 2003b) focused on the link between fiscal and debt sustainability via the evolution of age-related spending on sustainability, budget constraint, indicators test or uncertainty in both advanced and emerging countries. Second, since the increase government revenue through tax collection in Vietnam has not been considered, the research on this field remains scarce and limited. Due to the lack of the past available fiscal balance data covering the past several decades, recent studies have just presented major risks and implication policies for Vietnam based on the growing fiscal deficit with a qualitative analysis (Hiep, 2016) or included some countries into panel data econometric for testing the budget deficit-growth nexus (Vien & Tatchalerm, 2015).

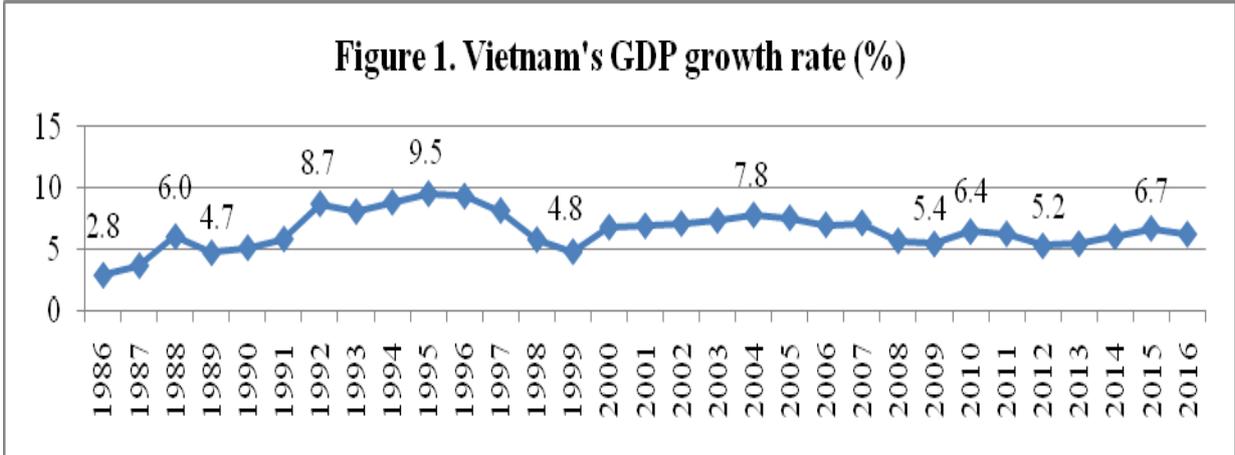
The remainder of the paper is structured as follows: Section 2 presents the current situation of economic growth and domestic and external debt as well as tax system in Vietnam. Section 3 simulates the Vietnam's public debt sustainability for development in the future based on the simulations on the effect of tax rate's change (Corporate Income Tax and Personal Income Tax) on total tax revenue for the next 10 years. Finally, the concluding remarks of this study is presented in the Section 4.

## **2. Economic growth and external and domestic debt as well as the current situation of the tax in Vietnam**

### ***2.1. Economic growth and structural issues***

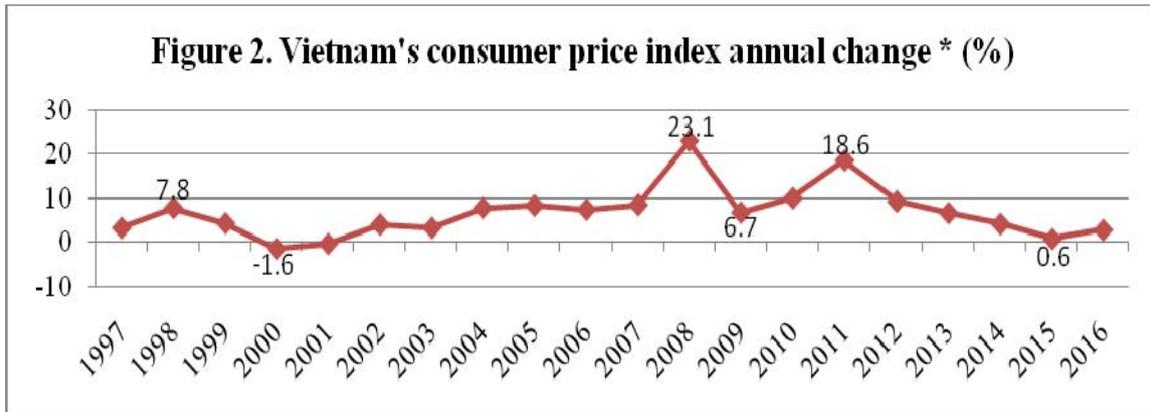
Figure 1 shows GDP's annual growth rate in Vietnam during the period 1986-2016. To begin, GDP growth increased more than 2 times from 2.8% in 1986 to 6.0% in 1988. This reflects the significant positive impact of innovation (Doi moi 1986) on economic growth in Vietnam. In the early to mid-1990s, GDP growth rate continued to increase and reached the highest point 9.5% in 1995. However, because of the Asian financial crisis in 1997, GDP

declined sharply by half from 9.5% in 1995 to 4.8% in 1999. After the crisis in 1997, the Vietnam’s economic has made remarkable progress in social and economic performance. The GDP growth rate remained at a stable level (7-8% per year) in 2000-2004 but was interrupted by the global crisis in 2007. It felt significantly to 5.2%, which was the lowest level in 2012. Since 2012 until the present, the economy of Vietnam has recovered quickly with GDP growth averaging more than 5% per year. Economic growth slowed to 6.2% in 2016 from 6.7% in 2015 due to the weaker agriculture and oil production offset booming services, manufacturing, and construction. GDP growth is projected to be higher at 6.5% in 2017 and 6.7% in 2018 (ADB Outlook 2017).



Source: Asian Development Bank, Key Indicators for Asia and the Pacific 2017

Figure 2 shows the consumer price index in Vietnam during the period 1997-2016. In the past years, CPI has not risen to 5%, except three times in 1998, 2008 and 2011 due to the effects of past crises. CPI index increased significantly from 4% in 2002 to the highest level recorded at 23.1% in 2008 because of global financial crisis. Despite of the effort of government in restraining inflation, CPI rose again at 18.6% in 2011. The recent CPI has been stabilized. This index has decreased from 9.2% in 2012 to 0.6% in 2015. In 2016, inflation averaged 2.7%, up from 0.6% in 2015. Contributing to the rise was a pickup in international oil prices, rising food prices because of drought, and upward adjustments to fees for public education and health care (ADB Outlook 2017). According to General Statistics Office of Vietnam, in the first 2 months of 2017, inflation edged up further, bringing the year-on-year rate to 5.0%.

