



SOFT DRINK INDUSTRY AND THE ECONOMIC IMPACT OF EXCISE TAX ON NON-ALCOHOLIC CARBONATED SOFT DRINK IN VIETNAM

Dr. Nguyen Dinh Chuc



Introduction

- ❖ The Law on Excise Tax:
 - Ratified in 2008; 16 groups of commodities
 - Role: the economic development, state budget, production and consumption pattern, the commitments of the country with WTO,...
- ❖ 7th February 2014: a draft of the modified excise tax law => carbonated non-alcoholic drink subject to excise tax
- ❖ **The economic impact of the excise tax imposition on the soft drink industry in Vietnam?**

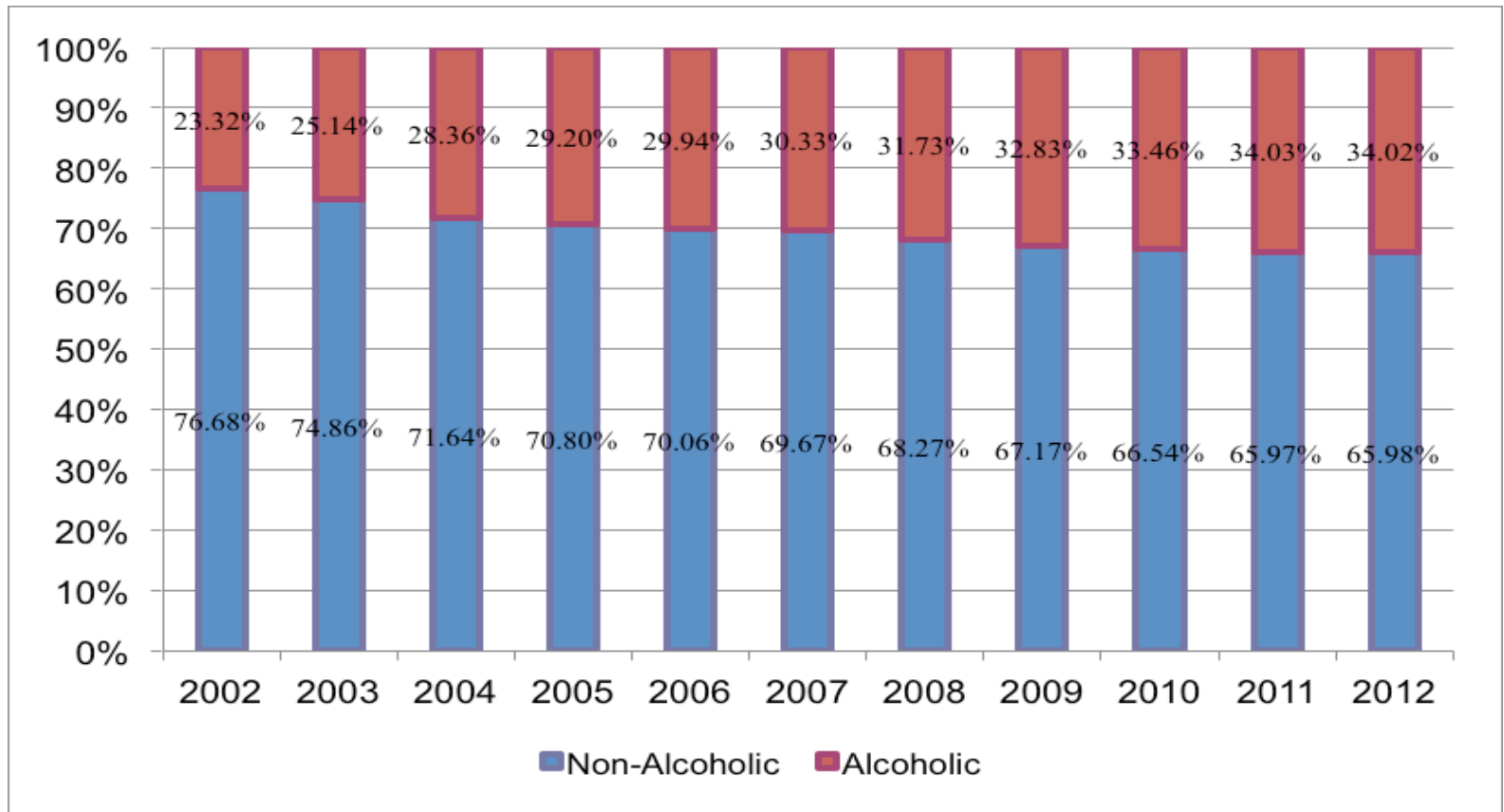
Soft drink industry in Vietnam

I. Overview

- ❖ A potential market for soft drinks: population (2011: 87.6 million, increase 1%/year), GDP per capital (1,300USD/year),...
- ❖ A highly competed with the presence of multiple players: 134 enterprises (FDI and domestic enterprises)
- ❖ The rapid development of domestic enterprises
- ❖ Average growth rate: 16.73% (2008-2013)
- ❖ Food and drink sector: VNR500 2013 => ranked 4th in revenue, 2nd in average ROA, 3rd in average ROE); contribute 15% to GDP

2. The structure of the Vietnam soft drink industry

Figure 1: Structure of Vietnam soft drink industry



2. The structure of the Vietnam soft drink industry

❖ Non-Alcoholic Drink

The volume structure: be more diversified

- Share of tea and coffee: ↓. Tea: 50.15% (2002) down to 39.97% (2012). Coffee: 15.3% (2002) down to 8.87% (2012).
- The share of Ready-To- Drink (RTD): ↑. RTD Tea: 30.84% (2002) to 52.26% (2012). RTD Coffee: 32.09% (2002) to 45.95% (2012).
- Dairy/soy beverages: 17.12% (2002) up to 21% (2012) => the efficiency of the National Strategy on Nutrition

The value structure: tea, coffee, dairy/soy beverages => main products (2012: 72.95% of non-alcoholic drinks)

The price change: increase 6.2%/year. Core sparkling drinks (↑ 8%/year), Juice drinks (↑ 6.4%/year)

2. The structure of the Vietnam soft drink industry

❖ Alcoholic Drinks

The volume structure:

- Dominated by beer: (93.73% in 2012, ↑ 10.37%/year in 2002-2012)
- The others Alcoholic Drinks: ↑ slowly (5.8%/year in 2002-2012). 2012: 40.5 million units, go up 2.8%)

The value structure: beer take most of the market

(93.73% in 2012, increase 17.22%/year in 2008-2012). 2012: US\$ 5,870.6mn, go up 18.14%. The others Alcoholic Drinks: ↑ 9.7%/year in 2008-2012.

Methodology and approaches

1. Price elasticity approaches: $E_d = (\Delta Q/Q) / (\Delta P/P)$

E_d : price elasticity of demand, $\Delta Q/Q$: percentage change of demand and $\Delta P/P$: percentage change of price

⇒ $E_d=0$: Perfectly inelastic demand; $-1 < E_d < 0$: Inelastic or relatively inelastic demand; $E_d=-1$: Unit elastic, unit elasticity, unitary elasticity, or unitarily elastic demand; $-0 < E_d < -1$: Elastic or relatively elastic demand; $E_d=-\infty$: Perfectly elastic demand

⇒ Affect revenue or output of a commodity

2. Excise tax and its impact: depend on the price elasticity of demand for those goods and services. The cost of consumers and producers for the application of excise tax

Methodology and approaches

3. An empirical approach to elasticity measurement

Functional form: $\ln Y = \beta_1 + \beta_2 \ln X$

$$\ln Y = \beta_1 + \beta_2 \ln P + \beta_3 \ln X_1 + \dots + \beta_n \ln X_n + \alpha_m \ln(X_p X_q) + e$$

The slope parameter is a direct measure of elasticity

=>

Y: the quantity demanded, P: price, X1 to X2: control variables, interaction between control variables, e: residual

Database: monthly volumes and values of soft drinks sold in the market of the **6 largest cities/provinces** (Hanoi, HCM city, Da Nang, Can Tho, Hai Phong, Nha Trang) in Vietnam in the period from 2007 to 2013 provided by professional market research company – Canadean.

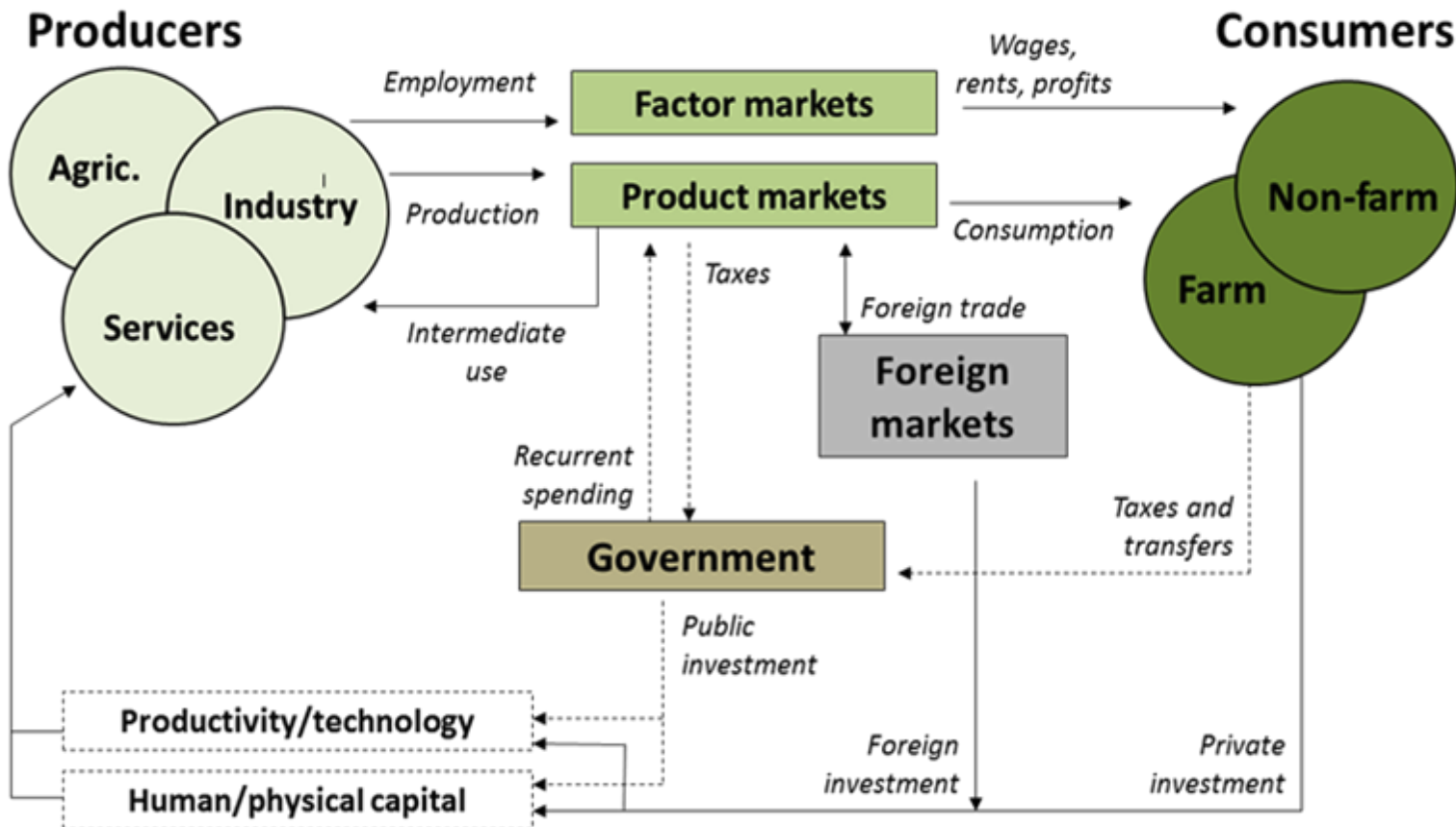
Methodology and approaches

4. General equilibrium approach

- ❖ CGE (Computable General Equilibrium) approach: analyze the impacts of industrial and sector-level policies
- ❖ Constant returns to scale; Intermediate demand: fixed technology coefficients; constant elasticity of substitution (CES) production functions allow factor substitution based on relative prices

