

**ESCUELA DE GRADUADOS EN ADMINISTRACIÓN PÚBLICA Y
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COST - EFFECTIVENESS ANALYSIS

HEALTH (2ND DRAFT)

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ABSTRACT. *This report estimates the cost-benefit ratio of tobacco excise tax in Mexico, considering its costs produced to the economy –less production and its inherited deadweight loss– and its benefits generated to public health –less health expenditure and more economical productivity. Estimations account that public expenditure destined to treat tobacco-attributable diseases is between \$9.8 billion and \$43.0 billion MXN per year. The Mexican economic census for year 2009 revealed that the tobacco industry produced around \$33.4 billion MXN. This represent that, by itself, this market has externalities that could get larger than its gross production. Currently, IEPS (tobacco excise tax) promotes a reduction in tobacco consumption by increasing its price. Its overall economic impact has larger benefits –correcting externalities– than costs –distorting the market. Although, it is worth to mention that private benefits –private health disbursements– were not considered due to lack of information available. However, should this tax be still increased to reach the breakpoint where IEPS's collection equals public health expenditure? If these expenditures are greater than tobacco industry's gross production, what should the government do with it?*

I. Introduction

On one hand, Mexico has an average annual consumption¹ of 2.4 billion packs of cigarettes (Waters *et al.* 2010), that represented, in year 2009, a gross product of \$33.4 billion MXN² (INEGI 2009) and an employment of over 10,000 people nationwide (Waters *et al.* 2010). On the other, tobacco-attributable diseases have, every year, more than 48,000 new cases and cause the death of around 25,000 and 65,000 people in the country³ (Waters *et al.* 2010); since 1938, different health institutes and studies have revealed that tobacco consumption is closely related to cancer, cardiovascular problems, and pulmonary diseases (CDC 2010a, INSP 2009a, WHO 2009). These represent to the country a considerable usage of public funds in health treatments and less economic productivity –due to premature deaths and more sick people incapable of working. Therefore, tobacco consumption has two different viewpoints: a purely economic –i.e. production and employments– and a public health perspective that affects the economy

¹ Considered as national total production plus net imports.

² Around \$2.7 billion USD.

³ Worldwide, tobacco kills more than AIDS, legal drugs, illegal drugs, road accidents, murder, and suicide combined (Mackay and Eriksen 2002).

too –i.e. labor productivity⁴ and the usage of the public budget. The Mexican government, aiming to reduce tobacco consumption and its side-effects, has implemented two main policies: excise taxes on tobacco (IEPS, *Impuesto Especial sobre Producción y Servicios*) and preventive campaigns for its consumption –including some directed to firsthand and others to secondhand smokers. The economic effectiveness and costs of the former will be the main concern of this report.

Since early 1980s, tobacco in Mexico has been charged with excise taxes, adding extra burden to consumers –and to the industry– and increasing substantially its retail price to discourage its use. Even when tobacco tax changes have been justified with public health arguments, the increase for year 2010 was made so the government could augment its tax collection. Nonetheless, studies have revealed that these policies are effective in reducing tobacco consumption and, consequently, in preventing illnesses in Mexico and worldwide (Hu *et al.* 2008, Ross *et al.* 2009, Shibuya *et al.* 2003, Waters *et al.* 2010).

This report intends to analyze the economic effects that taxes on cigarettes have in Mexico. For this purpose, it will first be needed to explain tobacco consumption habits in the country –i.e. how many cigarettes are consumed and by whom– and the estimated cases of tobacco-attributable diseases. These will help understand how the industry affects the population, how many people get ill because of these products, and how much all of these cost to the health sector and society. Later, it will be needed to describe the tobacco economic perspective, including employment and revenues in the agriculture of tobacco leaves and in the manufacturing of cigarettes. Finally, the tax on tobacco will be explained to understand how it has been modified in the past years. Once identifying which are the costs and benefits of having a tobacco industry and a tobacco excise tax, their implications will be analyzed to propose solid public policies and to improve health standards in the country.