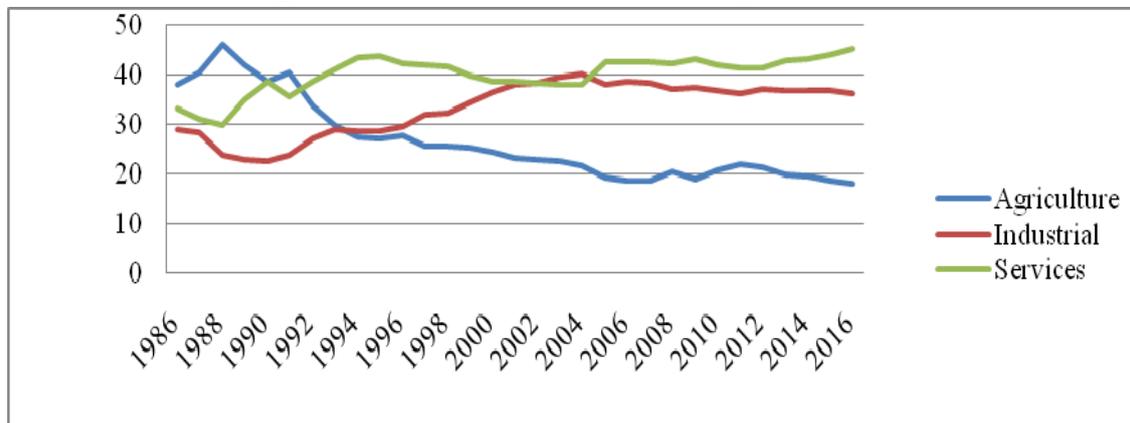


Source: Asian Development Bank, Key Indicators for Asia and the Pacific 2017

(\*) Data before 1997 is not available

The line graph in the figure 3 indicated that the industrial structure of the VN economy has been changed in the past decades. Agriculture is in trend of decline while industry and service has increased significantly. This could be the result that FDI has transformed the economic structure to have larger shares of manufacturing industries. Also, public investment in infrastructure and other industrial bases has been increased. These factors have necessitated the increased public expenditures and private borrowings (including external loans).

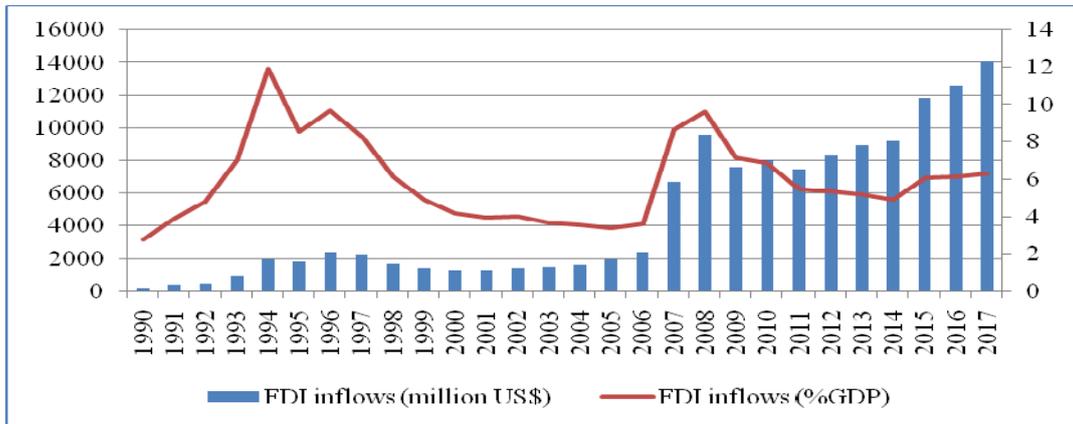
**Figure 3. Vietnam's structure of output as % of GDP**



Source: Asian Development Bank, Key Indicators for Asia and the Pacific 2017

One of the factors contributing to the growth of economy is FDI. Figure 4 shows the upward trend of FDI inflows into Vietnam since 1990s, reached the peak of 12% in 1994. However, due to financial crisis, it declined sharply, felt to 4% in 2000. FDI remained at 3-4% during 2000-2006, climbed up to 9.6% in 2008 and declined to average 5% GDP per year again after the global crisis.

**Figure 4. Vietnam’s FDI net inflows (million US\$) and FDI inflows (as % of GDP)**

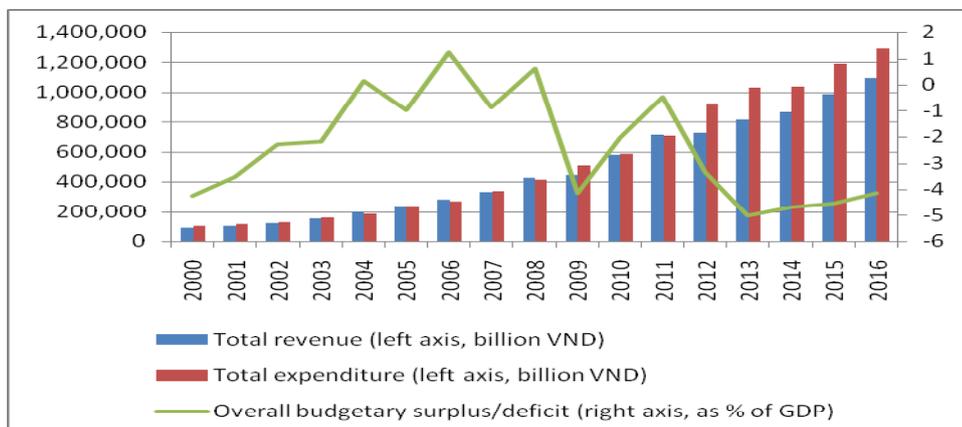


Source: World Bank, Data Indicators

## 2.2. Domestic and External debt in Vietnam

Figure 5 shows the fiscal balance and total government revenue and expenditure in Vietnam over the period 2000-2016. The bar chart indicates that the government spending is higher than its revenue over the period. Despite increasing revenue steadily, the gap between expenditure and revenue of government was broad for the recent years, especially after 2009. Public expenditure has increased in recent years due to the increasing needs of public infrastructure investment. On the other hand, the line chart shows that budget deficit amounted to less than 5% during the period 2000-2004. However, it changed dramatically in the pre-global financial crisis (2004-2008). In detail, Vietnam had the budget surplus for the first time in 2004 and reached the peak of 1.2% in 2006. After the crisis, fiscal balance deteriorated markedly; even it dropped to -5% in 2013. The budget deficit at the end of 2016 was recorded at -4.2% as percentage of GDP.

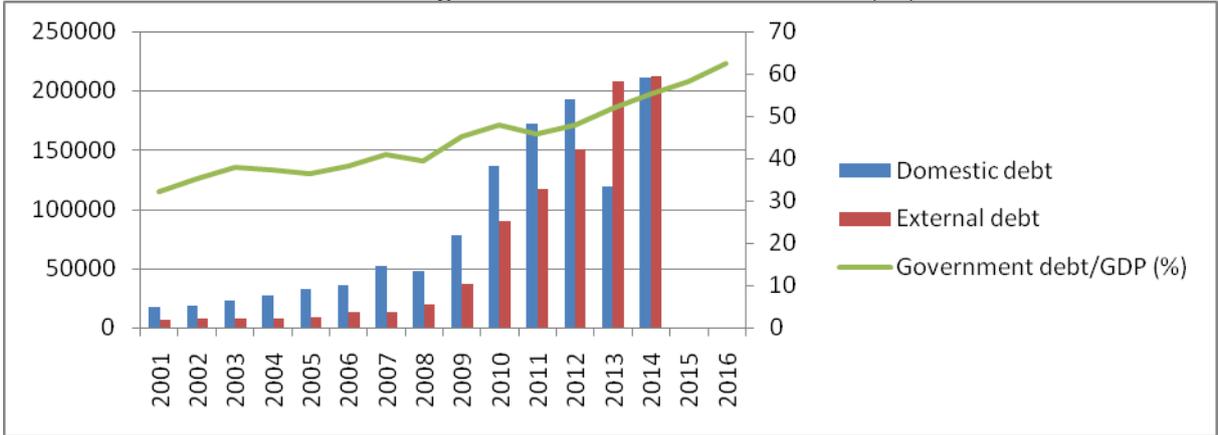
**Figure 5. Vietnam’s fiscal balance, total government revenue and expenditure**



Source: Asian Development Bank (ADB), Key Indicators for Asia and the Pacific 2017

Regarding government debt by maturity, figure 6 shows the change of domestic and external public debt in Vietnam over the period 2001-2016. Domestic debt is mostly used to finance budget deficit of Vietnamese government until 2012. In detail, more than 70% of total debt of government is derived from domestic resources in 2000-08. However, due to global financial crisis and widening in trade deficit which, in turn, contributed to a loss of confidence in the currency, large private capital outflows (as domestic residents switched their dong-denominated assets into foreign currency denominated assets or gold) led to severe loss in international reserves, and finally depreciations of the exchange rate.<sup>5</sup> As a result, Vietnam’s external debt increased by more than 7.5 times from 19,668 billion VND in 2008 to 150,582 billion VND in 2012. Even though, foreign borrowing has already exceeded by 1.75 times compared to domestic borrowing in 2013.