Methodology and approaches

Conceptual Framework for the Economy-wide Model



Methodology and approaches

- ❖ Substitution possibilities exist between production for the domestic and the foreign markets. The small-country assumption
- ❖ The model distinguishes between 30 representative households that are disaggregated across the two sub-national regions (i.e., Mekong Delta and RoV), by farm/nonfarm, fish/crop-only farms, and by per capita expenditure quintiles.
- ❖ Three broad macroeconomic accounts: the government balance, the current account, and the savings-investment account
- ❖ Calibrated to the 2011 social accounting matrix (SAM) (update from 2007)

Impact of excise duty imposition

I. Empirical results: impact on the industry

The relationship of quantity demanded and prices of other drinks. E.g. Sparkling soft drink and its price. The regression results:

$$Y_{SSD} = -2.81 * P_{SSD} + 0.0009 * dGDP + 3.98 * P_{ED} - \\ 0.96 * P_{FJ} - 1.98 * P_{PW} - 0.55 * P_{SM} + 1.81 * PP_{SSDED}$$

Y: the quantity demanded of sparkling s ; dGDP: growth of GDP (increase in income of customers); P_{ED}, P_{FJ}, P_{PW}, P_{SM}: price of energy drink, fruit juice, packaged water, soya milk; PP_{SSDED}: the interaction between its own price and price of energy drink

⇒ Carbonated soft drinks: sensitive with the change in price. Price ↑ 1% ⇒ Demand ↓ 2.8%.

⇒ **Excise Tax Rate ↑ 10% ⇒ Demand ↓ 28%**

I. Empirical results: impact on the industry

Table: Effects of Excise Tax of 10% on Carbonated Soft Drinks in 6 largest cities/provinces

No	Items	Carbonated soft drink
1	Price elasticity of carbonated soft drinks	-2.8
2	The quantity average demand in 2013 ('000 units)	3,927
3	Average sale value in 2013 (million vnd)	470,822
4	Total sale value in 2013 (million vnd)	5,649,864
5	Average price of carbonated soft drinks ('000 vnd)	120
6	Proposed excise tax rate on carbonated soft drinks (%)	10
7	Price after excise tax	129
8	Quantity of carbonated drinks after excise imposition ('000 units)	3,102
9	Loss/gain of quantity demanded of carbonated drinks ('000 units)	-825
10	Average sale value after excise imposition (million vnd)	399,846
11	Loss/profit in a month (million vnd)	-70,976
12	Loss/profit in a year (million vnd)	-851,717

2. Empirical results: impact on the economy

Table: Vietnam in 2011

Items	Value
GDP by current price (billion VND)	2,535,008
Structure of GDP (%)	
Agriculture, forestry and fishing	22.02
Industry and construction	40.79
Service	37.19
GDP by expenditure category at current prices (billion VND)	2,535,008
GDP by expenditure category at current prices (%)	
Gross capital formation	32.63
Gross fixed capital formation	29.41
Changes in stocks	3.22
Final consumption	70.79
State	6.48
Private	64.31
Trade balance (goods & services)	-4.22
Statistical discrepancy	0.8

2. Empirical results: impact on the economy

- ❖ Excise tax on carbonated soft drinks 10% \Rightarrow demand \downarrow
 \Rightarrow output and production of the industry \downarrow \Rightarrow
customers and suppliers \downarrow , income of household \downarrow
- ❖ Excise tax on carbonated soft drinks (**imposed on
factory prices**) 10% \Rightarrow quantity of domestic
productions soft drinks \downarrow 0.58%, GDP \downarrow 0.010% (US\$
12.1 mn)

2. Empirical results: impact on the economy

- 3. Empirical results: impact on the Government budget

No	Government budget components (million VND)	Carbonated soft drink
1	Increase in government revenue due to excise tax imposition	396,541
2	The loss of value added tax revenue	-85,172
3	The loss of enterprise income tax	-77,105
4	Government revenue (revenue subtracted by losses)	234,264

- **Excise tax imposed on factory price: CGE approach:** GDP ↓ US \$ 12.1 mn => Government revenue ↓ US\$ 2.7 mn (VND 56.5 billion) => Total government revenue will **increase US\$ 8.46 mn**

Comparision with Indonesia case

A similar but more comprehensive study on Indonesia shows that, imposition of excise tax on carbonated drinks of RP 3,000 (equivalent to increase in price of 37,8%) will result in the following impacts

Decrease in soft drink industry revenues	Rp. 5.6 trillion	US\$ 487.2 mn
Decrease in government revenue	Rp. 783.4 billion	US\$ 68.2 mn
Decline in GDP	Rp. 12.2 trillion	US\$ 1,061.4 mn
Decrease in wage and salary income	Rp. 1.56 trillion	US\$ 135.7 mn

Conclusion

- ❖ ***Economic impact of excise tax imposed on non-alcoholic soft drink:***
 - Government revenue increase by 8.46 million
 - Soft drink industry revenue loss of **USD 40.5 million** (VND 851 billion)
 - USD 12.1 million (VND 253.5 billion) loss to other sectors
 - Other negative impacts: employment effect, income effect, influence on other drinks, cost of running a system of excise tax collection
 - The imposition of excise tax on carbonated soft drink is questionable economically.



Thank you!



Central Institute for Economic Management

**SOFT DRINK INDUSTRY AND THE ECONOMIC
IMPACT OF EXCISE TAX ON NON-ALCOHOLIC
CARBONATED SOFT DRINK IN VIETNAM**

Hanoi, April 2014

Preface

Soft drink industry in Vietnam has been expanding rapidly in the past decades. The expansion of the industry benefits from higher living standards of the population as a result of rapid economic development since the implementation of open door policy. It also results from young population who adopts modern life styles and enjoys economic development of the country. On the other hand, the industry has contributed significantly to the job creation, the economy and the state budget.

This report is aimed at measuring the impact of the proposed excise tax on the non-alcoholic carbonated soft drink industry in Vietnam. The excise tax imposition on the non-alcoholic carbonated soft drink industry is proposed by the Ministry of Finance in the 7th February 2014. The excise tax law draft is now in discussion at the Government and opened for contribution of stakeholders. This report is conducted to contribute empirical evidences to the discussion to ensure that all possible aspects of the imposition of the excise tax such as efficiency, effectiveness, fairness, and international practice of the taxation regime should be considered.

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Abbreviations

APB	:	Asia Pacific Breweries
BMI	:	Business Monitor International
CES	:	Constant Elasticity of Substitution
CGE	:	Computable General Equilibrium
CIEM	:	Central Institutions for Economic Management
FDI	:	Foreign Direct Investment
GAMS	:	General Algebraic Modelling System
GDP	:	Gross Domestic Product
GSO	:	General Statistic Office
Habeco	:	Hanoi Alcohol Beer and Beverage Company
MOF	:	Ministry of Finance
NRTD	:	Not-Ready-To- Drink
RoV	:	Rest of Vietnam
RTD	:	Ready-To-Drink
Sabeco	:	Saigon Beer Alcohol Beverage Corporation
SAM	:	Social Accounting Matrix
SMS	:	Short Message Service
USD	:	US Dollar
VHLSS	:	Vietnam Household Living Standard Survey
Vinamilk	:	Vietnam Milk Joint Stock
VND	:	Vietnam Dong
VNR500	:	Vietnam Report 500
WTO	:	World Trade Organization

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Introduction

Excise tax is a special duty that is applied to several commodities and services which carry negative externalities to change the consumption behaviour, reduce such negative externalities and raise state revenue. In Vietnam, the Law on Excise Tax was ratified by the National Assembly firstly in 1990, then in 1998 and 2008 with several modifications in 1993, 1995, 2003 and 2005. This law, as described by the Ministry of Finance (MOF), contributed to the development of the country, orienting production and consumption pattern of the society, mobilizing reasonably consumer's income for the state budget. Moreover, excise tax is seen as a tool of the government given the commitments of the country with WTO.

There are 16 groups of commodities included in the current excise tax base.¹ The MOF in 7th February 2014 submitted a modified draft of the current excise tax law, in which the following commodities are being included: (i) pride-awarded short-message-services (SMS), (ii) non-alcoholic carbonated soft drink. The modified draft of the excise tax law also proposed to increase tax rates with other commodities and services and to change the article on types of gasoline. While explanation for applying pride-awarded SMS is that it is seen as a type of gambling which is not included in previous law, the imposition of excise tax on carbonated non-alcoholic drink is seen as a measure to control its negative externalities (i.e., obesity, cholesterol, diabetes, gout and increased risk of cancer). Even though these negative externalities are in discussion, they are not the main focus of this paper. This study aims at looking for the economic impact of the excise tax imposition on the non-alcoholic carbonated soft drink industry in Vietnam.

The study follows a partial impact approach to analyze the influence of excise tax imposition on carbonated soft drink industry. By applying price elasticity analysis, we look for the impact of excise tax imposition on the government revenue and industry output as well as general impact on GDP. This analysis is followed by an impact analysis on the economy as a whole. To this end, the study utilizes the CGE (Computable General Equilibrium) model which allows us to simulate the impact of change in government sector (increasing revenue by applying excise tax on non-alcoholic carbonated soft drink) to the production sector of the economy.

¹Please see the Annex III for tax base and tax rate of excise tax

Due to data unavailability, comprehensive review of economic impacts on other parameters of the economy such as impact on industry's income tax contribution as well as employment and impact on income tax of people employed by the industry directly and indirectly are not computable. However, as industry output is likely to decline due to tax imposition, it is anticipated that such tax imposition will also yield negative impact on such parameters as well.

With this research strategy in mind, the report is structured as follows. The next section will describe briefly about the soft drink industry in Vietnam. Section three is devoted for the discussion on methodology and approaches used in this study. In this section, discussion of price elasticity approach and general equilibrium approach will be presented. Data used in this study is also described in this section. The next section discusses results of the empirical analysis and impact of excise tax imposition on the industry, government budget and the economy. The conclusion section will summarize main findings of the study.

Soft drink industry in Vietnam

An overview

The beverage industry in Vietnam has existed for a long time and has been expanding more quickly over the past decades. The development of the industry was supported by foreign investment and the catch-up development of the domestic producers recently. In 1994, Coca-Cola constructed their first plant and has achieved high growth since then. In 1991 Pepsi Co also entered in Vietnam's market under a joint venture and continues to have strong presence in Vietnam nowadays. In a similar but later move, a giant of the world beverage sector, Nestle, plans to increase its coffee sourcing from local farmers in Vietnam and has committed to a new coffee plant in the country. The US\$ 270 million plant will be constructed in the south-east province of Dong Nai and will produce Nescafe-branded products for the domestic and international markets from 2013.² Products of the beverage sector are diversified with high quality meet consumers' demand.³ The industry has contributed significantly to the economy. At this stage, the food and beverage industry contributes about 15% of GDP and its share is increasing.

The reason for such achievement in the beverage sector along with the expansion in production capacity is the young population with improving living standards within the country. In 2011, Vietnam's population reached 87.6 million, with an average growth rate of about 1%. 81.9% of the population is under the age of 50 years old. In the past decades the country has achieved rapid growth and is now classified as a low-middle income country with GDP per capital of 1,300 USD (approximately 27 million VND) in 2012.

In beverage industry, soft drink sector account for substantial proportion of the beverage industry and is one of the most efficient sectors of Vietnam. Among the 500 largest enterprises as reported by VNR500 of 2013, food and drink sector is one of the top five (ranked 4th in revenue, 2nd in average ROA, 3rd in average ROE).⁴

² BMI (2013), Vietnam food and drink report Q2 2013. p.51.