Essentially, IEPS's main cost to society is the reduction in tobacco industry's production –with a fraction of it accounted as deadweight loss–, which also leads to less employments and revenues to the economy. On the contrary, its main benefit is the reduction in tobacco-attributable illnesses, which means fewer expenses in treatments and an increase in labor productivity –in the short and long run. Government's tax collection, although it could be considered as a benefit because of its redistributive characteristic, it will not be taken as such, given that it can be seen as a zero-sum game⁵. Considering this information, costs and benefits will be analyzed in two scenarios: the study of the tobacco industry with the IEPS as it is at the moment, and how would the industry be without this tax –i.e. estimating a counterfactual scenario.

II. Tobacco Consumption in Mexico

For year 2008, the National Addiction Survey (ENA, *Encuesta Nacional de Adicciones*) showed that 35.6% of the Mexican sample⁶ have smoked at least once in their life –equivalent to 26.7 million people. Similarly, it revealed that there were 13.9 million of active smokers in the country –some 18.5% of the sample–, with a consumption average of 7 cigarettes per day –around 11.7% reported to smoke more than 16 but less than 25, and 3% to smoke more than 25 (INSP 2009b). Compared with Latin American countries, Mexico has smaller figures than Argentina –30% of active smokers–, Chile –37.9%–, and Uruguay –24%– (Waters *et al.* 2010).

⁴ Although, there could be other economic costs, like those related with losing family savings, investments, or goods because of having a sick member. As well, there could be social costs, such as kids dropping school –with all the long run side-effects that these may have in their quality of life– to help household's expenses, given a sick or death parent.

⁵ A situation in which a participant's gain or loss is exactly balanced by the losses or gains of the other participant(s).

⁶ People above 12 and under 65 years old.

Using worldwide estimations⁷, half of lifetime tobacco users will die prematurely⁸ and half of deaths will take place when they are between 35 and 69 years old (Mackay and Eriksen 2002). This represents that 6.9 million people in Mexico will die –if none of current active smokers quit in time– because of tobacco-attributable diseases and 3.45 million of them will do before their productive lives have ended.

On average, Mexican smokers began their habit when they were 17.1 years old⁹; particularly, teenage smokers started when they were 13.7 years old. Curiosity was the main reason to begin tobacco consumption for 60.0% of them and around 30.0% was due to family, relatives, and friends influence and/or pressure (INSP 2009b).

Particularly, men have a larger tendency to consume tobacco than women: respectively, 48.8% and 23.4% had used tobacco in their life, and 27.8% and 9.9% are still active smokers. In rural zones, consumption is lower: with 38.5% of men and 9.7% of women that have smoked at least once in their life, and with 20.2% of men and 2.9% of women that still do. Grouped by age, 8.8% of teenagers and 19.6% of adults are tobacco consumers (INSP 2009b). Divided the population in quintiles, the uppermost has around two times more probability of having a smoker member at home than the lowermost quintile (Waters *et al.* 2010).

From 1980s until late 1990s, cigarettes consumption in the country remained practically unchanged with an annual average of 2.6 billions packs sold, some 53.2 billion cigarettes. By 2006, this amount decreased only to 2.4 billion packs, representing 52.0 billion of cigarettes (Waters *et al.* 2010). This indicates a small consumption decrease in absolute numbers. Almost all tobacco products in the country are consumed in form of cigarettes (99.6% of total tobacco products' value), and the rest are in form of cigars or in other presentations (Waters *et al.* 2010).

For year 2008, 17.1% of the survey's sample –some 13 million people– considered themselves as ex-smokers. The average age to drop this habit was at 29 years old for men and 25.6 for women. Health care was the main reason to leave this habit for 38.4% of them, followed by tobacco satiation for 18.4% (INSP 2009b).