**Figure 6. Vietnam’s government debt structure (billion VND) and government debt-to-GDP ratio (%)**



Source: Ministry of Finance & The State Bank of Vietnam

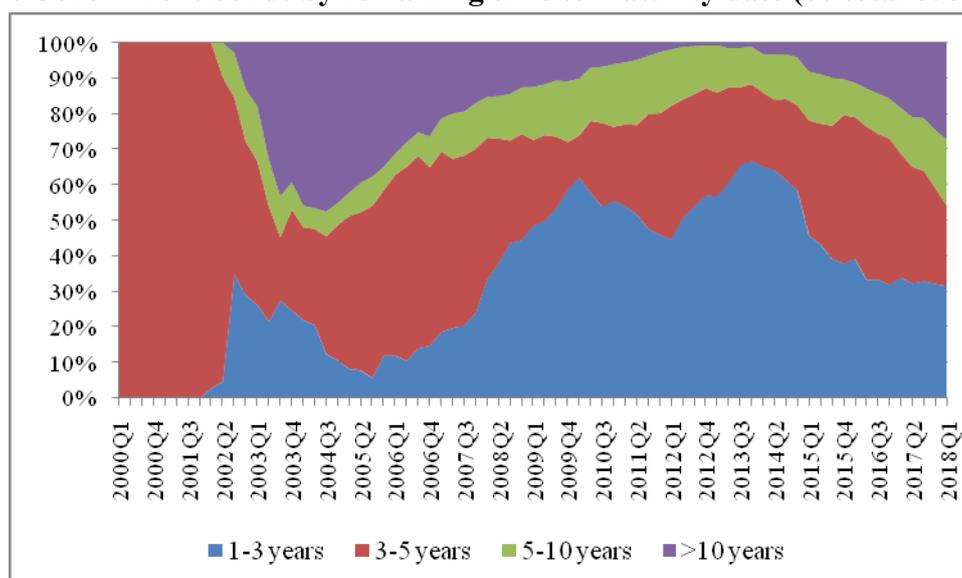
Note: Domestic and external debt figures are not available for 2015/16

Furthermore, Vietnam’s total public debt increased from approximately 40% of GDP in 2007 to approximately 56.3% of GDP in the end of 2010, slightly decreased to 54.9% of GDP in 2011 due to high inflation. Simultaneously, external debt of the nation increased from 32% to approximately 42% of GDP<sup>6</sup>. As at the end of 2014, Vietnam’s total outstanding public debt was 2.347 trillion dong (approximately US\$110 billion). According to IMF’s debt statistics, as a share of GDP, total public debt in Vietnam rose quickly from 48.4 percent in 2012 to 58.2 per cent at the end of 2017.

<sup>5</sup>IMF, “Debt sustainability analysis for Vietnam using the Debt Sustainability Framework for Low-Income Countries”, July 2010.

<sup>6</sup>The Government’s Report No. 305/BC-CP dated October 30th, 2012 on the situation of public debt.

**Figure 7. Government bonds by remaining time to maturity date (% total outstanding)**



Source: ADB Bonds (2018)

Due to the underdevelopment of the financial market and macroeconomic risks, government bonds were primarily issued in under 5-year maturities. Average maturity of newly issued bonds was 2.97 years in 2012. After that, long-term bonds were promoted to be issued more, however, short-term bonds still accounted for 54.2% of total government bonds, 18.7% were medium-term bonds, and 27.1% were long-term bonds at the end of the first quarter in 2018. (Figure 7).

Facing with this problem, National Assembly issued Resolution No. 78/2014/QH13 to limit government bonds under 5-year maturities from 2015. However, the demand for long-term bonds is still very low. The rate of government bond issuance was lower than the plan in which Ministry of Finance would implement the goal of increasing the average maturity up to 12.52 years in 2017 (Table 1).

**Table 1. Selected indicators of Government bond issuance**

	2012	2013	2014	2015	2016	2017
Volume (trillion VND)	144	182	330	256	281	244
Average interest rate	9.8%	7.79%	6.54%	6.26%	6.49%	6,07%
Average maturity	2.97	3.21	4.58	7.12	8.77	12,52

Source: Vietnam's Ministry of Finance

The debt service principal amount has increased by 3 times from 62.6 trillion VND in 2010 to 187,9 trillion VND in 2014. The volume of rollover was 260.8 trillion VND in 2014 (Table 2) and was estimated to 288.7 trillion VND in 2015. The primary reason is that

majority of bonds have been issued in a very short maturity since 2009, from 1 to 3 years. The maturity dates of these bonds have been starting in 2011; therefore, total principal payment has increased rapidly. The appearance of some kinds of short-term bills (3-6 month of maturity) also increased the amount of principal payment (VEPR, 2015).

**Table 2. Public debt payment using budgetary expenditure, 2010-2014 (billion VND)**

		2010	2011	2012	2013	2014	2015(R)	2016(P)
<b>Debt service payment</b>	Principle	62,602	78,450	110,548	125,818	187,917	203,443	160,592
	Interest	24,503	32,184	43,837	59,996	72,886	85,259	90,371
	<b>Total</b>	<b>87,105</b>	<b>110,634</b>	<b>154,386</b>	<b>185,814</b>	<b>260,803</b>	<b>288,702</b>	<b>250,963</b>
<b>Payment obligation</b>	Direct payments/ Budget revenue	17.6%	15.6%	14.6%	15.2%	13.5%	14,7%	15.1%
<b>Interest payment/Budget revenue</b>		4,3%	4.1%	5.4%	6.5%	8.3%	8.5%	8.9%
<b>Interest payment/Budget expenditure</b>		3,2%	4.2%	5.1%	5.2%	6.6%	6.8%	7.1%

*Source: Bulletin of Public debt No.6 and author's calculation based on data of Ministry of Finance*

Besides, interest payment also accounted for a large proportion of budget expenditure. Compared to total expenditure, interest payment increased rapidly, from 3.2% in 2010 to 6.8% in 2015. In terms of volume, interest payment increased by 2 times in a 2010-2015 period. The payment was only lower than education expenditure (17.3%), pension and social securities (10.8%), and public administration (9.7%), but dominated other kinds of current expenditure.<sup>7</sup> Expenditure for interest payment was often at a high level, forecasted up to 7.1% in 2016. This is hiding the budget for development investment, as a direct result of high public debt ratio.

### **2.3. Current tax rate of Corporate Income Tax, Personal Income Tax in Vietnam**

#### **Corporate Income Tax**

Corporate income tax is one of the most important sources of total tax revenue. The aim of the promulgation of CIT is to set up an equal playground between economic sectors. Turnover tax law and profit tax (came into effect from 1993) were premised for corporate income tax of Vietnam. In detail, turnover tax law includes 11 tax rates (from 0.5% to 40% out of turnover) while profit tax with 3 tax rates: 30% for production of industrial materials; 40% for production of consumption products, processed industry, and 50% for trade, services (in 1993 these rates were reduced to respective levels: 25%, 35% and 45%). However, FDI enterprises pay lower tax rates as regulated in foreign investment law.