³For example, there are 11 labels on the packaged water market, include: Lavie, Joy, A&B, Aquafina, number one, Da kai, Viltal, VĩnhHảo, Thạchbích, Kim bôi, Suốimơ.

⁴ Vietnamnet.vn (2014). The food & drink sector is shined by the competition. <http://vietnamnet.vn/vn/kinh-te/156350/nganh-thuc-pham---do-uong--toa--sa-ng-tu-canh-tranh.html>. Assessed by 8/3/2014.

Manufacturing enterprises on the beverages industry

In term of number of enterprises, the beverages industry has been expanding substantially (see Table 2). In the period from 2005-2011 the number of enterprises in beverages industry has increased from 762 to 1741 at the average growth rate of 14.7%. Most importantly, newly established enterprises are mainly in non-alcoholic sector. The average growth rate of non-alcoholic enterprises in the period 2005-2011 is 17.3%, accounting for 82.4% of total enterprises in 2011.

Table 1. Manufacturing enterprises on the soft industry in the period 2000-2011

	Number of enterprises			Enterprises distribution			Average growth rate (%)	
	2000	2005	2011	2000	2005	2011	2001-2005	2006-2011
Alcohol	150	210	306	26.8%	27.6%	17.6%	8.00%	9.14%
Non-Alcohol	410	552	1435	73.2%	72.4%	82.4%	6.13%	17.26%
Total	560	762	1741	100%	100%	100%	6.35%	14.76%

Source: Phan Hữu Thắng (2014), Overview of food and beverage industry, presentation at the forum: Prospects of the food and beverage industry in Vietnam. Hanoi, March 28th 2014.

The beverages industry in Vietnam also witnesses rapid development of domestic enterprises. They are now playing a more important role and gradually take control of important parts of the market. Domestic enterprises accounts for 93.7% of total number of beverages enterprises in 2011. In which, non-state of enterprises account for 85% of total number of manufacturing enterprises on the industry. Some of them become key players in the markets such as Vinamilk, Trung Nguyen, Tang Hiep Phat, Tribeco,... The domestic enterprises are gradually increasing strength and presence controlling different parts of the soft drink market and expand to the region. In the case of Tan Hiep Phat, for example, they control still packaged RTD Tea by different branches, i.e. 0⁰ green tea, Dr. Thanh tea, etc. Another example in beer sector is Saigon Beer (Sabeco), Hanoi Beer (Habeco) which gradually grasped the market from Chinese beer (VạnLực Beer) and now dominates the market.

Table 2. Key players in Vietnam's beverages sector

Companies	Sub-sector	Sales (VND bn)	Sales (US\$mn)	Year Ending	Employees	Year Est.
Coca-Cola	Vietnam Beverages - Soft drinks	na	180.0 (e)	2011	1,182	1994
Habeco	Beverages - Alcoholic	3,416	165.4	2011	na	na
Hanoi Milk JSC	Food and beverages - Dairy	282	13.5	2011	na	2001
Nestlé Vietnam	Food and beverages	827.1	40.0	2011	na	1995
Pepsi-IBC Vietnam	Beverages - Soft drinks	na	145.0 (e)	2011	na	1991
Sabeco	Beverages - Alcoholic	24,332	1,178.1	2011	na	na
Tribeco	Beverages - Soft drinks	742	35.9	2011	1,250	1992
San Miguel Purefoods Vietnam	Food and beverages - Miscellaneous	na	105.0 (e)	2011	na	na
Tan Hiep Phat Group	Beverages - Alcoholic & Soft	na	25.8 (e)	2011	2,000+	1994
Trung Nguyen Corp	Beverages - Coffee	na	129.0 (e)	2011	na	1996
Unilever Vietnam	Food and beverages	EUR18.9bn*	24,692.9	2011	5,500	1995
Vietnam Brewery Ltd	Beverages - Alcoholic	na	155.0 (e)	2011	500	1991
Vinacafe Bienhoa JSC	Beverages - hot drinks	na	30.9 (e)	2011	na	1969
Vinamilk	Beverages - Dairy	26,500 (e)	na	2012	3,000	1976

Source: BMI (2013), Vietnam: Food and Drink report Q2 2013.

Box 1: The global aspirations of Vinamilk

Established in 1976, today Vinamilk (Vietnam Dairy Products JSC.) is the biggest company in beverage sector, ranked 2nd of the top 500 Vietnamese largest private companies (VNR500) in 2013. The company accounts for 70% Vietnam's dairy market, making total revenue of VND 27,102 billion and average growth rate of 34% in the period 2008-2012. In 2012, profit before tax was 6,930 billion dong, grown 50% per year in the period 2008-2012. In 2010, the company was honoured and awarded to the Top 200 best Asia enterprises in 2012 of prize by Forbes Asia. It is the first time a Vietnamese company was awarded the Prize of Forbes Asia. At the same time, the company realized its plan of investment abroad by investing US\$ 8.475mn to a dairy processing factory in New Zealand. The company targets USD 3 billion revenue and the 1st position in the biggest 50 dairy enterprises in the world.

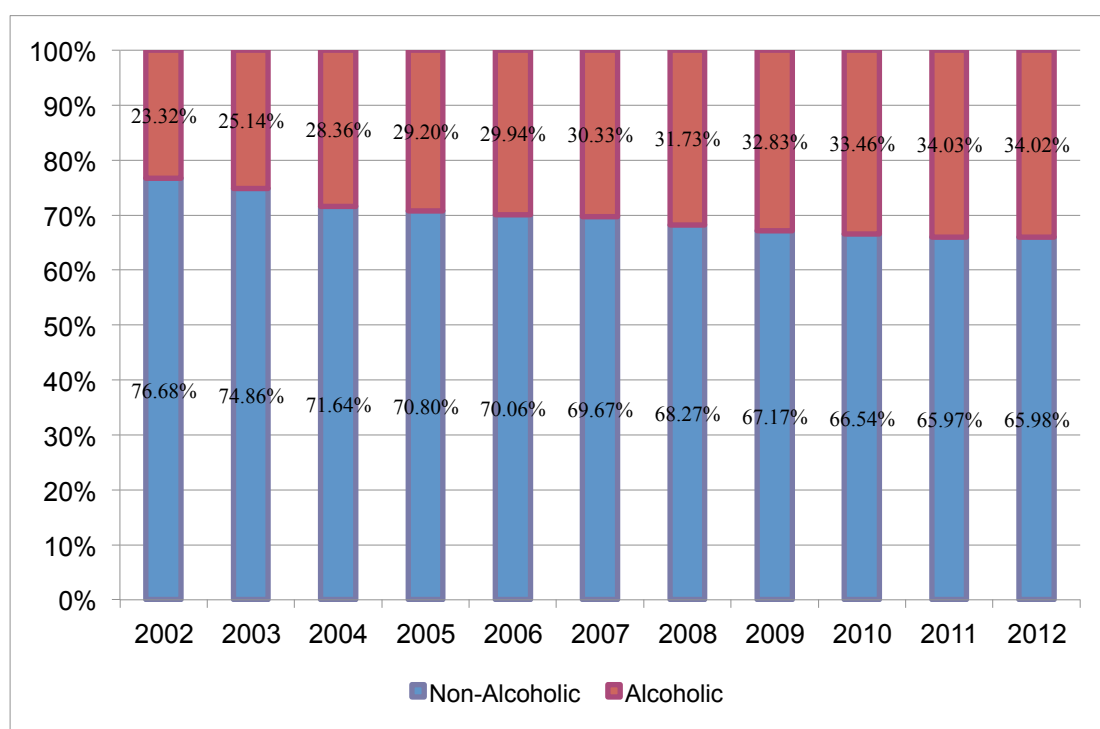
Source: Vinamilk, 2012, The annual report 2012

The structure of the Vietnam beverages industry

The structure of beverages industry in Vietnam includes non-alcoholic drinks & alcoholic drinks. During the period 2002-2012, in term of volume, non-alcoholic drinks gradually went down, along with the increase of alcoholic drinks. Non-alcoholic drinks accounted for 65.86% in 2012, lower than 76.86% in 2002. At the same time, the percentage of alcoholic drinks increased from 23.14% to 34.14%. Alcoholic drinks increased by slower rate as a result of the application of excise tax since 2008. In term of value, however, during the period 2008-2012 there is not much change in the structure of the industry.

Prices of non-alcoholic drinks increased recently. In the last few years, average price of non-alcoholic drinks increased by 7.8% and price increase reached 14% in 2011. By comparison, the price of alcoholic drinks increased by an average of 5% in the same period, with the lowest 3% in 2009 to 8% in 2012.

Figure 1. Structure of Vietnam soft drink industry



Source: Canadean Ltd.

Non-alcoholic soft drinks

Non-alcoholic soft drinks includes packaged water, sparkling (carbonated) drinks, juice drinks, sport drinks, energy drinks, tea, coffee, dairy/soy drinks,

and other non-alcoholic drinks. During the period 2002-2012 substantial changes in soft drink sector happened largely in tea and coffee. These were main types of drinks in Vietnam previously. In 2002, tea, coffee and dairy/soy beverages accounted for up to 82.6% of non-alcoholic drinks in term of volume, in which tea accounted for more than 50%. The share of tea, coffee and dairy/soy beverages reduced considerably in the aforementioned period. The share of tea decreased to 41.91% in 2008 and 39.92% in 2012. Similarly, the share of coffee went down from 15.3% in 2002 to 11.99% in 2008 and 8.87% in 2012.

At the same time, share of dairy/soy drinks increased from 17.12% in 2002 to 21.59% in 2006 and was 21% to 2012. This increase in the dairy/soy drinks is seen as main achievement of the National Strategy on Nutrition in the period 2000-2010, which aims at raising the consume of dairy drinks of the people.⁵

Table 3. The volume structure of non-alcoholic soft drinks (both RTD and NRTD), 2002-2012 (%)

Items	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Packaged Water	3.29	3.79	4.85	5.71	6.57	7.01	6.92	8.02	8.36	8.60	9.00
Sparkling (carbonated) drinks	5.76	5.33	5.38	5.65	6.27	6.78	7.32	7.53	8.30	8.38	8.48
Juice & Juice Drinks	0.65	0.67	0.89	1.06	1.51	1.60	1.69	1.78	1.87	1.86	1.80
Sports drinks	0.02	0.02	0.03	0.07	0.07	0.09	0.05	0.05	0.16	0.28	0.36
Energy drinks	2.94	3.11	3.77	4.10	4.73	5.24	4.06	4.91	5.19	5.53	6.29
Tea	50.15	48.48	48.43	47.48	44.71	41.60	41.91	42.01	41.12	40.59	39.97
Coffee	15.33	15.20	15.33	13.71	13.21	12.44	11.99	10.04	9.67	9.35	8.87
Dairy/Soy drinks	17.12	18.52	19.84	21.25	21.70	20.97	21.59	21.23	21.23	21.48	21.55
Other non-alcoholic drinks	4.74	4.87	1.49	0.97	1.25	4.27	4.47	4.43	4.11	3.94	3.68

Source: Authors's estimation from data provided by Canadean Ltd.

⁵ The National Strategy on Nutrition aim at the target that in 2015 Vietnamese consumes 1.9 billion litter of dairy drinks, estimates average 21 litter/person per year. In 2025, the total dairy drinks reach 3.4 billion litter, estimating average 34 litter/person per year (Source:<http://www.dairyvietnam.com/vn/Sua-Viet-Nam/Co-hoi-phan-trien-cho-nganh-sua-Viet-Nam.html>, assessed by 09/3/2014)

Considering market structure of tea, coffee and dairy/soy drinks in 2002 in term of type of readiness, ready-to-drinks (RTD) accounted for small share (31%, 32%, 45.71% respectively)⁶ of the total RTD and NRTD beverages. However, share of RTDs increased over time in the last decade. Share of RTD tea increased sharply from 30.84% in 2002 to 52.26% in 2012. This shows a dramatic change in the preference of the population on RTD tea. There are many brands of RTD tea nowadays such as 0⁰ green tea, C2 tea, etc.⁷ The share of RTD coffee raised at slower pace than one of RTD tea⁸ (in 2012, the share of RTD coffee was 45.95%, went up 13.86% compared to 2002). Beside, since 2010, the proportion of RTD tea has gone down slowly (reached 46.67% in 2010, down to 46.43 in 2011, to 45.95% in 2012). Concerning non-alcoholic Not-Ready-To-Drinks (NRTD) beverages, there is unclear trend. In comparison with NRTD, the proportion of RTD dairy/soy beverages⁹ is increasing¹⁰.

