

Research Proposal: Environmental taxation and double dividend hypothesis

Hien Nguyen

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1 Introduction

Environmental taxes have been increasingly used to address the current serious environmental problems. Indeed, Vietnam biggest cities including Hanoi and Ho Chi Minh city have been having pollution problems recently. Even though environmental tax is not new in Vietnam, the government want to propose a hike in the environmental taxes to better tackle the environmental impacts not only on the people but also the economy itself. Although there are proposals regarding the hike of environmental taxes, there needs to be further consideration for the implementation. The society faces a trade-off between internalizing environmental externalities and raising revenues in the least distortionary way. It is important to look at the impacts of the environmental tax hikes

2 Background

Vietnam environmental taxes first introduced in 2010 and implemented in 2012. The government proposes to bring in the hikes in environmental taxes on oil and petroleum products to effect from July 1, 2018. Due to environmental incentives, the government levy taxes not only on energy in terms of refined fuels and coals, but also on environmental harmful substances (HCFCs) **Johannes2011**, selected pesticides and soft plastic bags.

Environmental incentive did not seem to be the only reason behind the tax hike. Petroleum products have become a major revenue source of the country with proceeds from import duty on petrol and oil now accounting for around 7 percent of the State's income. This revenue is on the decreases as import duty rates on petroleum products have reduced considerably over the last few years due to the country's tariff commitments. The government tries to balance the reduction in import tariffs

Regarding Vietnam's oil industry, Vietnam has become more reliant on imported crude oil for its refineries: offset the slowing domestic output. Vietnam is a net exporter of crude oil but a net importer of oil products. The country must import a majority of refined oil products to satisfy demand. A notable event that might be of importance to consider is that the 5 percent import tax was abolished on Nov 1, 2019.

Environmental taxes would without a doubt come at a cost. The increase in environmental taxes would have an effect on the transport industry

and ultimately the selling price of a number of products. Substituting environmental taxes for pre-existing distortionary taxes on income may yield a "double dividend," not only a cleaner environment but also a less distortionary way of revenue raising.

3 Literature Review

First, I look at a really thorough paper regarding environmental taxes, "Optimal environmental taxation in terms of other taxes" (**Bovenberg1994**). The paper examines the optimal setting of environmental taxes in economies where other distortionary taxes are present. Costs associated with (remaining) pre-existing distortions are greater than the benefits from reductions in distortionary taxes made possible by the carbon tax revenues. The paper points out that pre-existing taxes reduce the optimal tax rate. Even though the new environmental taxes can bring out more optimal way of revenue-raising, its efficiency may be affected by the magnitude of pre-existing taxes.

I also look at a paper that look at the environmental tax impact especially in Vietnam, "The incidence of Vietnam's environmental tax law: general equilibrium analysis" (**Coxhead2011**). In trade-dependent low-income economies like Vietnam, the prospect of the energy tax raises additional concerns at the points where the tax intersects with other targets of development policy. The paper focuses on analyzing the impacts of the environmental taxes on the industries activities and in turn on distribution of household in-

come. The paper would address these questions including: How will the tax alter the competitiveness of industries producing exports and import substitutes? How will it alter prospects for employment growth? What effects will it have on poverty?

After looking over the literature, there are questions I want to address

Does the environmental tax in Vietnam carry the double dividend? Including both the "green dividend" (environmental dividend) and "blue dividend" (non-environmental dividend) as in **Mooji1998**

Looking specifically at the change in environmental taxes and the change in import duties side by side

Whether the hikes in environmental taxes can not only compensate for the decreasing import tariffs in terms of revenue but also other impacts on the whole economy

Distortionary taxes reduce social welfare so if revenue gains from environmental taxes (which help correct pollution externalities) are used in a budget-neutral fashion to reduce the rate of distortionary taxes such as import tariffs or factor income taxes (**Bovenberg1994**). There have been articles on the factor income taxes. This paper want to further look into whether double dividend hypothesis holds for environmental given import tariffs. Previous literature on the double dividend suggests, however, that environmental taxes typically exacerbate, rather than alleviate, pre-existing tax distortions. Indeed, under some circumstances, the cost of increasing environmental taxes might outweigh the benefits of minimizing the external-

ities.

4 Dataset and empirical methods

4.1 Dataset

There might be certain factors affecting the impact of environmental taxes. The impact may depend on whether new tax revenues are used to cut other taxes, thus looking at the tax interaction would be important.

It would be of interest to look import tariffs data focusing on crude oil import tariffs to further see the change in import tariffs over time. The paper would also investigate the environmental taxes data on each pollutants specifically since the pollutants may vary across industries.

The potential data to look at is the Vietnam Social Accounting Matrix. A Social Accounting Matrix (SAM) (**Wider2012**) is an economy-wide data set that captures flows and circulations of products and monetary flows, and reflects the process of initial income distribution and redistribution of industries and economic institutions of an economy in a certain year. SAM for Vietnam is based on the most recent input-output enterprise survey data for the year 2012 (in the form of a supply-use table, SUT) and the Vietnam Household Living Standard Survey (VHLSS). This dataset also contains the data on taxes, consumption and production both overall and sector-specific.