In 2003, the National Congress of Vietnam approved the corporate income tax law (modified) No. 09/2003/QH11 on 17<sup>th</sup> June, 2003 with an ambition to improve the investment environment based on unifying tax rates and preferential tax between domestic enterprises

<sup>7</sup> VEPR Research Department, "Characteristics of Vietnamese public debt", VEPR Policy Discussion Note, PD-03, 2015.

and FDI enterprises. Of course, investors receiving highly preferential tax rates have the right to maintain this application or shift to apply a new preferential rate in the rest time of the projects if the new regulation is more profitable. However, in fact, the establishment of FDI projects had remained given higher preferential treatment than domestic enterprises until the investment law and the business law issued in 2005 (coming into effect on 01<sup>st</sup>July, 2006) because the government had continued encouraging and stepping up foreign investment attraction. From 2008 to the present, the CIT rate has changed 3 times in 2008, 2014 and 2016. In the phase 3 of tax reform in Vietnam (2006-2010), corporate income tax was improved in the direction of reduce tax rate, reduce objectives of exemption and reduction; unifying tax rate and tax incentive between economic sectors to encourage investment and make sure equity in competition. Standard tax rate declined from 25% in 2008 to 20% in 2016.

**Personal Income Tax**

Vietnam’s National Assembly issued the Law on Personal Income Tax (PIT) on November 21, 2007, which came into effect on January 1, 2009 and was subsequently amended in 2012 and 2014. Compared with the previous personal income tax, the new version is levied on a broader base - it is designed to include most forms of income, and not just labor compensation - it applies a single rate structure to foreigners and Vietnamese, and it has seven rather than four rates, the highest of which is 35 percent instead of the previous 40 percent. Before applying the tax rates, the taxpayer may deduct a personal allowance of VND 48 million, plus a further VND 19.2 million for each bona fide dependent. The law in its current form applies to individuals earning income, including those doing business who were previously included under corporate income tax.

**Table 3. Structure of Current and Previous Personal Income Tax**

Coverage	Previous Tax		Current Tax	
	Wages, salaries, bonuses, housing allowances		Wages, salaries, bonuses, housing allowances, business income, interest, dividends, capital gains, prizes	
Rates and base	For Vietnamese			
	Income per year, million VND	Tax rate, %	Taxable income per year, million VND	Tax rate, %
	0-60	0	0-60	5
	60-180	10	60-120	10
	180-300	20	120-216	15
	300-480	30	216-384	20
	>480	40	384-624	25

	For foreigners		624-960	30
			>960	35
	0-96	0	Personal deduction: 48 mil.VND Deduction/dependent: 19.2 mil.VND	
	96-240	10		
	240-600	20		
	600-960	30		
	>960	40		

Source: Law of Personal Income Tax (2009)

#### **2.4. Forecast on CIT tax rate in the future**

From the current situation of enterprises in Vietnam, it is noted that most of companies pay the CIT tax at the rate less than 20%. In addition, it is difficult to collect the CIT tax from foreign invested companies, especially multinational enterprises since they can reduce their overall tax burden by shifting profit towards low-tax countries, for example using the transfer pricing<sup>8</sup>. Besides, FDI has been so far successful and foreign firms, including Japanese companies may put more emphasis on the potential market development in Vietnam. Although the new corporate tax rate reduced to 20% from January 2016 for creating favorable investment environment for foreign investors, the subject of attracting FDI, and sustainability in reducing corporate tax rate, which could be some dilemma. However, foreign large companies may pay even if no advantage available for tax regime in a potential country likes Vietnam. Hence, I suppose that FDI firms should pay more corporate tax and the CIT revenue from local firms will become a major source of total CIT revenue with the increase of CIT tax rate in the future.

#### **2.5. Forecast on PIT tax rate in the future**

In December 2007, after a period of vigorous debate, the National Assembly approved a new Personal Income Tax Law, came into effect on January 1, 2009. Compared with the previous personal income tax, the new version is levied on a broader base - it is designed to include most forms of income, and not just labor compensation - it applies a single rate structure to foreigners and Vietnamese, and it has seven rather than four rates, the highest of which is 35 percent instead of the previous 40 percent. Before applying the tax rates, the taxpayer may deduct a personal allowance of VND 48 million, plus a further VND 19.2 million for each bona fide dependent. From 2015, individuals' business income exceeding VND100 million per year is subject to PIT at the deemed rates (%) on the revenue from sale

<sup>8</sup>Pehr-Johan N. et al., "Foreign direct investment: tax, transfer pricing and inefficient ownership", Research Institute of Industrial Economic, September 2004

of goods and provision of services in the range of 0.5-5%. Vietnam has become a lower-middle income country and in a progress of an upper-middle one by 2035 income tax based on progressivity should be promoted.

### **3. Simulation on Vietnam's public debt sustainability for development in the future**

#### ***3.1. Methodology***

Assume that for the next 10 years,

- (1) Tax revenue from Corporate Income Tax (CIT) and Personal Income Tax (PIT) will increase
- (2) The share of tax revenue will change with the increase in composition of PIT, CIT
- (3) Government expenditure will not so high

Due to the lack data of consumption tax, this paper just covers two categories of tax which are corporate income tax and personal income tax. Focusing on the factors which contribute to the increase of tax revenue, based on the past data, this paper calculates the elasticity of revenue to know how GDP growth rate can impact on tax revenue, and thereby impact on public debt in the future. Assume that percentage of GDP growth would be attained, this factor would affect the tax revenue. In fact, if the GDP growth increases, tax revenue will increase. Therefore, to simulate the effect of tax rate's change of on total tax revenue for the next 10 years, we suppose 3 cases of high, middle and low GDP growth rate. In each case, we calculate based on the data of the past 5 years of each tax category (corporate income tax, personal income tax) under the current tax system.

#### ***3.2. Simulation on impact of change in corporate income tax rate on total revenue***

Based on GDP at market prices (constant 2010 US\$), I calculate the absolute value of corporate tax revenue over the period 1997-2015. Due to the lack of data on tax revenue and GDP based on local currencies with constant prices, this paper uses the US\$ as the unit of currency in the simulation. Since the revenue from tax depends on tax rate and macroeconomic factors (inflation, GDP growth rate), I simulate the CIT revenue as percentage of GDP for the next 10 years according to 3 scenarios of tax rate and assumption of macroeconomic factors as follows.

Assume that current rate of CIT tax rate could be utilized to understand the simulation.

Assumption 1: The tax rate at 15% would increase the CIT revenue and total revenue

Assumption 2: The tax rate at 17% would increase the CIT revenue and total revenue

Assumption 3: The tax rate at 22% would decrease the CIT revenue and total revenue

Suppose that the elasticity of corporate income tax revenue (CIT) is calculated by:

$$\varepsilon = \frac{\Delta CIT_{t+1}}{\Delta CIT_t} = \frac{CIT_{t+1} - CIT_t}{CIT_{t+1} + CIT_t} \times \frac{CIT_t + CIT_{t-1}}{CIT_t - CIT_{t-1}} \quad (1)$$

Where:  $\varepsilon$  is elasticity of corporate income tax

$CIT_{t+1}, CIT_t, CIT_{t-1}$  denote corporate income tax revenue in the year t+1, t, t-1, respectively

From the data of the past 5 years (2013-2017), we have the average elasticity of CIT revenue is:  $\bar{\varepsilon} = 0.91$

Assume that the elasticity of CIT revenue in the next 10 years (2018-2027) is 0.95 and constant. Three cases of tax rate are set for simulation for the next 10 years are as follows.