With the improvement in living standards, the soft drinks market developed strongly and is more diversified. The share of the other non- alcoholic drinks also has been increased. Energy drinks for example, increased their share from 2.94% in 2002 to 6.29% in 2012. Sparkling drink, packaged water show the same trend of increase.

Table 4. The value structure of non-alcoholic soft drink, 2008-2012 (%)

Items	2008	2009	2010	2011	2012
Packaged Water	4.05	4.36	4.64	4.53	4.70
Sparkling (carbonated) beverages	8.38	8.50	9.22	10.43	10.35
Juice & Juice Drinks	2.21	2.33	2.46	2.67	2.55
Sports beverages	0.06	0.06	0.16	0.23	0.31
Energy drinks	5.91	6.91	7.10	6.82	8.19
Tea	27.15	29.12	29.24	29.10	29.72

⁶ The figures in this section, if not otherwise stated, are estimated from the data provided by Canadean Ltd.

⁷ Average annual growth rate of packaged tea was 300%/year in 2005-2012 (from 5.2 million units in 2005 to 130.5 million units in 2012). Meanwhile, unpackaged tea increased only 3.36%/year in the same period. The impressive growth of packaged tea was the main reason to increase quickly the share of RTD of tea.

⁸ RTD coffee is unpackaged coffee (97.76% in 2012). Packaged coffee only joined the market since 2008, and their volume is very small. In 2012, their volume was only 0.6 million units.

⁹ RTD dairy/soy beverages mainly are unflavored dairy and unflavored soy beverages (accounted for 67% and 98.4% of the volume of each).

¹⁰ Even though the increase is very small increase (about 1.1% from 2002 to 2012)

Items	2008	2009	2010	2011	2012
Coffee	20.34	17.05	15.85	16.26	15.15
Dairy/Soy beverages	25.46	25.48	25.87	24.17	23.77
Other non-alcoholic beverages	6.45	6.19	5.46	5.79	5.28

Source: Authors's estimation from data provided by Canadean Ltd.

In term of value, table 4 shows that, tea, coffee and dairy/soy drinks are the main products in the market. In 2008, tea, coffee and dairy/soy drinks altogether contributed 72.95% of the market value of non-alcoholic drinks. The share of tea, coffee and dairy/soy drinks has decreased in the last few years, reaching at 68.64% of the market value of non-alcoholic drinks in 2012.

In term of price change, from 2008-2013 price change of core sparkling drinks is highest at 8% per year. Most of price changes happened in 2011. Juice drinks price increased second after core sparkling drinks at the average of 6.4% per year during the same period. In general, non-alcoholic drinks price increased by 6.2% per year during the period 2008-2012. This level does not keep up with the change in inflation of the country at the same period.

Table 5. Average price and change in prices of non-alcoholic drinks, 2008-2012 (USD/unit, %)

	2008	2009		2010		2011		2012		2008-2012	
	Price	Price	Up	Price	Up	Price	Up	Price	Up	Price	Up
Packaged Water	2.4	2.4	-1.6%	2.6	9.3%	2.8	8.2%	2.8	0.9%	2.6	3.5%
Core sparkling beverages	4.7	4.9	4.5%	5.1	5.2%	6.6	27.9%	6.5	-0.5%	5.6	8.0%
Juice & Juice Drinks	6.7	6.9	3.5%	7.1	3.1%	8.8	23.3%	8.8	0.4%	7.6	6.4%
Sports beverages	4.4	4.6	3.9%	4.8	3.7%	4.4	-7.2%	4.6	3.2%	4.6	0.6%
Energy drinks	5.9	6.1	2.4%	6.3	3.8%	6.5	3.1%	7.0	7.3%	6.4	3.5%
Tea	6.9	6.5	-6.1%	6.6	2.5%	7.4	12.1%	7.6	2.8%	7.0	2.2%
Coffee	17.7	16.4	-7.5%	16.3	-0.5%	19.8	21.8%	20.0	0.8%	18.0	2.6%
Dairy/Soy beverages	10.3	11.4	10.5%	12.2	7.4%	12.8	5.1%	12.7	-1.3%	11.9	4.6%
Other non-alcoholic beverages	5.9	6.1	2.5%	6.2	1.9%	7.8	26.2%	7.7	-0.7%	6.7	6.2%
Non-alcoholic beverages	4.1	4.4	5.8%	4.7	6.9%	5.3	14.0%	5.4	1.8%	4.8	6.3%

Source: Authors's estimation from data provided by Canadean Ltd.

In term of non-alcoholic carbonated soft drinks, this sector has experienced dramatic changes in the past decades. The number of enterprises in the sector has increased from 410 in 2000 to 1,435 in 2011. The share of number of enterprises operating in non-alcoholic carbonated soft drinks in total enterprises of beverage industry has increased from 73.2% in 2000 to 82.4% in 2011. The share of number of foreign invested enterprises in the industry is small compared to SOEs and domestic private enterprises. However, it has increased from 1.7% in 2000 to 6.3% in 2011. Foreign invested enterprises accounted for 18.7% of non-alcoholic soft drinks in 2000. This figure has increased to 30.1% in 2011.¹¹

Table 6. Share of enterprises in carbonated soft drinks category

Name	Share (%)		
	2011	2012	2013
Pepsi	54%	54%	56%
Coca-Cola	28%	30%	29%
THP	3%	2%	3%
Others	15%	14%	12%

Source: Nielsen RMS NTW

Within carbonated soft drinks category, foreign invested enterprises account for 82% share of this category in 2011 & increased to 85% in 2013.

Alcoholic drinks

Alcoholic beverages include beer and the other alcoholic beverages (flavored alcoholic beverages¹² and other alcoholic beverages). In Vietnam, alcoholic drinks are subject to excise tax. According to the law on excise tax 2008, from 1/1/2010 to 31/12/2012, the excise tax rate on alcohol of over 20⁰ is 45%; on beer, the rate is 45%. Since 1/1/2013, the rate on alcohol of over 20⁰ is 50%; the rate on beer is 50%.

Beers dominate the alcoholic drink market in Vietnam. The share of beer in total volume of alcoholic drink gradually increased in 2002-2012, and

¹¹ PhanHữuThắng (2014), Overview of food and beverage industry. The forum: Prospects of the food and beverage industry in Vietnam. Hà Nội, March 28th 2014.

¹²Flavored Alcoholic Beverages accounted for a very small share of volume, compared to other alcoholic beverages. In 2012, reached only 0.3 million units (0.04%).

accounted for 93.73% in 2012 (604.9 million units). Average annual growth rate of beer was 10.37% in the period 2002-2012, higher than the growth rate of alcoholic beverages. Compared with beer, the volume of other alcoholic beverages increased slowly. Average annual growth rate was only 5.8%, keeping closely pace with the growth of the economy. In 2012, the growth rate of the other alcoholic beverages was 2.8%, reached 40.5 million units.

Considering the structure of alcoholic drinks value, beer takes most of the market, too. The share of beer in total alcoholic drink market value increased from 91.98% in 2008 to 93.73% in 2012. Average annual growth rate of beer reached 17.22% in 2008-2012. Given the situation of the economy in the period from 2008-2012, this growth rate is a great achievement for beer producers and importers. In 2012, beer value increased 18.14%, reached US\$ 5,870.6 million. Average annual growth rate of the other alcoholic beverages reached only 9.7%/year (Table 7).

Table 7. Alcoholic drink market value structure, 2008-2012 (%)

	2008	2009	2010	2011	2012
Beer	91.98	92.47	92.98	93.38	93.73
Total Other Alcoholic Drinks	8.02	7.53	7.02	6.62	6.27

Source: Canadean Ltd.

Box 2: The beer sector of Vietnam

Domestically produced international brands include Heineken, Fosters, Tiger, Carlsberg and San Miguel, in which the first three produced by Asia Pacific Breweries (APB). APB has brewing facilities in 13 different high growth markets- Singapore, Malaysia, China, India, Vietnam, Thailand, etc. Its flagship product is its Tiger beer brand. A number of foreign players have invested in the Vietnamese market, including the Danish major Carlsberg (operating both alone and via a joint venture with Habeco); UK spirits leader Diageo (operating both alone and through a partnership with Halico); etc.

In spite of the growing presence of multinationals in the market, local firms continue to dominate. The sector remains highly-regionalised, with Habeco (Hanoi Alcohol Beer and Beverage Company) dominating the north of the country and Sabeco (Saigon Beer Alcohol Beverage Corporation) being the key player in the south. Sabeco and Habeco- both state-backed brewers- control an impressive 34% and 19% of the local beer market respectively. Therefore, domestic brands continue to lead overall sales in the Vietnamese beer market.

Source: BMI (2013), Vietnam: food and drink report Q2 2013.

In term of volume, household-made spirit accounts for a large share of alcoholic drinks. Table 8 shows the volume and share of other alcoholic drinks in the period 2000-2011. The share of household-made spirit is the largest, but falling steadily. Despite of this falling, household-made spirit still account for over 76% in 2011. The share of pure spirit stronger than 25 degree increases by 11.9 percentage points from 3.76% in 2000 to 15.7% in 2011. Others also increase by small percentage.

Table 8. The volume structure of other alcoholic drinks in 2000-2011

	Volume			Share (%)		
	2000	2005	2011	2000	2005	2011
Spirit stronger than 25 degree	4.7	13.1	52.6	3.76	5.93	15.7
Liqueur	3.5	2.1	6.8	2.85	0.96	2.1
Champagne	0.3	0.3	1.0	0.24	0.13	0.3
Wine from fresh fruits	6.3	8.6	16.8	5.08	3.91	5.2
Household-made spirit	109.3	196.9	248.7	88.07	89.07	76.8
Total	124.2	221.1	322.6	100	100	100

Source: Phan Hữu Thắng (2014), Overview of food and beverage industry. The forum: Prospects of the food and beverage industry in Vietnam. Hà Nội, March 28th 2014.

Methodology and approaches

Price elasticity approach

Economics law tells us that, all else equal, when the price of a particular good falls, the quantity demanded for that good rises. The law tells us a negative relationship between price of and demand for a good but does not tell us the magnitude of this relationship. This magnitude is measured based on the concept of price elasticity, which reveals the degree of sensitivity of demand for a good to the change in its price. Specifically elasticity describes the percentage change in demand for a good as a result of one percent change in its price. Mathematically, this relation is shown in the following equation:

$$E_d = \frac{\Delta Q / Q}{\Delta P / P}$$

where E_d is price elasticity of demand, $\Delta Q / Q$ is percentage change of demand and $\Delta P / P$ is percentage change of price.

The demand for one good is not only affected by its own price but also by price of other goods. The nature of the relationship and magnitude of the relationship are revealed by the cross-price elasticity. This indicator refers to the percentage change in the quantity demanded for a good that result from one percentage increased in the price of another good. Mathematically, the cross-price elasticity is shown in the following equation:

$$E_{Q_x P_y} = \frac{(\Delta Q_x / Q_x)}{(\Delta P_y / P_y)} = \frac{P_y}{Q_x} \frac{\Delta Q_x}{\Delta P_y}$$

where $E_{Q_x P_y}$ is the cross-price elasticity of the good X in relation to the change in the price of the good Y. Q_x denotes the quantity of good X, P_y denotes price of good Y. Δ denotes change in quantity and price. The good Y will be called substitute of the good X if the above cross-price elasticity is positive. In other words, an increase in price of good Y will result in an increase the demand for good X. Otherwise it is called complement of good X is the above cross-price elasticity is negative. Or an increase in price of good Y will result in a decrease in the demand for good X.