III. Public Health System and Tobacco-Attributable Diseases Costs

Mexico has a complex healthcare system, in which six different federal institutions provide health services to society¹⁰. Moreover, each of them has their own budget, their own administration and accountability, and their own target population. These institutions are named:

- Ministry of Health (**SSA**, *Secretaría de Salud*),
- Mexican Social Security Institute (**IMSS**, *Instituto Mexicano del Seguro Social*),
- State's Employees' Social Security and Social Services Institute (**ISSSTE**, *Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado*),
- National Defense Ministry (**SEDENA**, *Secretaría de la Defensa Nacional*),

⁷ No specific estimations for Mexico were found. Given this limitation, long run affects of tobacco consumption could not be made.

⁸ For the United States, smokers die 13 to 14 years earlier than nonsmokers, on average (CDC 2010b).

⁹ In the 1930s, average age to start smoking was of 20.6 years old.

¹⁰ Local governments and universities may also manage and support their own facilities, adding more complexity to the system.

- Navy Ministry (**SEMAR**, *Secretaría de Marina*), and
- Mexican Petroleum (**PEMEX**, *Petróleos Mexicanos*).

Although **SSA** is the ministry responsible of establishing health policies in the country, each institution has some independence because each has their independent budget –as already mentioned– and because each manages their own hospitals and health centers¹¹. For instance, **IMSS** receives two times more money than **SSA** (CEFP 2009). Nonetheless, given that listed institutions have their own target population –being different fractions of formal workers, including their families–, **SSA** has its own facilities to provide health services to those without these social security protections.

Adding all healthcare institutions, **IMSS** and **SSA** concentrate around 70% of the federal health's budget (CEFP 2009). The former, by itself, attended 53.9% of the users¹² in the country or 45.6 million people in 2008¹³; the latter did to 35.8% or 30.3 million people¹⁴ in the same year (SSA 2008). Given their national importance, this report takes special attention to these two institutions. Although, it is worth to mention that there is also a considerable data limitation in the other institutions for current subject.

Reynales Shigematsu *et al.* (2006) made a study that estimated **IMSS's** expenditures for tobacco-attributable diseases. CMCT (2010) expanded these results by including figures of four **SSA's** institutes¹⁵ and of **SEDENA**, and by updating **IMSS's** disbursements. Both researches only focused in four different sicknesses –although there could be more in this list–, being:

- Acute myocardial infarction (AMI)
- Chronic obstructive pulmonary disease (COPD)
- Vascular brain disease (VBD)
- Lung cancer (LC)

According to Reynales Shigematsu *et al.* (2006), **IMSS** attended 45,187 new cases of these diseases in 2004; while according to CMCT (2010), **SSA** attended 2,645 new cases in 2009. Differences between **IMSS** and **SSA** figures are attributed to their respective budget and infrastructure differences –although they are also for different years.

In total, expenditures related to treat tobacco-attributable diseases were of \$9,100.7 million MXN for **IMSS** and of \$557.0 million MXN for **SSA**, both in 2009 (CMCT 2010). Unfortunately, **IMSS's** figures reported in CMCT (2010) are not divided by diseases; so, to compute unit treatment costs for tobacco-attributable illnesses, it was used the information from Reynales Shigematsu *et al.* (2006) that was for year 2004 –making them real MXN of 2009. The assumption made is that the number of cases remained constant, as well as its unit expenditures, from 2004 to 2009.

¹¹ Besides, each provides non-health services, such as pensions; something that **SSA** does not.

¹² Those that demanded, at least once in the year; a health service.

¹³ Including *IMSS-Oportunidades*.

¹⁴ Including *Seguro Popular*.

¹⁵ Breathing Illnesses Institute (INER, *Instituto Nacional de Enfermedades Respiratorias*), Cardiology Institute (INCAR, *Instituto Nacional de Cardiología*), Neurosurgery Institute (INNIN, *Instituto Nacional de Neurología y Neurocirugía*), and Cancerology Institute (INCAN, *Instituto Nacional de Cancerología*).

Table I shows the amounts designated for both institutions for each tobacco-attributable disease, with their respective number of cases. For instance, the most significant cost for IMSS was the attention to AMI; it represented 61.2% of all tobacco-attributable expenditure. In contrast, the highest cost for SSA was the attention to LC, equivalent to the 56.2% of its expenditure.