Case 1:  $r = 15\%$

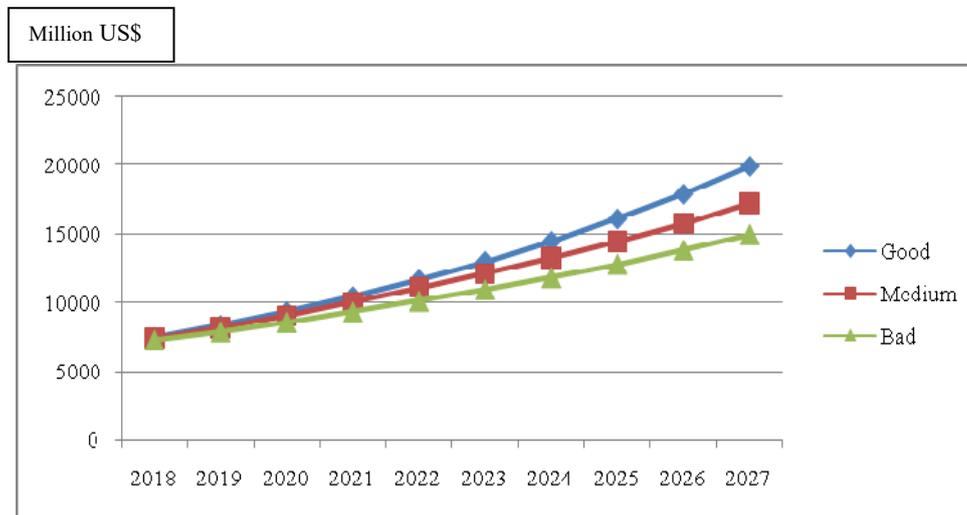
Case 2:  $r = 17\%$

Case 3:  $r = 22\%$

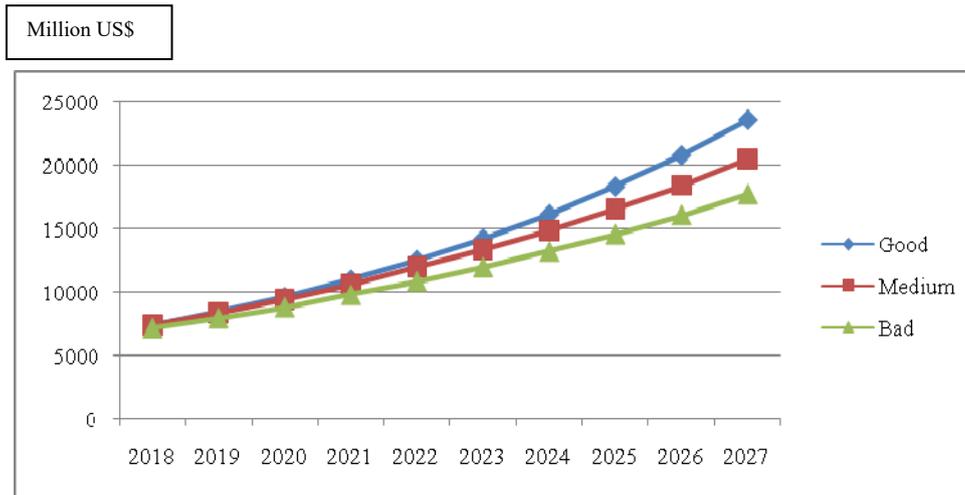
Assumption of GDP/ CPI in Vietnam during 2018-22 and 2023-27

	2018-2022			2023-2027		
	Good	Medium	Bad	Good	Medium	Bad
GDP growth	7.5%	6.5%	4.5%	7%	5%	4%
Inflation	4%	6%	8%	3%	5%	8%

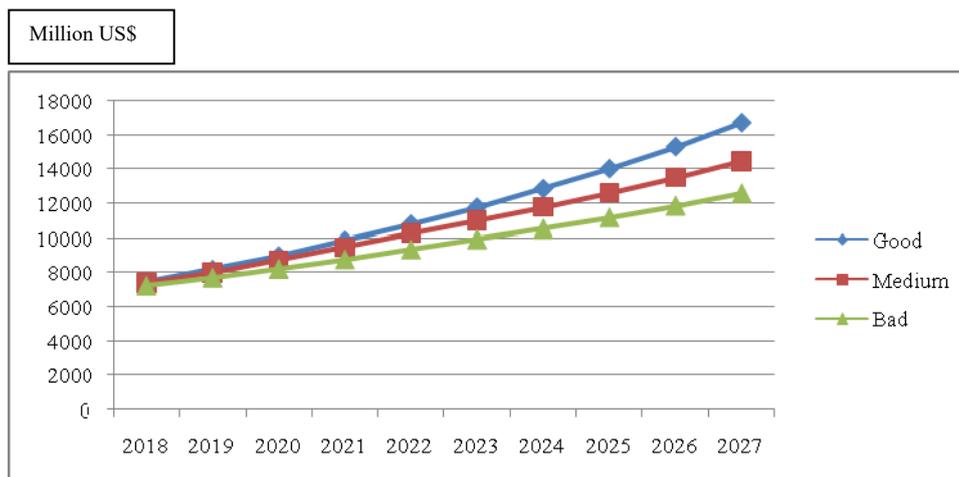
### Case 1: Simulation of CIT revenue when the tax rate is 15%



### Case 2: Simulation of CIT revenue when the tax rate is 17%



### Case 3: Simulation of CIT revenue when the tax rate is 22%



Source: Author's calculation.

Note: From 2023, the assumptions are different from the former period.

As shown in the above figures, when the tax rate remains at 15%, the CIT revenue is predicted to increase in the next 10 years but less than that in the case 2 (tax rate is 17%). It can be explained by that the foreign companies willing to invest in Vietnam even though the corporate income tax rate increase as Vietnam already has many comparative advantages and a strong investment climate. Investment decisions are influenced by various factors and Vietnam is appreciated as a new potential economy in the region. In the case 3, when the CIT rate increase to 22%, the CIT revenue tend to increase but less than that in the case 1 because if the tax rate is too high, companies will try to avoid paying tax.

### 3.3. Simulation on impact of change in personal income tax rate on total revenue

Like CIT, based on GDP at market prices (constant 2010 US\$), I calculate the absolute value of Personal income tax revenue over the period 1997-2015. The US\$ is used as the unit of currency in the simulation because of the lack data on GDP and tax revenue in local currencies. Since the revenue from tax depends on tax rate and macroeconomic factors (inflation, GDP growth rate), I simulate the PIT revenue as percentage of GDP for the next 10 years according to 3 scenarios of tax rate and assumption of macroeconomic factors as follows.

Assume that current rate of PIT tax rate could be utilized to understand the simulation.

The tax rate of:

Assumption 1: lowest income class: 7% & highest income class: 35% will increase total revenue

Assumption 2: lowest income class: 3% & highest income class: 45% will increase total revenue

Assumption 3: lowest income class: 2% & highest income class: 50% will increase total revenue

Suppose that the elasticity of PIT is calculated by:

$$\varepsilon = \frac{\Delta PIT_{t+1}}{\Delta PIT_t} = \frac{PIT_{t+1} - PIT_t}{PIT_{t+1} + PIT_t} \times \frac{PIT_t + PIT_{t-1}}{PIT_t - PIT_{t-1}} \quad (2)$$

Where:  $\varepsilon$  is elasticity of personal income tax

$PIT_{t+1}$ ,  $PIT_t$ ,  $PIT_{t-1}$  denote personal income tax revenue in the year t+1, t, t-1, respectively

From the data of the past 5 years (2013-2017), we have the average elasticity of PIT revenue is:  $\bar{\varepsilon} = 0.25$

Assume that the elasticity of PIT revenue in the next 10 years (2018-2027) is 0.3 and constant. Since Vietnam has become a middle-income country, the revenue from personal income tax is expected to increase in the future, both in absolute value and in the share of tax revenue. I suppose that there are 3 case of tax rate for the next 10 years as follows.