The following table shows different cases of price elasticity of demand.

Table 9. Elasticity

Value	Descriptive Terms
$E_d = 0$	Perfectly inelastic demand
$-1 < E_d < 0$	Inelastic or relatively inelastic demand
$E_d = -1$	Unit elastic, unit elasticity, unitary elasticity, or unitarily elastic demand
$-\infty < E_d < -1$	Elastic or relatively elastic demand
$E_d = -\infty$	Perfectly elastic demand

Price change can affect revenue or output of a commodity by two channels: (i) the price effect, where an increase in price of an elastic good will result in reduction of revenue (and increase in revenue for inelastic good); (ii) quantity effect, where an increase in price will tend to cause a reduction of quantity demanded for good. The combination of the two effects will define the net effect of a price change on revenue or output of a commodity. The following table summarizes the net effect of price change over the revenue in accordance to the price elasticity of demand of a commodity.

Table 10. Net effects on revenue

Value	Net effects
$E_d = 0$	Changes in the price do not affect the quantity demanded for the good; raising prices will always cause total revenue to increase
$-1 < E_d < 0$	Since price elasticity of demand is relatively inelastic the percentage change in quantity demanded is smaller than that in price. Therefore, total revenue will increase when price rises, and vice versa.
$E_d = -1$	In this case the percentage change in quantity is equal to that in price, so a change in price will not affect total revenue
$-\infty < E_d < -1$	The percentage change in quantity demanded is greater than that

	in price, therefore if price increases, total revenue falls, and vice versa
$E_d = -\infty$	Perfect elasticity means that an increase in price will cause the demand falls to zero, therefore total revenue will fall to zero.

Excise Tax and its impact

While excise tax is used widely in the world today on selective goods and services, a discriminatory excise tax on carbonated soft drinks is uncommon. The government uses excise tax as a mean to raise their budget, collect fees on government services and public goods, control negative externalities whose costs are ignored by producers, and discourage the use of potentially harmful substances. In Vietnam excise tax applied on gasoline, tobacco, liquor and beer contribute a significant part on the government revenue.¹³

The impact of excise tax on the consumption of taxed commodities and services toward the wishes of the government depends on the price elasticity of demand for those goods and services. What the excise tax does is to increase the cost of consumption for a certain good or service and hence affects the consumer's behavior. If demand for a good or service is elastic, an imposition of excise tax will reduce the consumption of that good or service with the magnitude larger than the change in price of that good or service. As a result the government revenue target cannot be obtained, but it can achieve the purpose of reducing the consumer consumption of that specific good or service.

The cost of excise tax does not stop at the consumer level, but can affects sellers by shifting of tax burdens via supply elasticity. The sellers will become main bearers of the excise tax if supply is relative inelastic to price while demand is elastic. Moreover, in a general equilibrium setting the reduction in consumption is finally landed at the production side. And therefore producers will also pay the cost for the application of excise tax by the government.

An empirical approach to elasticity measurement

In this study we assume that relationship between price and quantity demanded of carbonated soft drink is non-linear. To conduct a linear regression analysis, a

¹³ See Annex II for the full list of current commodities and services that are applied excise tax with the tax rates

transformation is applied where the double log models is used. Particularly a log-log model is estimated to establish the demand function of carbonated soft drink. The log-log functional form is as follows:

$$\text{Functional form:} \quad \ln Y = \beta_1 + \beta_2 \ln X$$

For this functional form, the slope parameter is a direct measure of elasticity, i.e, elasticity is $\varepsilon = \beta_2$. From the functional form, an empirical estimation is conducted in the following functional form:

$$\ln Y = \beta_1 + \beta_2 \ln P + \beta_3 \ln X_1 + \dots + \beta_n \ln X_n + \alpha_m \ln(X_p X_q) + e$$

where Y is the quantity demanded, P is price, X1 to Xn is control variables (in this case we analyse the relationship of quantity demanded and prices of other drinks, e.g. fruit juice, energy drink, packed water and soya milk), interaction between control variables, and e is residual.

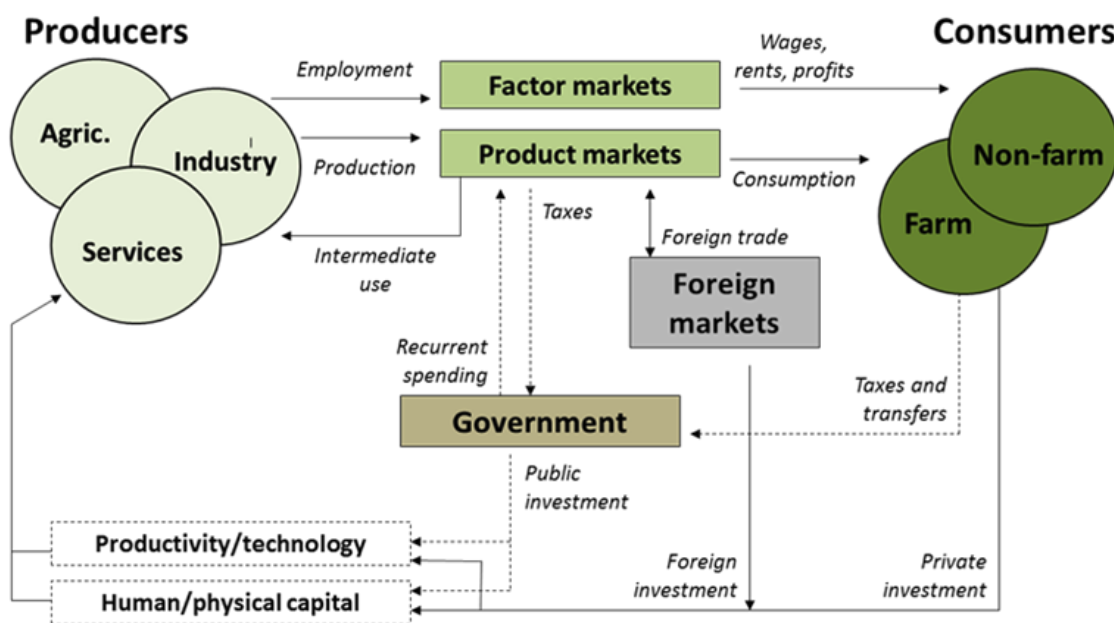
We use a database of monthly volumes and values of soft drinks sold in the market of the 6 largest cities/provinces in Vietnam in the period from 2007 to 2013. The results of empirical estimation is presented and discussion in section 4 of this study.

General equilibrium approach

The price elasticity approach let us see only partially the impact of excise tax imposition on the soft drink industry in Vietnam, i.e. impact on quantity demanded of carbonated soft drink and government revenue from the industry. To analyse the impact on the economy, particularly production side, we use CGE (Computable General Equilibrium) approach. This approach is well-suited to analyzing the impacts of industrial and sector-level policies. First, CGE models simulate the functioning of a market economy, including markets for labour, capital and commodities, and therefore can evaluate how changing economic and natural resource conditions are mediated via prices and markets. Secondly, CGE models ensure that all economy-wide constraints are respected, which is crucial for studies concerned with inter-sectoral linkages or spillover effects. Finally, CGE models contain detailed sector breakdowns and provide a “simulation laboratory” for quantitatively examining how changes in the non beverage drinks influences the performance and structure of the whole economy, particularly in terms of changes in tax rates.

Economic decision-making in the model is the outcome of decentralized optimization by producers and consumers within a coherent economy-wide framework. This is reflected in the conceptual framework for the model presented in Figure below. Production occurs under constant returns to scale. Intermediate demand is determined by fixed technology coefficients (i.e., Leontief demand), while constant elasticity of substitution (CES) production functions allow factor substitution based on relative prices. This means that, for example, as unused crop land in Vietnam becomes scarcer, producers have some ability to substitute land for less scarce factors, such as labour and capital. Profit maximization implies that factors receive income where marginal revenue equals marginal cost. The model identifies 63 sectors where soft drinks stand as a separate sector.

Figure 2. Conceptual Framework for the Economy-wide Model



Substitution possibilities exist between production for the domestic and the foreign markets. This decision of producers is governed by a constant elasticity of transformation function, which distinguishes between exported and domestic goods. Profit maximization drives producers to sell in those markets where they can achieve the highest returns based on domestic and export prices. Further substitution possibilities exist between imported and domestic goods under a CES Armington specification. This takes place in both final and intermediates usage. Under the small-country assumption, world demand and supply is assumed to perfectly elastic at fixed world prices, with the final ratio of traded

to domestic goods being determined by the endogenous interaction of relative prices.

The model distinguishes between 30 representative households that are disaggregated across the two sub-national regions (i.e., Mekong Delta and RoV), by farm/nonfarm, fish/crop-only farms, and by per capita expenditure quintiles. Households receive income in payment for producers' use of their factors of production, and then pay direct taxes, save (i.e., invest) and make foreign transfers (all at fixed rates). Households then use their remaining income to consume commodities under a linear expenditure system (LES) of demand. The government receives revenues from imposing direct and indirect taxes, and then makes transfers to households and the rest of the world. The government also purchases commodities in the form of recurrent consumption expenditures, and the remaining income of the government is saved (with budgets deficits representing negative savings). All savings from households, government and the rest of the world (foreign savings) are collected in a savings pool from which investment is financed.

The model includes three broad macroeconomic accounts: the government balance, the current account, and the savings-investment account. In order to bring about balance among the various macro accounts, it is necessary to specify a set of 'macro-closure' rules, which provide a mechanism through which macroeconomic balance can be achieved. A savings-driven closure is assumed in order to balance the savings-investment account. Under this closure, the marginal propensities of households to save are fixed, while investment adjusts to income changes to ensure that the level of investment and savings are equal. For the current account it is assumed that a flexible exchange rate adjusts in order to maintain a fixed level of foreign savings. In other words, the external balance is held fixed in foreign currency terms. Finally, in the government account, direct tax rate rates are fixed and the fiscal deficit adjusts to equate total revenues and expenditures.

The model is calibrated to the 2011 social accounting matrix (SAM). This SAM is updated from 2007 SAM by CIEM in which we assume that the structure of the economy is unchanged and updates 2011 data. In addition, the information used to disaggregate households in the SAM was drawn from 2010 VHLSS that is the most updated household survey in Vietnam.

The model distinguishes between 30 representative households that are disaggregated across the two sub-national regions (i.e., Mekong Delta and RoV), by farm/nonfarm, fish/crop-only farms, and by per capita expenditure quintiles. The model is calibrated to the 2007 social accounting matrix (SAM) of Vietnam as introduced in Chapter 2 of this report. For this chapter, the national SAM is regionalized to separate out the Mekong Delta, for whom the fisheries sectors play an especially important and unique role. Moreover, a more detailed structure of the fisheries sector is included to isolate the indirect economic linkage that fish feed plays between ocean fisheries and aquaculture. The information used to disaggregate households in the SAM was drawn from 2006 VHLSS.

Impact of excise tax imposition

Empirical results: impact on the industry

In this empirical analysis, for the own price elasticity of the non-alcoholic sparkling soft drink and cross-price elasticity of other soft drinks, we conduct a regression for the following functional form:

$$\ln Y = \beta_1 + \beta_2 \ln P + \beta_3 \ln X_1 + \dots + \beta_n \ln X_n + \alpha_m \ln(X_p X_q) + e$$

where Y is the quantity demanded, P is price, X1 to X2 is control variables (in this case we analyse the relationship of quantity demanded and prices of other drinks, e.g. fruit juice, energy drink, packed water and soya milk), interaction between control variables, and e is residual. Particularly, in the empirical regression we consider the relationship between sparkling (carbonated) soft drink (SSD) and its price. Also, in the following regressions, we analyse the relationship between quantity demanded of other soft drinks and price of carbonated soft drink.