Table I. Tobacco-attributable expenditures and number of cases

(Real MXN of 2009)

Disease	Million		Number of cases	
	IMSS	SSA	IMSS	SSA
Chronic obstructive pulmonary disease	\$1,245.50	\$36.50	10,152	508
Acute myocardial infarction	\$5,337.11	\$195.20	24,323	1,550
Vascular brain disease	\$2,053.55	\$12.70	10,263	297
Lung cancer	\$82.24	\$312.60	449	290
Total	\$8,718.39	\$557.00	45,187	2,645

Source: Based on Reynales Shigematsu *et al.* (2006) and CMCT (2010).

Table 2 displays the unit cost of each before mentioned tobacco-attributable disease for IMSS and SSA –i.e. basic cost-effectiveness analysis. Particularly, for COPD, AMI, and VBD, IMSS had larger treatment costs than SSA: respectively, they were 73.7%, 74.2%, and 366.4% higher. In contrast, IMSS was more effective in attending LC: being its figure 83.0% smaller than SSA's.

Table 2. Basic cost-effectiveness analysis

(MXN of 2009)

Disease	Thousand per case		Percentage
	IMSS	SSA	Difference
Chronic obstructive pulmonary disease	\$122.69	\$70.63	73.7%
Acute myocardial infarction	\$219.43	\$125.95	74.2%
Vascular brain disease	\$200.09	\$42.90	366.5%
Lung cancer	\$183.15	\$1,078.17	-83.0%
Average	192.94	210.40	-8.3%

Source: Own estimations.

Governmental expenditure destined to treat tobacco-attributable diseases, according to CMCT (2010), was of \$45.0 billion MXN in 2009; although, it was only accounted \$9.8 billion MXN from SSA, SEDENA, and IMSS –the most important health institutions. Additionally, Quintana *et al.* (2010) have preliminary results –it is not a published work yet– that these illnesses cost to the government between \$23.0 and \$43.0 billion MXN –around 6% and 15% of public health's budget– for the same year. They also estimated that labor productivity reduction for IMSS's workers was of \$69.0 million MXN in 2009. For this document, conservative tobacco-attributable health expenditures will be those accounted by CMCT (2010); moderate estimations will be the lower bound of Quintana *et al.* (2010); and highest estimations will be the upper bound of this same report. Table 3 resumes tobacco-attributable expenditures estimations.

Table 3. Governmental expenditure for tobacco-attributable diseases

(MXN of 2009)

Scenario	Expenditure estimated	Source
Conservative	\$9.8 billion	CMCT 2010
Moderate	\$23.0 billion	Quintana et al. 2010
High	\$43.0 billion	Quintana et al. 2010

Source: Own estimations.

It is important to consider that, besides the public sector, households may also use part of their income in health services. Using estimations made by EGAP (2010), from the total disbursements addressed to this sector, around 50% comes from public institutions and the other half comes from privates. Considering this proportion, and the information stated above, tobacco-attributable expenditure amounts could double.

IV. The Economy of Tobacco

The tobacco industry in Mexico is a duopoly, where British American Tobacco (BAT) and Philip Morris (PM) control 95% of the market. Currently, PM's *Marlboro* is the top selling brand in Mexico, representing 47.7% of all cigarette sales in 2006; it is followed by BAT's *Boots* with 8.8%. PM has kept and increased its leadership in the Mexican tobacco industry since 2000 to 2006, passing from 55.7% to 63.7% of participation in the market. In contrast, BAT has decreased its presence in almost 11%, in the same period, passing from 42.2% to 31.3% (Waters et al. 2010).

In the last decades, harvest of tobacco leaves has decreased considerably in Mexico, having nowadays only 0.05% of agriculture areas cropped for this product. For instance, its national production has decreased from 59,570 tons in 1994, down to 11,142 tons in 2008. The employment in this sector has also decreased, passing from almost 20,000 employees in 1993, to just 6,000 in 2007. In contrast, tobacco leaves imports have increased considerably from 7,728 tons in 1994, up to 28,239 tons in 2008 (Waters et al. 2010).