Case 1: lowest income class: 7% highest income class: 35%

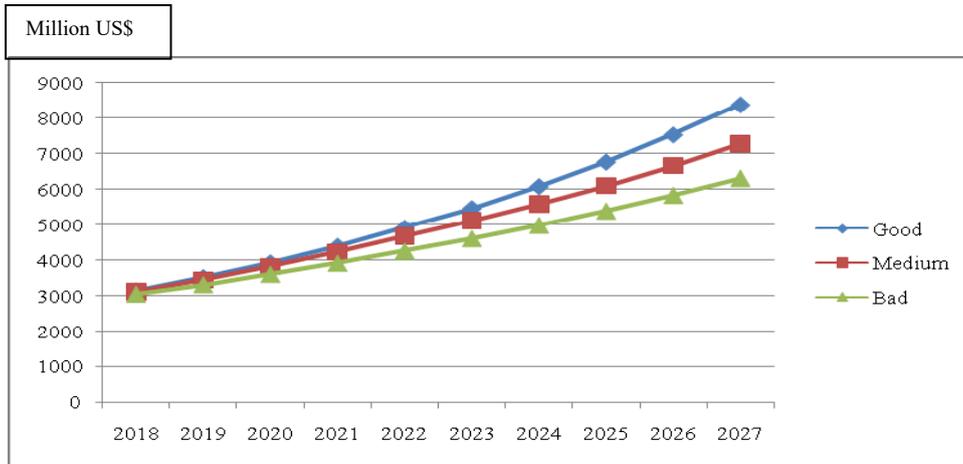
Case 2: lowest income class: 3% highest income class: 45%

Case 3: lowest income class: 2% highest income class: 50%

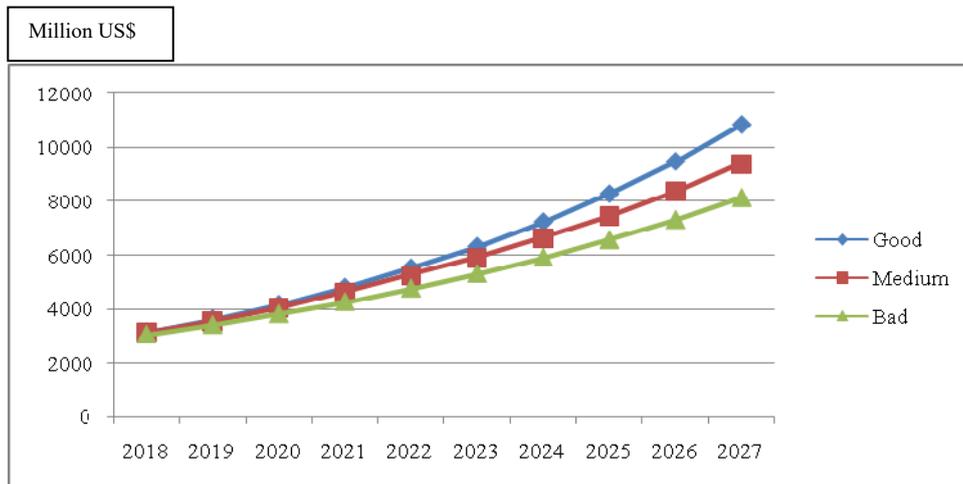
Assumption of GDP/ CPI in Vietnam during 2018-22 and 2023-27

	2018-2022			2023-2027		
	Good	Medium	Bad	Good	Medium	Bad
GDP growth	7.5%	6.5%	4.5%	7%	5%	4%
Inflation	4%	6%	8%	3%	5%	8%

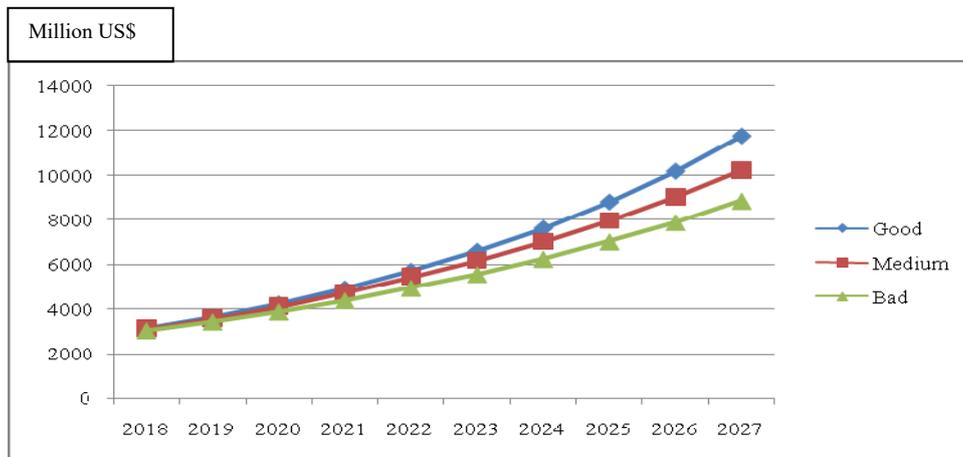
**Case 1: Simulation of PIT revenue when the tax rate is 7% and 35%**



**Case 2: Simulation of PIT revenue when the tax rate is 3% and 45%**



**Case 3: Simulation of PIT revenue when the tax rate is 2% and 50%**



Source: Author's calculation.

Note: From 2023, the assumptions are different from the former period.

The simulation results show that the contribution of personal income tax to total revenue is expected to increase larger in Case 2 and Case 3. Based on the assumption that the proportion of personal income tax in GDP is 1.9% (2017), the total revenue under Case 3 is expected to achieve the highest growth. The results clearly reflect the fact that the personal income tax would contribute to government revenue with the progressivity strengthening.

In addition, to increase total revenue, it is important to strengthen progressive tax with less burden on the low-income class while putting relatively heavier burden for the high-income class. As a result, increase in tax revenue from progressive tax system would increase in total revenue and reduce public debt and fiscal deficit. This result is in line with the studies of Ohta (2017) for the case of Japan.

### 3.4. Summary of the simulation on CIT and PIT revenue change

In brief, the simulation of corporate income tax and personal income tax in Vietnam shows that it is possible to achieve higher tax revenue and an improvement the fiscal balance through enhancement of progressive tax system.

**Table 4-1. Summary of the simulation on CIT revenue change**

	2018-22			2023-27		
	Good	Medium	Bad	Good	Medium	Bad
	ΔCIT revenue (%)					
Case 1: CIT rate = 15%	41.77	37.58	29.52	39.38	31.23	27.32
Case 2: CIT rate = 17%	47.95	43.53	34.87	48.22	39.46	35.26
Case 3: CIT rate = 22%	35.84	31.87	24.23	31.01	23.43	19.79

For the CIT (Table 4-1), the CIT revenue is around 42% and 48% higher than the current CIT revenue in Case 1 and Case 2, respectively in the good economic conditions. Meanwhile, it Case 3, the increase of CIT revenue is 35.8% which is less than two above case. This implies the fact that increase tax rate to reasonable level would encourage tax payer compliances, otherwise this may lead to tax avoidance or tax evasion of enterprises.