In the regression for the relation between carbonated soft drink (SSD) and its price, control variables included are the increase in income of the consumers, proxied by growth in GDP, price of energy drink, price of fruit juice, price of packaged water, price of soya milk and the interaction between its own price and price of energy drink. The regression results based on database collected from 6 largest cities/provinces in Vietnam are presented as follows:¹⁴

¹⁴See Annex I for the full results of the regression as reported by Statistical Software STATA 12.

$$Y_{SSD} = -2.81 * P_{SSD} + 0.0009 * dGDP + 3.98 * P_{ED} - 0.96 * P_{FJ} - 1.98 * P_{PW} - 0.55 * P_{SM} + 1.81 * PP_{SSDED} \quad (\text{Eq 1})$$

The results show that, carbonated soft drinks are very sensitive with the change in price. Particularly, the quantity of carbonated soft drinks demanded will reduce by 2.8% if their price is up by (+1%). With this high price elasticity of demand, the total revenue of the sector will reduce with any increase price of the items. From the results of the regression we can project the impact of an increase of carbonated soft drinks price on its volume demand as well as the impact government revenue from the industry. The results show that a 10% increase of price due to the imposition of excise tax as proposed in the draft of revised law on excise tax therefore will result in 28% reduction of demand for carbonated soft drinks.¹⁵

The projection shows that, the impact of an imposition of excise tax of 10% on the sale of carbonated soft drinks in 6 largest cities/provinces in Vietnam is significant. The application of proposed excise tax will result in a reduction of -825,100 units in quantity demanded. As a result, a loss of **VND 851 billion (equivalent to about USD 40.5 million)** to the carbonated soft drink industry.¹⁶ Table 10 represents the detailed estimation.

Table 11. Effects of Excise Tax of 10% on Carbonated Soft Drinks in 6 largest cities/provinces

No	Items	Carbonated Drinks Industry
1	Price elasticity of carbonated soft drinks	-2.8
2	The quantity average demand in 2013 ('000 units ¹⁷)	3,927
3	Average sale value in 2013 (million vnd)	470,822
4	Total sale value in 2013 (million vnd)	5,649,864
5	Average price of carbonated soft drinks ('000 vnd)	120

¹⁵See Annex I for the full results of the regression as reported by Statistical Software STATA 12.

¹⁶Please keep in mind that this is a partial impact of excise imposition on carbonated soft drink industry given the available data is of 6 cities/provinces among 63 provinces of the country and it is estimated with the use of own price elasticity of carbonated soft drink, while excise imposition on carbonated soft drink can affects other types of soft drinks as well.

¹⁷The unit is unit case used in the soft drink industry, which is equivalent to 5.678 litre

No	Items	Carbonated Drinks Industry
6	Proposed excise tax rate on carbonated soft drinks (%)	10
7	Price after excise tax	129
8	Quantity of carbonated drinks after excise imposition ('000 units)	3,102
9	Loss/gain of quantity demanded of carbonated drinks ('000 units)	-825
10	Average sale value after excise imposition (million vnd)	399,846
11	Loss/profit in a month(million vnd)	-70,976
12	Loss/profit in a year(million vnd)	-851,717

As these impacts taking place, the substitution effect of the excise tax imposition on carbonated soft drinks will happen and benefit other beverage categories. Hence the proposed excise tax on carbonated soft drinks could be deemed discriminatory in nature which may raise question among foreign non-alcoholic beverage players.

Empirical results: impact on the economy

In previous section, we project the partial impact on the carbonated soft drink industry alone by the using the own price elasticity of demand of carbonated drinks. Another question can be raised about the impact of such imposition of excise tax on an industry, carbonated soft drinks in this case, to the whole economy. To answer this question, a CGE is built and used as described in previous section. Before estimating the impact of the excise imposition on carbonated soft drink industry on the whole economy, it is necessary to first specify a baseline scenario that reflects development status of Vietnam in 2011¹⁸. The baseline provides foundations for growth and structural change of the economy in 2011 that can be used as a basis for comparison.

Economic growth in the CGE model is determined by rates of factor accumulation and technical change. The assumed values for the baseline are shown in Table 9 below.

¹⁸The CGE model is built by CIEM using IO table for 2007 and updated with 2011 data of SUT (supply and use table). This is the most current available data for CGE analysis in Vietnam.

Table 12. Vietnam in 2011

Items	Value
GDP by current price (billion VND)	2,535,008
Agriculture, forestry and fishing	558,284
Industry and construction	1,034,057
Service	942,667
Structure of GDP (%)	100.00
Agriculture, forestry and fishing	22.02
Industry and construction	40.79
Service	37.19
GDP by expenditure category at current prices(billion VND)	2,535,008
Gross capital formation	827,032
Gross fixed capital formation	745,494
Changes in stocks	81,538
Final consumption	1,794,465
State	164,323
Private	1,630,143
Trade balance (goods & services)	(106,852)
Statistical discrepancy	20,363
GDP by expenditure category at current prices (%)	100.00
Gross capital formation	32.63
Gross fixed capital formation	29.41
Changes in stocks	3.22
Final consumption	70.79
State	6.48
Private	64.31
Trade balance (goods & services)	-4.22
Statistical discrepancy	0.8

Source: GSO (2012)

In the scenario where the government applies the proposed excise tax of 10% on carbonated soft drinks, the reduced demand finally causes reduction in output and production of the industry. As a result, carbonated soft drink industry's customers and suppliers also suffer from the reduction in carbonated soft drink industry. The input price increases for the customers while the output reduces

for the suppliers of the carbonated soft drink industry. Moreover, income of household is also affected since reduction in output of the industry means a reduction of jobs created.

A 10% excise tax applied on carbonated soft drink will not transfer totally as 10% tax on the carbonated soft drink industry since the share of carbonated soft drink is about 50% of the total industry production. The simulation of 10% excise tax imposition on carbonated soft drink that takes into account the share the carbonated soft drink in the industry shows that quantity of domestic productions of beverage products decreases by 0.58 percent. The imposition leads to the decline of total aggregate demands or GDP by 0.01 percent. This equivalent to a decrease of VND 253.5 billion, or **USD 12.1 million**.

Empirical results: impact on the Government budget

By applying two approaches analyzing the partial impact of excise tax on the carbonated soft drink industry and the economy, partial impact on government revenue can also be revealed. The projection from elasticity analysis shows that, increase in government revenue from excise tax on carbonated soft drinks is anticipated to reach VND 396.5 billion, equivalent to USD 18.9 million. However, based on price elasticity, as excise tax pushes up prices, consumption and sales volume are likely to reduce. As such government excise tax revenue would also be reduced. Furthermore, as consumption and sales volume reduce, it is likely that government revenue from value added tax would further reduced by VND 85.2 billion (USD 4.1 million).¹⁹ Government revenue from enterprise income tax would also be reduced due to the reduction of total sale of carbonated soft drink. The loss of enterprise income tax is projected to be about VND 77.1 billion (USD 3.7 million) (see table 12 for more detail).²⁰ Therefore it is projected that total government revenue increase from imposition of excise tax on carbonated soft drink will only reach **VND 234.3 billion (USD 11.16 million)**

Table 13. Impact on government revenue from elasticity approach

¹⁹A rate of 10% of value added tax is applied in Vietnam for carbonated soft drink industry. We assume that total reduction in revenue due to application of excise tax is from value added.

²⁰This is estimated based on the coefficient between enterprise income tax and value added tax paid by enterprises. In Vietnam, value added tax is usually higher than enterprise income tax. This coefficient is estimated and equals 0.905

No	Government budget components (million VND)	Carbonated Drinks Industry
1	Increase in government revenue due to excise tax imposition	396,541
2	The loss of value added revenue	-85,172
3	The loss of enterprise income tax	-77,105
4	Government revenue (revenue subtracted by losses)	234,264

Considering impact on GDP using CGE approach, imposition of excise tax on carbonated soft drinks will reduce GDP by **USD 12.1 million** which in turn will reduce government revenue further by VND 56.5 billion or **USD 2.7 million**.²¹

Therefore, it can be estimated based on available data and regression analysis along with the CGE simulation, the imposition of excise tax on carbonated soft drinks will only generate merely **USD 8.46 million** less than half of the amount anticipated originally... This revenue again came at the cost of a total loss of USD 52.6 million (VND 1,105 billion) to the economy. (Soft drink industry revenue loss of **USD 40.5 million** or VND 851 billion and **USD 12.1 million** or VND 253.5 billion loss to other sectors)

It is worth to emphasize that the above projected revenue from imposition of excise tax on carbonated soft drinks could be reduced even further as the impacts of carbonated soft drink excise tax on other soft drinks and related items are not included. The costs of collecting excise tax is not covered neither. Furthermore, this impact analysis covers only 6 cities/provinces whose data on carbonated soft drinks are available for meaningful regression analysis. Therefore we can anticipate that the if taken into consideration all the parameters adversely affected by carbonated soft drinks excise tax, the government revenue gain will be much smaller than what is originally anticipated.

²¹ This is estimated as government tax revenue in GDP. The coefficient is estimated for 2011 data and equal to 0.223.

Conclusion

Imposition of excise tax on carbonated soft drinks is being proposed by the Ministry of Finance. This study is an effort to estimate economic impacts of this imposition on the carbonated soft drink industry, government budget and the economy. Using price elasticity of demand analysis with data for largest 6 cities/provinces in term of soft drinks consumption and CGE approach with economy-wide data, our study is able to estimate partial impacts of the proposed excise tax.

Our partial impact analysis shows that, if the proposed excise tax will be imposed on the carbonated soft drink industry, beside the marginal increase in government revenue the excise tax imposition results in the negative impact on the industry and other industries of the economy. Particularly, if the proposed excise tax on carbonated soft drink is applied, it will merely generate **USD 8.46 million** or less of revenue to the government. This marginal revenue will come at the cost of carbonated soft drink industry revenue loss of **USD 40.5 million** (VND 851 billion) and **USD 12.1 million** (VND 253.5 billion) loss to other sectors, of a total loss of USD 52.6 million (VND 1,105 billion) to the economy.

Therefore, from the study, the imposition of excise tax on carbonated soft drink is questionable economically.

References

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4. The National Assembly, 2008, Law No. 27/2008/QH12 on Excise Tax
5. University of Indonesia, 2013, The profile of soft drink industry and the economic impact of excise tax imposition on carbonated drink
6. Vinamilk, 2012, The annual report 2012

ANNEX I. The empirical elasticity model

Source	SS	df	MS
Model	8.6674	7	1.2382
Residual	0.3709	74	0.0050
Total	9.0383	81	0.1116

Number of obs	82
F(7,74)	247.05
Prob> F	0.000
R-squared	0.959
Adj R-squared	0.955
Root MSE	0.071

Inssd	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
lnprice	-2.8102	1.6784	-1.67	0.098	-6.154	0.534
DGDP	0.0009	0.0108	0.09	0.931	-0.021	0.022
lnpried	3.9808	0.4121	9.66	0.000	3.160	4.802
lnprifj	-0.9574	0.6005	-1.59	0.115	-2.154	0.239
lnpricepw	-1.9759	0.2883	-6.85	0.000	-2.550	-1.401
lnprism	-0.5510	0.1578	-3.49	0.001	-0.865	-0.237
ipriceed	1.8143	0.7693	2.36	0.021	0.281	3.347
cons	-0.9174	0.8067	-1.14	0.259	-2.525	0.690

ANNEX II. Extract of the Law on Excise Tax

(Law No. 27/2008/QH12)

Article 2. Taxable objects

1. Goods:

a/ Cigarettes, cigars and other tobacco preparations used for smoking, inhaling, chewing, sniffing or keeping in mouth;

b/ Liquor;

c/ Beer;

d/ Under-24 seat cars, including cars for both passenger and cargo transportation with two or more rows of seats and fixed partitions between passenger holds and cargo holds;

e/ Two- and three-wheeled motorcycles of a cylinder capacity of over 125 cm³;

f/ Aircraft and yachts;

g/ Gasoline of all kinds, naphtha, reformed components and other components for mixing gasoline;

h/ Air-conditioners of 90,000 BTU or less;

i/ Playing cards;

j/ Votive gilt papers and votive objects.

