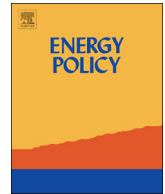




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General equilibrium economy-wide impacts of the increased energy taxes in Vietnam



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ABSTRACT

The Vietnamese Government is proposing a new tax levy on either petroleum products or coal, or both. That is, the Government expects to increase the current tax rates to the maximum levels set previously. In this instance, the tax on coal is intended to increase by 50%, while the tax on petroleum products is intended to increase by 33.33%. This study employs a computable general equilibrium model to assess the effects of these increases in taxes on the Vietnamese economy, focusing on energy, transportation, and the private sectors. Results show that an increase in tax on petroleum products will considerably affect the country with a reduction of real GDP by 1.99%. Exports and imports are also highly unfavorably affected. In this instance, the total emission level will be reduced by 7.12%. The increased tax on coal, however, will allow Vietnam to experience much lower unfavorable effects, while being able to cut a substantial amount of the emission level. For example, real GDP would only decline by 0.51%, while total emission level will be reduced by 10.25%. If these taxes are increased together, Vietnam will experience considerable contractions in the economy, but it is able to reduce a substantial emission level.

1. Introduction

Rapid industrialization and economic growth rates in Vietnam in recent decades have considerably increased demands for fossil fuels, leading to substantial increases in the emission levels in the country. In particular, greenhouse gas (GHG) emissions in Vietnam have increased by 57% in 1990–2010 and 99% in 2000–2012, reaching 311Mt of Carbon Dioxide equivalent (CO₂-e) in 2012 (World Bank, 2015). As a result, Vietnam is among the most rapidly growing emission countries that contribute to the greenhouse effect globally. Vietnam, however, was one of the first countries to ratify the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol in order to tackle climate change and limit increased global temperature below 2-Celsius degrees.¹

The country has generated several national and regional programs and in planning, estimates the potential impact on climate change and responses to climate change issues. Vietnam has also introduced policies to mitigate GHG emissions. In addition, several programs and policies have been introduced to improve energy efficiency and renewable energy production technology so that the country is able to

move to a low carbon economy and achieve a sustainable development in the near future (Luong, 2015). For example, the National Target Programs on Energy Efficiency was issued in 2006, while the law on Economical and Efficient Use of Energy was launched in 2010. On January 1st, 2012, the Environmental Protection Tax was also commenced in order to apply tax rates on specific goods, including petroleum, oil, gas, and coal that are both purchased domestically and imported.² However, these low tax rates and programs are apparently not powerful enough to enable Vietnam to lower its emissions growth rates as the emission level is still growing at a high rate (Fig. 1). In this context, a more powerful climate change policy is needed with an emissions trading scheme that can restrict the country's emissions to a fixed level, as was proposed in 2012 with Prime Minister Nguyen Tan Dung not signing off the plan until October 2015.³

Recently, Vietnam further committed to the Paris Agreement on climate change, putting the country under greater pressures to reduce its emission levels. In particular, the Vietnamese Government committed to reduce the country's emission level by 8% by 2030 compared to the business-as-usual scenario or by 25% if there are international supports to finance the implementation of adaptation measures, as the

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¹ <http://www4.unfccc.int/ndcregistry/PublishedDocuments/Viet%20Nam%20First/VIETNAM%27S%20INDC.pdf>.

² <http://vietnamlawmagazine.vn/environmental-protection-tax-4058.html>.

³ <https://carbon-pulse.com/11090/>.

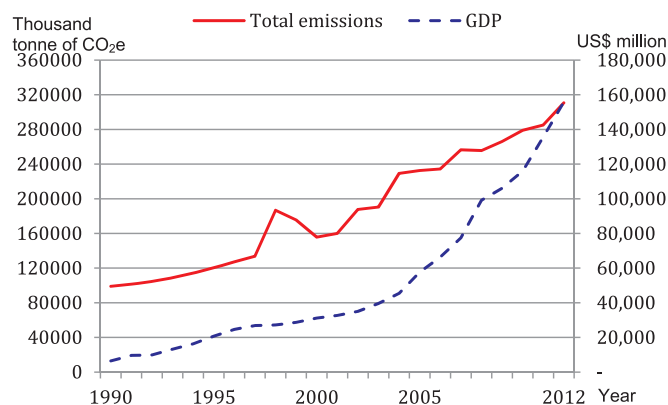


Fig. 1. GDP and total GHG emissions in Vietnam in 1990–2012. Source: World Bank (2015, 2017a).

national budget is estimated to adequately cover only one-third of the financial needs.⁴ Given 66% of total emissions released from energy resources (United States Agency for International Development, 2016), the Vietnamese Government is expecting to reduce substantial emission levels from energy consumption, as well as to promote the development of renewable energy in a sustainable economy. Consequently, the Government has recently proposed to increase the tax rates on consumed energy to the maximum levels set previously.⁵ In particular, the Government proposed to increase the consumption tax rates for petroleum and diesel by 33.33% and for coal by 50% (Fig. 2). Of these, the Government primarily recommends to increase the tax rate on petroleum products with additional consideration of the increased tax on coal; hence, it is still uncertain whether the country would only increase the tax rates on the petroleum products or also increase the tax rates on coal (Vu, 2018). Such increases are also dependent on approval by the National Assembly. There are therefore several potential scenarios: (1) only one increased tax on petroleum products or coal is approved or (2) the increased taxes on these two groups of fuels are implemented simultaneously or (3) no increased taxes are allowed.