In fact, the tax evasion of domestic enterprises has become popular in recent years through establishment of subsidiary companies or purchase false or illegal invoice. According to the data of the General Department of Taxation, at the first quarter of 2018, the total tax debt is still about 82,877 billion VND, of which fines and late payment interest accounts for 41.4 per cent of the total debt. The debts that are not recoverable (because the taxpayer is dead or missing and concerned criminal liability) have also increased and accounted for 32,298

billion VND. In addition, the transfer pricing of FDI enterprises and multi-national companies has not been controlled in reality yet. In 2013, tax declarations showed that FDI companies have a 68,203 billion VND in deficit in total. Many of them are suspected of having transferred prices with their overseas-based mother companies (Giang, 2015).

This issue is derived from the limitations of knowledge and experience of tax agents regards the fields of the enterprises they are responsible for controlling, as well as of the relevantly legal regulations. Therefore, in the future, the new forms of violations in the economic integration period, such as transfer pricing, should be clearly defined and detailed. Furthermore, government should map out a detailed routing strategy for rising corporate income tax rate to achieve the tax collection target to finance fiscal deficit as well as public debt in the long-term.

**Table 4-2. Summary of the simulation on PIT revenue change**

	2018-22			2023-27		
	Good	Medium	Bad	Good	Medium	Bad
	ΔPIT revenue (%)					
Case 1: PIT rate = 7% & 35%	42.00	37.80	29.72	39.39	31.22	27.30
Case 2: PIT rate = 3% & 45%	51.38	46.82	38.08	52.82	41.84	39.37
Case 3: PIT rate = 2% & 50%	54.63	49.96	40.97	57.58	48.15	51.88

For the PIT (Table 4-2), the results show that the increase in tax rate would improve total PIT tax revenue. Particularly, the PIT revenue increases significantly to 42% and 51% compared to the current PIT revenue in Case 1 and Case 2, respectively. Meanwhile, the highest growth of PIT revenue is 57.6%, which is recorded in Case 3. In addition, as compare with Case 1 and Case 2, the estimation in Case 3 shows the burden on the middle and low-income class is low, while the burden on the higher income class would increase and the progressivity is most strengthened. Hence, in the future, improvement of income distribution by rising tax rate to the burden on wealthy people and reducing tax rate to the burden on middle and low-income group in Vietnam would increase the government revenue.

In fact, at the present, the ratio of personal income tax revenue to total tax revenue in Vietnam is relatively low in comparison with that in developing countries (16%) and developed countries (44.6%). As for the structure of personal income tax revenue, the share of tax revenue from regular income for foreign taxpayers accounted for a large proportion of around 60%; this share for Vietnamese taxpayers was around 30% while the remaining share

was from taxing irregular income. Therefore, in the context of international economic integration and significant changes in Vietnamese socio-economic conditions, it is necessary to radically and comprehensively reform personal income tax policy to meet the requirements of budget revenues, long-term stability of the tax policy and achieving strategic targets of socio-economic development (Huynh, 2006). The performance of tax administration could be improved by promoting such efforts such as enforcement of the tax laws, engagement or cooperation between tax offices and other institutions.

## **5. Concluding remarks**

The linkage between public debt and economic growth has been taken into consideration especially after the Global Financial Crisis and the recent European sovereign debt crisis. In many past studies<sup>9</sup> on this topic, public debt has put negative impact on economic growth via the effect of crowding out private investment or altering the composition of public spending, however, the case of Vietnam has not shown such effects until today. In the case of Vietnam, the accumulated debt is not oversized and government borrowing to finance increased public spending has beneficial impact on the nation's productivity. Particularly, while debt-financed public investment raises a country's debt ratios in the short-run, it can also enhance productivity through the construction of infrastructure, thus leading to higher economic growth. The public debt to GDP ratio in Vietnam is still under the safety threshold level, however, once the public debt exceeds the maximum level<sup>10</sup>, it may have adverse effect on economic growth. Therefore, it is necessary to keep public debt accumulation low to avoid interest rates variability that may lead to a fall in real output (Ebi & Imoke, 2017).

Major purposes of this paper are that what would be better systems to reduce public debt and increase government revenues by tax reforms. Particularly, this study focuses on the strengthening and orientation of tax structures and reform, in which mainly analyze two categories of tax: Corporate Income Tax, and Personal Income Tax to support sustainability of fiscal deficit as well as public debt in Vietnam in the medium to long-term. The results of the simulation on tax system show that strengthening the corporate income tax and personal income tax rate would contribute to total government revenue and thereby reduce public debt in the future. However, it should be careful in the increase of corporate income tax rate to

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<sup>9</sup> See Elmendorf & Mankiw (1999), Ardagna et al. (2007), Barrios et al. (2009) for further detail.

<sup>10</sup> See Thao PHAM (2018), "Impacts of public debt on economic growth in six ASEAN countries", expected in publication in *Ritsumeikan Annual Review of International Studies* for further detail.

prevent abusive tax-shifting or avoid tax of enterprises and foreign investors. Moreover, it is the most important task to strengthen the progressive income tax with higher tax rate for high-income groups while lower tax rate for low-income groups to achieve stable economic growth in the medium to long term and improve fiscal balance as well as tax revenue.

The limitation of this paper is that collected data on the tax system in Vietnam are still scarce. The elasticity of tax revenue and GDP growth may be changed overtime, and the results just show some possibilities of increasing tax revenues based on simple assumptions. The reality would be more complex and different from the simulation results, since the Vietnamese economy would dynamically change in the next decade. Therefore, the future studies are recommended to simulate the public debt sustainability via tax revenue side with extensive tax categories such as consumption tax or value added tax. This may give more accurate results regarding Vietnam's fiscal balance and tax revenue in the future.

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## APPENDIX 1. SIMULATION ON CORPORATE INCOME TAX

Unit: million USD

GDP 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2018-22	2023-27	
175,284	188,430	202,563	217,755	234,086	251,643	269,258	288,106	308,273	329,852	352,942	g=7.5	g=7	Good
175,284	186,677	198,811	211,734	225,497	240,154	252,162	264,770	278,009	291,909	306,504	g=6.5	g=5	Medium
175,284	183,172	191,415	200,028	209,029	218,436	227,173	236,260	245,711	255,539	265,760	g=4.5	g=4	Bad

### Case 1: CIT rate = 15%

CIT rev. 2017= 3.8% GDP=6660.792

<b>Good</b>	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	0.04
CIT rev. as %GDP	3.96	4.12	4.28	4.45	4.63	4.82	5.01	5.21	5.42	5.64	
CIT rev.	7,462	8,342	9,327	10,427	11,658	12,973	14,436	16,064	17,876	19,893	
Average	9443.18					16248.5					

<b>Medium</b>	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
CIT rev. as %GDP	3.96	4.12	4.28	4.45	4.63	4.82	5.01	5.21	5.42	5.64
CIT rev.	7,392	8,188	9,069	10,045	11,125	12,149	13,267	14,487	15,820	17,276
Average	9163.86					14599.74				

<b>Bad</b>	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
CIT rev. as %GDP	3.96	4.12	4.28	4.45	4.63	4.82	5.01	5.21	5.42	5.64
CIT rev.	7,254	7,883	8,567	9,311	10,119	10,945	11,838	12,804	13,849	14,979
Average	8626.95					12883.12				