2. Services:

a/ Dance halls;

b/ Massage parlors and karaoke bars;

c/ Casinos; prize-winning video games, including jackpot and slot games and games on similar machines;

d/ Betting;

e/ Golf business, including the sale of membership cards and golf playing tickets;

f/ Lottery business.

Article 7. Tax rates

Excise tax rates for goods and services are specified in the Excise Tariff below:

EXCISE TARIFF

No.	Goods or services	Tax rate (%)
I	Goods	
1	Cigarettes, cigars and other tobacco preparations	65
2	Liquor	
	a/ Of 20° proof or higher	
	From January 1, 2010, through December 31, 2012	45
	From January 1, 2013	50
	b/ Of under 20° proof	25
3	Beer	
	From January 1, 2010, through December 31, 2012	45
	From January 1, 2013	50
4	Under-24 seat cars	
	a/ Passenger cars of 9 seats or fewer, except those specified at Points 4e, 4f and 4g of this Article	
	Of a cylinder capacity of 2,000 cm ³ or less	45
	Of a cylinder capacity of between over 2,000 cm ³ and 3,000 cm ³	50
	Of a cylinder capacity of over 3,000 cm ³	60
	b/ Passenger cars of between 10 seats and under 16 seats, except	30

	those specified at Points 4e, 4f and 4g of this Article	
	c/ Passenger cars of between 16 seats and under 24 seats, except those specified at Points 4e, 4f and 4g of this Article	15
	d/ Cars for both passenger and cargo transportation, except those specified at Points 4e, 4f and 4g of this Article	15
	e/ Cars running on gasoline in combination with electricity or bio-fuel, with gasoline accounting for not more than 70% of the used fuel	70% of the tax rate for cars of the same kind as specified at Points 4a, 4b, 4c and 4d of this Article
	f/ Cars running on bio-fuel	50% of the tax rate for cars of the same type as specified at Points 4a, 4b, 4c and 4d of this Article
	g/ Electrically-operated cars	
	Passenger cars of 9 seats or fewer	25
	Passenger cars of between 10 seats and under 16 seats	15
	Passenger cars of between 16 seats and under 24 seats	10
	Cars for both passenger and cargo transportation	10
5	Two- and three-wheeled motorcycles of a cylinder capacity of over 125 cm ³	20
6	Aircraft	30
7	Yachts	30
8	Gasoline of all kinds, naphtha, reformade components and other components for mixing gasoline	10
9	Air conditioners of 90,000 BTU or less	10
10	Playing cards	40
11	Votive gilt papers and votive objects	70
II	Services	
1	Dance halls	40
2	Massage parlors and karaoke bars	30
3	Casinos and prize-winning video games	30
4	Betting	30
5	Golf business	20
6	Lottery business	15

ANNEX III.Key Equations of Standard CGE model applied

EQUATIONS

Price Block

Import price	$PM_c = pwm_c * (1 + tm_c) * EXR + \sum_{c' \in CT} PQ_{c'} * icm_{c'c}$	$c \in CM$ (1)
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Export price	$PE_c = pwe_c * (1 - te_c) * EXR - \sum_{c' \in CT} PQ_{c'} * ice_{c'c}$	$c \in CE$ (2)
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Demand price of domestic nontraded goods	$PDD_c = PDS_c + \sum_{c' \in CT} PQ_{c'} * icd_{c'c}$	$c \in CD$ (3)
--	--	----------------

Absorption	$PQ_c * (1 - tq_c) * QQ_c = PDD_c * QD_c + PM_c * QM_c$	c $\in (CD$ $\cup CM)$ (4)
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Marketed output value	$PX_c * QX_c = PDS_c * QD_c + PE_c * QE_c$	$c \in CX$ (5)
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Activity price	$PA_a = \sum_{c \in C} PXAC_{ac} * \theta_{ac}$	$a \in A$ (6)
----------------	---	---------------

Aggregate intermediate input price	$[PINTA_a] = \sum_{c \in C} PQ_c * ica_{ca}$	$a \in A$ (7)
------------------------------------	--	---------------

Activity revenue and costs	$PA_a * (1 - ta_a) * QA_a = PVA_a * QVA_a + PINTA_a * QINTA_a$	$a \in A$ (8)
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Consumer price index	$\overline{CPI} = \sum_{c \in C} PQ_c * cwts_c$	(9)
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Producer price index for nontraded market output	$DPI = \sum_{c \in C} PDS_c * dwts_c$	(10)
--	---------------------------------------	------

Production and Trade Block

CES technology: Activity production function	$QA_\alpha = \alpha_\alpha^\alpha * \left(\delta_a^a * QVA_a^{-\rho_a} + (1 - \delta_a^a) * QINTA_a^{-\rho_a} \right)^{\frac{1}{\rho_a}}$	$a \in ACES$ (11)
--	--	-------------------

CES technology: Value-added intermediate-input	$\frac{QVA_a}{QINTA_a} = \left(\frac{PINTA_a}{PVA_a} * \frac{\delta_a^a}{1 - \delta_a^a} \right)^{\frac{1}{1 + \rho_a}}$	$a \in ACES$ (12)
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quantity ratio

Leontief technology: $QVA_a = iva_a * QA_a$ $a \in ALEO$ (13)

Demand for aggregate

value added

Leontief technology: $QINTA_a = inta_a * QA_a$ $a \in ALEO$ (14)

demand for Aggregate

intermediate input

Value-added and factor demands $QVA_a = \alpha_a^{va} * \left(\sum_{f \in F} \delta_{fa}^{va} * QF_{fa}^{-\rho_a^{va}} \right)^{\frac{1}{\rho_a^{va}}}$ $a \in A$ (15)

Factor demand

$$WF_f * \overline{WFDIST}_{fa} = PVA_a * (1 - tva_a) * QVA_a$$

$$* \left(\sum_{f \in F'} \delta_{fa}^{va} * QF_{fa}^{-\rho_a^{va}} \right)^{-1} * \delta_{fa}^{va} * QF_{fa}^{-\rho_a^{va-1}}$$

$a \in A$ (16)
 $f \in F$

Disaggregate intermediate input demand

$$QINT_{ca} = ica_{ca} * QINTA_a$$

$a \in A$ (17)
 $c \in C$

Commodity production and allocation

$$QXAC_{ac} + \sum_{h \in H} QHA_{ach} = \theta_{ac} * QA_a$$

$a \in A$ (18)
 $a \in CX$

Output aggregation function

$$QX_c = \alpha_c^{ac} * \left(\sum_{a \in A} \delta_{ac}^{ac} * QXAC_{ac}^{-\rho_c^{ac}} \right)^{\frac{1}{\rho_c^{ac}-1}}$$

$c \in CX$ (19)

First-order condition for output aggregation function

$$PXAC_{ac} = PX_c * QX_c \left(\sum_{a \in A'} \delta_{ac}^{ac} * QXAC_{ac}^{-\rho_c^{ac}} \right)^{-1} * \delta_{ac}^{ac} * QXAC_{ac}^{-\rho_c^{ac}-1}$$

$a \in A$ (20)
 $c \in CX$

Output Transformation (CET) function

$$QX_c = \alpha_c^t * \left(\delta_c^t * QE_c^{\rho_c^t} + (1 - \delta_c^t) * QD_c^{\rho_c^t} \right)^{\frac{1}{\rho_c^t}}$$

c (21)
 $\in (CE$
 $\cap CD)$

Export-domestic supply ratio

$$\frac{QE_c}{QD_c} = \left(\frac{PE_c}{PDS_c} * \frac{1 - \delta_c^t}{\delta_c^t} \right)^{\frac{1}{\rho_c^t-1}}$$

c (22)
 $\in (CE$
 $\cap CD)$

Output transformation for non-exported commodities

$$QX_c = QD_c + QE_c \quad c \in (CD \cap CEN) \cup (CE \cup CDN) \quad (23)$$

Composite supply (Armington) function

$$QQ_c = \alpha_c^q * (\delta_c^q * QM_c^{-\rho_c^q} + (1 - \delta_c^q) * QD_c^{-\rho_c^q})^{-\frac{1}{\rho_c^q}} \quad c \in (CM \cap CD) \quad (24)$$

Import-domestic demand ratio

$$\frac{QM_c}{QD_c} = \left(\frac{PDD_c}{PM_c} * \frac{\delta_c^q}{1 - \delta_c^q} \right)^{\frac{1}{1 + \rho_c^q}} \quad c \in (CM \cap CD) \quad (25)$$

Composite supply for non-imported outputs and nonproduced imports

$$QQ_c = QD_c + QM_c \quad c \in (CD \cap CMN) \cup (CM \cup CDN) \quad (26)$$

Demand for transactions services

$$QT_c = \sum_{c' \in C'} (icm_{cc'} * QM_{c'} + ice_{cc'} * QE_{c'} + icd_{cc'} * QD_{c'}) \quad c \in CT \quad (27)$$

Institution Block

Factor income

$$YF_f = \sum_{a \in A} WF_f * \overline{WFDIST}_{fa} * QF_{fa} \quad f \in F \quad (28)$$

Institutional factor incomes

$$YIF_{if} = shif_{if} * [(1 - tf_f) * YF_f - trnsfr_{row f} * EXR] \quad i \in INSD \quad f \in F \quad (29)$$

Income of domestic, nongovernment institutions

$$YI_i = \sum_{f \in F} YIF_{if} + \sum_{i' \in INSDNG'} TRII_{i'i'} + trnsfr_{i gov} * \overline{CPI} + trnsfr_{i row} * EXR \quad i \in INSDNG \quad (30)$$

Intra-institutional transfers

$$TRII_{i'i'} = shii_{i'i'} * (1 - MPS_{i'}) * (1 - TINS_{i'}) * YI_{i'} \quad i \in INSDNG \quad i' \in INSDNG' \quad (31)$$

Household consumption expenditure

$$EH_h = \left(1 - \sum_{i \in INSDNG} shii_{ih} \right) * (1 - MPS_h) * (1 - TINS_h) * YI_h \quad h \in H \quad (32)$$

Household consumption demand for marketed commodities

$$PQ_c * QH_{c h} = PQ_c * \gamma_{c h}^m + \beta_{c h}^m \quad c \in C \quad (33)$$

$$* \left(EH_h - \sum_{c' \in C} PQ_{c'} * \gamma_{c' h}^m - \sum_{a \in A} \sum_{c' \in C} PXAC_{a c'} * \gamma_{a c' h}^h \right) \quad h \in H$$

Household consumption demand for home commodities

$$PXAC_{a c} * QHA_{a c h} = PXAC_{a c} * \gamma_{a c h}^h + \beta_{a c h}^h \quad a \in A \quad (34)$$

$$* \left(EH_h - \sum_{c' \in C} PQ_{c'} * \gamma_{c' h}^m - \sum_{a \in A} \sum_{c' \in C} PXAC_{a c'} * \gamma_{a c' h}^h \right) \quad c \in C \quad h \in H$$