In any circumstances, the increased energy taxes are twofold. On one hand, the new taxes would help the country to lower its emission level in order to somewhat fulfill the committed emissions target at the Paris Conference. This policy, however, results in unknown and uncertain emission reductions in a long period. Hence, to achieve the committed emission target the country may need to have a stronger and consistent policy, such as an emissions trading scheme, which allows a certain emission level that a country is permitted to release into the atmosphere. On the other hand, the new taxes would help the Vietnamese Government to improve its budget because the Government has been running a budget deficit for a decade, with a deficit in 2017 equivalent to -3.5% of the country's gross domestic product (GDP) (Lan, 2018; Trading Economics, 2018). Such substantially increased taxes though only on petroleum products or coal or on both groups of these energy commodities simultaneously are recently major concerns; hence, the National Assembly continues to delay consideration of the proposal because these commodities are major energy sources for the economy (Nhan Dan, 2018). Such increased taxes may have considerable unfavorable impacts on the Vietnamese economy, energy sectors, transportation and households. In addition, whether emission levels are considerably reduced under these increased taxes is still questionable.

This study aims to answer the question what are the likely economy-

⁴ <http://www4.unfccc.int/ndcregistry/PublishedDocuments/Viet%20Nam%20First/VIETNAM%27S%20INDC.pdf>.

⁵ It is noted that under the Law on Environmental Protection Tax, there are specific maximum levels of the taxes on particular fuels that the Government is not allowed to exceed in such tax rates on fuels. This Law is intended to stabilize the development of the economy (The National Assembly, 2010).

wide impacts of such increased taxes on energy, particularly focusing on energy, transportation and household sectors. This study also estimates the efficiency of the new tax rates in terms of emission reduction in order to answer whether tradeoffs between economic downgrade and amount of emission abatements are reasonable. In addition, this study will provide useful information about the national budget and government consumption. In this context, it is still uncertain whether the country will only increase the tax rate on either petroleum products or coal, or if it will increase the tax rates on both petroleum products and coal simultaneously. This study therefore examines the impacts of each policy separately. In addition, the Global Trade Analysis Project Energy/Environment (GTAP-E) model is employed with updated database from 2011 to 2018. This is a linear model; hence, it is likely to predict the potential impacts when the increased taxes on petroleum products and coal are implemented at the same time. This is because the impacts of such a scenario are linearly aggregated from the impacts when these two policies are implemented separately.

In the model, non-CO₂ emissions are also incorporated in the database to capture most emission levels in all countries or regions so that emission level fluctuations can be estimated accurately. This computable general equilibrium (CGE) approach has been selected, as it includes all agents and economic interactions in an economy. All households, governments, producers and investors are well connected in the model through the sets of equations based on economic theory. There are also domestic and international markets that importers and exporters connect together via a bilateral mechanism. Consequently, when a tax, such as an environmental tax, is imposed on particular commodities, the potential effects that spread out to other sectors throughout the economy can be captured by using this approach.

2. Survey of climate change policies and energy tax

Climate change policies and energy taxes have been introduced in many countries around the world. For example, emissions trading schemes are in effect in the European Union countries, South Korea, New Zealand, and in California in the United States, an Emissions Reduction Fund has been implemented in Australia, and taxes have been imposed on fuels in China and the United States. These policies attract great attention from policy makers and researchers, leading to substantial literature development on this topic (for example, see Babiker et al., 2003; Böhringer and Welsch, 2004; Lennox and Van Nieuwkoop, 2010; Meng et al., 2013; Nong et al., 2017; Nong and Siriwardana, 2018a, 2018b). There are also many studies that examine the impact of fuel taxes, for example Andre et al. (2005), Fullerton and Heutel (2007), Golosov et al. (2014), and Rausch and Schwarz (2016).

Studies of an environmental tax in Vietnam are limited, particularly those that use a general equilibrium approach. There are several studies that examine other aspects or use different techniques to tackle climate change but do not directly relate to assessing the impact of an environmental tax on the Vietnamese economy. For example, Le et al. (2013) examined the social costs of fuel transition between biofuels and fossil fuels by using the life-cycle assessment approach, which estimates the emission levels released from the production and consumption of biofuels. The results show that the substitution of ethanol for gasoline considerably reduces the social costs of gasoline. Ha-Duong and Nguyen-Trinh (2017) examined the costs of different techniques of carbon capture and storage in Vietnam and found that capture readiness would reduce the costs but it has not yet been mandatory. Zimmer et al. (2015) interviewed policymakers and other stakeholders to investigate what are the motivations for Vietnam towards the introduction of climate change policies in order to move to a low carbon economy. Zimmer et al. found that the motivations among Vietnamese are complex as Vietnam has a small economy for which emission reductions would only have a small contribution towards reducing global warming impacts. Greater interest towards introducing climate change policies would need to combine financial and economic restructuring

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