### Case 2: CIT rate = 17%

CIT rev. 2017= 3.8%GDP=6660.792

<b>Good</b>	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	0.06
CIT rev. as %GDP	3.96	4.20	4.45	4.72	5.00	5.30	5.62	5.95	6.31	6.69	
CIT rev.	7,462	8,503	9,689	11,041	12,581	14,269	16,184	18,356	20,819	23,613	
Average	9854.93					18648.14					

<b>Medium</b>	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
CIT rev. as %GDP	3.96	4.20	4.45	4.72	5.00	5.30	5.62	5.95	6.31	6.69
CIT rev.	7,392	8,345	9,421	10,635	12,006	13,363	14,873	16,554	18,424	20,506
Average	9560.09					16744.03				

<b>Bad</b>	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
CIT rev. as %GDP	3.96	4.20	4.45	4.72	5.00	5.30	5.62	5.95	6.31	6.69
CIT rev.	7,254	8,035	8,900	9,859	10,920	12,039	13,272	14,631	16,129	17,780
Average	8993.56					14769.95				

**Case 3: CIT rate = 22%**

CIT rev. 2017= 3.8%GDP=6660.792

<b>Good</b>	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
CIT rev. as %GDP	3.96	4.04	4.12	4.20	4.29	4.37	4.46	4.55	4.64	4.73
CIT rev.	7,462	8,182	8,971	9,837	10,786	11,772	12,848	14,023	15,304	16,703
Average	9047.78					14130.22				

0.02

<b>Medium</b>	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
CIT rev. as %GDP	3.96	4.04	4.12	4.20	4.29	4.37	4.46	4.55	4.64	4.73
CIT rev.	7,392	8,030	8,723	9,476	10,294	11,025	11,808	12,646	13,544	14,506
Average	8783.31					12705.62				

<b>Bad</b>	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
CIT rev. as %GDP	3.96	4.04	4.12	4.20	4.29	4.37	4.46	4.55	4.64	4.73
CIT rev.	7,254	7,732	8,241	8,784	9,363	9,932	10,536	11,177	11,856	12,577
Average	8,275					11215.84				

	2018-22						2023-27					
	Good		Medium		Bad		Good		Medium		Bad	
	Average CIT rev. change	ΔCIT rev. (%)	Average CIT rev. change	ΔCIT rev. (%)	Average CIT rev. change	ΔCIT rev. (%)	Average CIT rev. change	ΔCIT rev. (%)	Average CIT rev. change	ΔCIT rev. (%)	Average CIT rev. change	ΔCIT rev. (%)
Case 1: CIT rate = 15%	9,443	41.8	9,164	37.6	8626.955	29.52	16,249	39.4	14,600	31.2	12883.1182	27.32
Case 2: CIT rate = 17%	9,855	48.0	9,560	43.5	8993.558	34.87	18,648	48.2	16,744	39.5	14769.95436	35.26
Case 3: CIT rate = 22%	9,048	35.8	8,783	31.9	8274.733	24.23	14,130	31.0	12,706	23.4	11215.84422	19.79

## APPENDIX 2. SIMULATION ON PERSONAL INCOME TAX

Unit: million USD

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2018-22	2023-27		
GDP 2017	175,284	188,430	202,563	217,755	234,086	251,643	269,258	288,106	308,273	329,852	352,942	g=7.5	g=7	Good
	175,284	186,677	198,811	211,734	225,497	240,154	252,162	264,770	278,009	291,909	306,504	g=6.5	g=5	Medium
	175,284	183,172	191,415	200,028	209,029	218,436	227,173	236,260	245,711	255,539	265,760	g=4.5	g=4	Bad

### Case 1: PIT rate = 7% & 35%

PIT rev. 2017= 1.6%GDP = 2804.54

Good	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	0.04
PIT rev. as %GDP	1.67	1.74	1.81	1.88	1.95	2.03	2.11	2.20	2.29	2.38	
PIT rev.	3,147	3,518	3,933	4,397	4,916	5,471	6,088	6,775	7,539	8,389	
Average	3982.35					6852.27					

Medium	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
PIT rev. as %GDP	1.67	1.74	1.81	1.88	1.95	2.03	2.11	2.20	2.29	2.38
PIT rev.	3,118	3,453	3,824	4,236	4,692	5,123	5,595	6,110	6,672	7,285
Average	3864.56					6156.96				

<b>Bad</b>	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
PIT rev. as %GDP	1.67	1.74	1.81	1.88	1.95	2.03	2.11	2.20	2.29	2.38
PIT rev.	3,059	3,324	3,613	3,927	4,268	4,616	4,992	5,400	5,840	6,317
Average	3638.13					5433.03				

**Case 2: PIT rate = 3% & 45%**

PIT rev. 2017= 1.6%GDP=2804.54

<b>Good</b>	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
PIT rev. as %GDP	1.67	1.79	1.91	2.05	2.19	2.34	2.51	2.68	2.87	3.07
PIT rev.	3,147	3,620	4,163	4,789	5,509	6,307	7,221	8,267	9,465	10,836
Average	4245.47					8418.99				

0.07

<b>Medium</b>	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
PIT rev. as %GDP	1.67	1.79	1.91	2.05	2.19	2.34	2.51	2.68	2.87	3.07
PIT rev.	3,118	3,553	4,048	4,613	5,257	5,906	6,636	7,455	8,376	9,410
Average	4117.74					7556.72				

<b>Bad</b>	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
PIT rev. as %GDP	1.67	1.79	1.91	2.05	2.19	2.34	2.51	2.68	2.87	3.07
PIT rev.	3,059	3,420	3,825	4,276	4,782	5,321	5,921	6,589	7,332	8,159
Average	3872.37					6664.62				

**Case 3: PIT rate = 2% & 50%**

PIT rev. 2017= 1.6%GDP=2804.54

<b>Good</b>	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
PIT rev. as %GDP	1.67	1.80	1.95	2.10	2.27	2.45	2.65	2.86	3.09	3.34
PIT rev.	3,147	3,653	4,242	4,925	5,717	6,607	7,635	8,823	10,196	11,782
Average	4336.74					9008.68				

0.08

<b>Medium</b>	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
PIT rev. as %GDP	1.67	1.80	1.95	2.10	2.27	2.45	2.65	2.86	3.09	3.34
PIT rev.	3,118	3,586	4,124	4,744	5,456	6,187	7,017	7,957	9,023	10,232
Average	4205.56					8083.24				

<b>Bad</b>	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
PIT rev. as %GDP	1.67	1.80	1.95	2.10	2.27	2.45	2.65	2.86	3.09	3.34
PIT rev.	3,059	3,452	3,896	4,397	4,963	5,574	6,261	7,032	7,899	8,872
Average	3,954					7127.74				

	2018-22						2023-27					
	Good		Medium		Bad		Good		Medium		Bad	
	Average PIT rev. change	ΔPIT rev. (%)	Average PIT rev. change	ΔPIT rev. (%)	Average PIT rev. change	ΔPIT rev. (%)	Average PIT rev. change	ΔPIT rev. (%)	Average PIT rev. change	ΔPIT rev. (%)	Average PIT rev. change	ΔPIT rev. (%)
<b>Case 1: PIT rate = 7% &amp; 35%</b>	3,982	42.0	3,865	37.8	3638	29.72	6,852	39.4	6,157	31.2	5433.032	27.30
<b>Case 2: PIT rate = 3% &amp; 45%</b>	4,245	51.4	4,118	46.8	3872	38.08	8,419	52.8	7,557	41.8	6664.621	39.37
<b>Case 3: PIT rate = 2% &amp; 50%</b>	4,337	54.6	4,206	50.0	3953.587	40.97	9,009	57.6	8,083	48.2	7127.737	51.88