Investment demand

$$QINV_c = \overline{IADJ} * \overline{qinv}_c \quad c \in CINV \quad (35)$$

Government consumption demand

$$QG_c = \overline{GADJ} * \overline{qg}_c \quad c \in C \quad (36)$$

Government revenue

$$YG = \sum_{i \in INSDNG} TINS_i * YI_i + \sum_{f \in F} tf_f * YF_f + \sum_{a \in A} tva_a * PVA_a * QVA_a \quad (37)$$

$$+ \sum_{a \in A} ta_a * PA_a * QA_a + \sum_{c \in CM} tm_c * pwm_c * QM_c$$

$$* EXR + \sum_{c \in CE} te_c * pwe_c * QE_c * EXR + \sum_{c \in C} tq_c$$

$$* PQ_c * QQ_c + \sum_{f \in F} YIF_{gov f} + trnsfr_{gov row} * EXR$$

Government expenditure

$$EG = \sum_{c \in C} PQ_c * QG_c + \sum_{i \in INSDNG} trnsfr_{i gov} * \overline{CPI} \quad (38)$$

System

Constraint Block

Factor market

$$\sum_{a \in A} QF_{f a} = \overline{QFS}_f \quad f \in F \quad (39)$$

Composite commodity markets

$$QQ_c = \sum_{a \in A} QINT_{c a} + \sum_{h \in H} QH_{c h} + QG_c + QINV_c + qdst_c + QT_c \quad c \in C \quad (40)$$

Current account balance for rest of the world (in foreign currency)

$$\sum_{c \in CM} pwm_c * QM_c + \sum_{f \in F} trnsfr_{row f} \quad (41)$$

$$= \sum_{c \in CE} pwe_c * QE_c + \sum_{i \in INSD} trnsfr_{i row} + \overline{FSAV}$$

Government balance

$$YG = EG + GSAV \quad (42)$$

Direct institutional tax rates $TINS_i = \overline{tins}_i * (1 + \overline{TINSADJ} * tins01_i) + \overline{DTINS} * tins01_i$ $i \in INSDNG$ (43)

Institutional savings rates $MPS_i = \overline{mps}_i * (1 + \overline{MPSADJ} * mps01_i) + \overline{DMPS} * mps01_i$ $i \in INSDNG$ (44)

Saving-Investment Balance
$$\sum_{i \in INSDNG} MPS_i * (1 - TINS_i) * YI_i + GSAV + EXR * \overline{FSAV} = \sum_{c \in C} PQ_c * QINV_c + \sum_{c \in C} PQ_c * qdst_c$$
 (45)

Total absorption
$$TABS = \sum_{h \in H} \sum_{c \in C} PQ_c * QH_{ch} + \sum_{a \in A} \sum_{c \in C} \sum_{h \in H} PXAC_{ac} * QHA_{ach} + \sum_{c \in C} PQ_c * QG_c + \sum_{c \in C} PQ_c * QINV_c + \sum_{c \in C} PQ_c * qdst_c$$
 (46)

Ratio of investment to absorption $INVSHR * TABS = \sum_{c \in C} PQ_c * QINV_c + \sum_{c \in C} PQ_c * qdst_c$ (47)

Ration of government consumption to absorption $GOVSHR * TABS = \sum_{c \in C} PQ_c * QG_c$ (48)

ANNEX IV.CGE Model Data for Vietnam

National accounts (GSO)

	2011
Gross capital formation	866,744
Gross fixed capital formation	785,206
Changes in stocks	81,538
Final consumption	1,957,848
State	164,323
Private	1,793,525
Trade balance (goods & services)	-44,712
Exports	2,206,971
Imports	2,251,683
Statistical discrepancy	0

State expenditures

	2011
A Total expenditures	739,926
<u>I Current expenditure</u>	<u>546,081</u>
1 Administration expenditure	68,202
2 Economic expenditure	55,212
3 Social expenditure	264,331
4 Defence	0
5 Security	0
6 Interest payment	36,560
7 Expenditure on reform of salary policy	14,265
8 Others	107,511
<u>II Expenditure on investment development</u>	<u>193,845</u>
1 Capital construction expenditure	185,000
2 Others	8,845
<u>III Contingency</u>	<u>0</u>
Brought forward expenditure	22,400

State revenues

	2011
A Total revenues and grants (I+IV+V)	704,267
<u>I Current revenues (II+III)</u>	<u>644,003</u>
<u>II Taxes</u>	<u>600,500</u>
1 Corporate income tax	184,481
2 Individual income tax	38,463
3 Land and housing tax	1,604
4 Licence tax	1,476
5 Tax on the transfer of properties	15,701
6 Tax on land use right transfer	0
7 Value added tax	195,451
8 Special cons. tax for domestic	42,525
9 Natural resources tax	39,287

10	Agricultural tax	72
11	Imp - Exp. tax, special cons. tax on imports	81,440
12	Other taxes	0
III	<u>Fees, charges and non-tax</u>	<u>43,503</u>
13	From discrepancy of import prices	0
14	Fees and charges (include gasoline fee)	19,465
15	Rental of land	5,570
16	Others	18,468
	<u>Capital revenues (revenues from sale of State -</u>	
IV	<u>owned houses, land use right assignment)</u>	<u>53,058</u>
V	<u>Grants</u>	<u>7,206</u>
B	<u>Brought forward revenue</u>	<u>10,000</u>

Balance of payments data (IMF)

Millions of USD

	2011
<u>Current Account, n.i.e 78ald</u>	233
Goods: Exports f.o.b 78aad	96,906
Goods: Imports f.o.b 78abd	-97,356
<u>Trade Balance 78acd</u>	-450
Services: Credit 78add	8,692
Services: Debit. 78aed	-11,860
<u>Balance on Goods & Services. 78afd</u>	-3,618
Income: Credit. 78agd	395
Income: Debit 78ahd	-5,229
<u>Balance on Gds, Serv. & Inc. 78aid</u>	-8,452
Current Transfers, n.i.e.: Credit 78ajd	8,685
Current Transfers: Debit. 78akd	0
Aid inflows - OECD DAC	3,285
Private (FDI, Loans, Port) - GSO	8,029
Exchange rate	20,506

ANNEX V. Macroeconomic SAM for the Model

	Activities	Comodities	Land	Labour	Capital	Ent.	HouseH.	Gov.	Act. tax	Factor tax	Sale tax	Import tax	Ent. tax	Income tax	Stocks	Saving- inv	RoW	Total
Activities		2,710,166																2,710,166
Comodities	1,742,054	205,527					759,386	139,746							12,886	466,851	766,862	4,093,311
Land	62,867																	62,867
Labour	499,343																0	499,343
Capital	390,008																0	390,008
Enterprises					332,142			31,182									17,488	380,812
Households			60,423	499,343		155,830		36,597									58,624	810,817
Governments						45,796	0		15,894	8,134	120,731	32,006	0	111,153			4,256	337,969
Activity tax	15,894																	15,894
Factor tax			2,444		5,690													8,134
Sale tax		120,731																120,731
Import tax		32,006																32,006
Enterprise tax																		0
Income tax						103,024	8,129											111,153
Change in stocks																12,886		12,886
Saving-investment						76,162	43,302	130,444										479,737
Rest of the world		1,024,882		0	52,176	0	0	0										1,077,058
Total	2,710,166	4,093,311	62,867	499,343	390,008	380,812	810,817	337,969	15,894	8,134	120,731	32,006	0	111,153	12,886	479,737	1,077,058	

ANNEX VI. Impacts of excise tax on GDP

(Results produced by GAMS)

		ABSORP	PRVCON	FIXINV	DSTOCK	GOVCON	EXPORTS	IMPORTS	GDPMP	GDPMP2	NETITAX	GDPFC2
NOMINAL	BASE	3.0152	1.8135	0.7852	0.2521	0.1643	2.0164	-2.2517	2.7799	2.7799	0.4059	2.3740
NOMINAL	TARCUT2	-0.01038	-0.0060	-0.0184	-0.0110	-0.0192	-0.0160	-0.0161	-0.0098	-0.0098	0.0555	-0.0210
REAL	BASE	3.0152	1.8135	0.7852	0.2521	0.1643	2.0164	-2.2517	2.7799		0.4059	2.3740
REAL	TARCUT2	-0.0014	-0.0023				0.0007	0.0007	-0.0015		-0.0103	0.0000
NOMSHARE	BASE	108.4649	65.2375	28.2460	9.0702	5.9112	72.5344	-80.9993	100.0000	100.0000	14.6016	85.3984
NOMSHARE	TARCUT2	-0.0005	0.0038	-0.0086	-0.0012	-0.0094	-0.0062	-0.0063	0.0000	0.0000	0.0653	-0.0112
REALSHARE	BASE	108.4649	65.2375	28.2460	9.0702	5.9112	72.5344	-80.9993	100.0000		14.6016	85.3984
REALSHARE	TARCUT2	0.0001	-0.0008	0.0015	0.0015	0.0015	0.0022	0.0022	0.0000		-0.0088	0.0015
DEFLATOR	BASE	100	100	100	100	100	100	100	100		100	100
DEFLATOR	TARCUT2	-0.0090	-0.0037	-0.0184	-0.0110	-0.0192	-0.0168	-0.0168	-0.0083		0.0657	-0.0210

ANNEX VII. Impacts of excise tax on industries

(Results produced by GAMS)

No	Industry	BASE LINE	EXCISE TAX IMPOSITION
1	apadd	0.311162691	0.005199295
2	asugr	0.017418107	0.006538302
3	aacrp	0.08162257	0.000766059
4	arubb	0.015513009	0.00040955
5	acoff	0.037969392	-0.020913731
6	altea	0.006341878	-0.000181997
7	apcrp	0.099828921	-0.03291866
8	abovp	0.11829032	0.012950113
9	apoul	0.045533969	0.003882107
10	aoliv	0.042464545	0.008973534
11	afore	0.020735493	0.019037157
12	afish	0.077487079	0.037990322
13	aaqua	0.128479907	0.040567029
14	acoal	0.072191791	0.00075195
15	acoil	0.171803192	0.000280395
16	angas	0.040453121	0.000214265
17	aomin	0.033824548	0.001016106
18	ameat	0.049031555	0.01465618
19	apfsh	0.184951276	0.062601677
20	apveg	0.034875612	0.007199529
21	apoil	0.027842594	0.010320689
22	adair	0.044058606	0.00660759
23	arice	0.101749477	0.032320435
24	aflou	0.022645835	-0.000480728
25	afood	0.251547613	0.008213568
26	abevn	0.060906926	-0.587402961
27	abeva	0.017743638	-0.050489618
28	atoba	0.05015579	0.015141942
29	afibr	0.084124868	0.010619178
30	atext	0.071898824	0.010913222
31	aclth	0.153063097	0.009420197
32	aleat	0.059297891	0.017764667
33	afoot	0.091659552	0.021998895

No	Industry	BASE LINE	EXCISE TAX IMPOSITION
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34	awood	0.052114925	0.048777518
35	apapr	0.066088551	0.001409013
36	aprnt	0.027452772	0.004155161
37	afuel	0.109180048	0.00378498
38	achem	0.362966448	0.003816183
39	anmet	0.059808327	-0.008625703
40	aceme	0.115490956	0.000546276
41	ametl	0.150584185	-0.001207381
42	ametp	0.211731654	0.000192809
43	amach	0.354077418	0.005114195
44	aemch	0.032840228	0.004215742
45	avehe	0.301682712	0.006798895
46	afurn	0.126231277	0.017311203
47	aoman	0.056614516	-0.049627209
48	aelec	0.140595625	0.001801059
49	awatr	0.015171936	-0.001655134
50	acons	0.622189339	0.000100181
51	atrad	0.437988369	0.001660363
52	ahotl	0.041344798	0.004866821
53	atrnr	0.141765219	-0.004796367
54	atrna	0.01874452	0.006378126
55	atrno	0.098764317	0.006393415
56	acommm	0.197358996	-0.018923658
57	abusi	0.073316641	-0.018162495
58	afsrv	0.168431713	0.006787928
59	areal	0.118777976	0.00854345
60	aadmnn	0.141438236	0.002746955
61	aeduc	0.105085044	0.010045129
62	aheal	0.053206239	0.010473473
63	aosrv	0.060578175	0.008017495