Vietnam Household Living Standards Survey are to be conducted (in every two- year) to monitor systematically the living standard of Vietnam's

<i>Other manufacturings</i>	<i>18.81</i>	<i>35.69</i>	<i>55.17</i>
Wood, products of wood & cork, except furniture, articles of straw & plaiting materials	0.06	0.26	0.05
Paper & paper products	0.06	0.23	3.21
Printing & recording services	0.02	0.06	0.05
Coke oven products	0.00	0.01	0.01
Refined petroleum products	1.72	2.57	4.77
Other petroleum products	0.00	0.00	0.05
Basic chemicals	0.37	0.39	0.55
Fertilizers & nitrogen products	0.45	0.69	0.25
Plastic & synthetic rubber in primary forms	0.07	0.17	0.55
Pesticides & other agrochemical products	0.14	0.25	0.15

Figure 1: Second column: activity tax, third column: sales tax, fourth column: import taxes

societies and at the same time, to exercise the monitoring and assessment of the implementation of the Comprehensive Poverty Alleviation and Growth Strategy.

The refined petroleum products can also be divided into each specific product and we can calculate the ad valorem tax from there (change in tax - reduce in cost due to decrease in import duty)

In this Table, the specific tax rates- i.e. tax rates per unit of physical quantity – are transformed into equivalent ad valorem tax rates, which express the tax rate as a percentage of the price of a good prior to the tax reform. The ad valorem tax rates in columns C1 and C2 show the size of the additional wedge the tax drives between the supply price (received by the seller net of tax) and the price paid by the purchaser as a proportion of the initial price.

Gasoline has currently a price of 17,000 VND per litre before the tax reform (Viet Nam News, 11 May 2010). When the government imposes a specific tax of 4,000 VND per litre, the ad valorem equivalent environmental

tax rate is $4/17 = 23.5$ percent. However, with a simultaneous drop in other fees on gasoline of 1000 VND, the net increase in the ad valorem tax rate is only $3/17 = 17.6$ percent-points relative to the situation before the tax reform. The tax rates for other refined fuels subject to the tax are calculated in the same way. The expenditure weights used to determine the average percentage tax rate increase for refined fuels are derived from data provided by the MoF.

4.2 Model

Adopt a general equilibrium approach, taking account of known economic linkages among production activities, employment, wages, household incomes, consumer expenditures, trade, government revenues and other important macroeconomic variables. The paper might specifically look at the efficiency model with tax interaction with an account for some special characteristics of the oil-gas and synfuels industry. So long as imports are the marginal source of supply to the domestic economy, domestic producers of oil and gas receive the world price (adjusted for tariffs or taxes) for their own output.

In each industry, a nested production structure accounts for substitution between different forms of energy as well as between energy and other inputs. Each industry produces a distinct output (X), which is a function of the inputs of labor (L), capital (K), energy composite (E) and a materials

composite (M), as well as the current level of investment (I):

$$X = f[g(L, K), h(E, M)] - \Phi(I/K) \quad (1)$$

$$E = E(\bar{x}_2, \bar{x}_3, \bar{x}_4, \bar{x}_5, \bar{x}_6, \bar{x}_7) \quad (2)$$

$$M = M(\bar{x}_1, \bar{x}_8, \dots, \bar{x}_{13}) \quad (3)$$

where \bar{x}_i is a composite of domestically produced and foreign made input i.

Managers of firms choose input quantities and investment levels to maximize the value of the firm. The investment decision takes account of the adjustment (or installation) costs represented by $\Phi(I/K)I$ in equation (1).

The production structure in the oil and gas industry is somewhat more complex than in other industries to account for the nonrenewable nature of oil and gas shocks. The production specification is:

$$X = \gamma(Z)f[g(L, K), h(E, M)] - \Phi(I/K)I \quad (4)$$

where γ is a decreasing function of Z, the amount of cumulative extraction of oil and gas up to the beginning of the current period. This captures the idea that as Z rises (or, equivalently, as reserves are depleted), it becomes increasingly difficult to extract oil and gas resources, so that greater quantities of K, L, E, and M are required to achieve any given level of extraction (output). Increasing production costs ultimately induce oil and gas producers to

remove their capital from this industry.

5 Concluding remarks and possible developments

Environmental tax revenues could be used to offset cost increases experienced by energy-intensive and/or employment-intensive industries.

To minimize the impact on these industries, and therefore on national employment and export competitiveness, the Vietnamese government could consider using environmental tax receipts to compensate them, for example by means of a corporate tax rebate proportionate to their input cost increases.

It is important that I look at the CGE model more closely and decide the set up of the model taking into account the specific dataset from Vietnam.

Here, I have only been able to find the data until 2012 even though there have been new proposal regarding environmental taxes hike in 2018 also. As a result, I need to look for more recent data and plug in the model to analyze a clearer pattern of change.

References