Employees related to tobacco manufacturing represent around 0.4% of manufacturing employments. As well, its figure has decreased in the last decades, passing from 8,100 employees in 1994, to 4,374 in 2009. Nonetheless, its gross production has increase in the last decade, passing from \$16.2 billion MXN in 1999, from \$19.7 billion MXN¹⁶ in 2004, to \$33.4 billion MXN in 2009 (INEGI 2009). From 1994 to 2008, the annual average of cigarettes packs is 2.7 billion.

V. Tobacco Taxation

Since early 1980s, tobacco products have been charged with special taxes: additionally to firms' Income Tax (ISR, *Impuesto sobre la Renta*) and sales' Value Added Tax (IVA, *Impuesto al Valor Agregado*), it also burdens an excise tax named IEPS. Its rationale is that consumption of these products has injurious side-effects, forcing the government to increase its tax collection to correct their public health consequences. Although, IEPS increase for year 2010 was driven by the global and Mexican economic crises, where the government needed extra revenues for the its public budget. Regardless of its motivation, this kind of

¹⁶ Real MXN of 2009.

taxes have proved their effectiveness in reducing tobacco consumption and, consequently, in tobacco-attributable diseases (Hu *et al.* 2008, Ross *et al.* 2009, Shibuya *et al.* 2003, Waters *et al.* 2010).

IEPS was first introduced in 1981, having an *ad valorem* figure of 139.3% and excluding unfiltered cigarettes of this burden. These last were treated differently with the political justification that they were consumed, in a larger proportion, by the poorest population –which the government did not want to affect. It was until year 2000, when they were first taxed by a 20.6%, and then increased gradually until they reached 110% in 2005. Afterwards, their special treatment disappeared, having both types of cigarettes converged to the same *ad valorem* figure. Currently, tobacco excise tax is of a 160%. Only hand-made cigarettes are differentiated with a smaller tax of 30.6%, arguing that it will protect employment –given that these companies are labor intensive. Moreover, if cigarettes are imported from countries without a commercial treatment, they will also have a 67% tariff.

Last IEPS increases, which has planned changes for the following years, consisted in adding –besides current *ad valorem* figures– a specific tax of \$0.80 MXN per pack of 20 units in 2010 and increasing it gradually up to \$7.00 MXN in 2013. Although this specific tax could represent more revenues to the government, if they are not indexed to inflation, its collection will slowly decrease in real terms as time goes by. In 2008, the income related to tobacco taxes was 32.4 billion MXN: 25.5 billions of those were from IEPS and the rest 6.9 billion were from IVA.

Table 4 illustrates price changes, from producer’s initial cost, up to consumer’s final price. There could be seen that cigarette packs in Mexico are overpriced in 61.37%, considering both IVA and IEPS. It is still relative small compared with Uruguay and Chile that have figures of 68% and 76%, respectively.

Table 4. Tax structure in 2009

(average pack)

Concept	Average per pack
Retailers' price: before IEPS	8.01
IEPS (160%)	12.82
Retailers' price: after IEPS (160%)	20.83
Retailers' gain	2.23
Price with retailers' gain	23.06
IVA (15%)	3.46
Final public price	26.52
IVA (% of price)	13.04%
IEPS (% of price)	48.33%

Source: Based on Waters *et al.* 2010

Table 5 displays price tendency of cigarettes in Mexico, considering tax burden changes since 2001 until 2009. Overprice in cigarette packs has changed from 52.3% to 61.4%, being IEPS share of around 48.3% points in 2009.

Table 5. Cigarettes' Price Tendency

(Percentage and nominal MXN)

Year	IEPS (Retailer's price percentage)	IEPS (Consumer's price percentage)	IEPS + VAT (Consumer's price percentage)	Average real price of a cigarette pack (2009)
2000	100%	39.3%	52.3%	\$10.50
2001	100%	39.3%	52.3%	\$11.60
2002	105%	40.2%	53.3%	\$13.30
2003	107%	40.6%	53.6%	\$14.30
2004	110%	41.1%	54.2%	\$15.80
2005	110%	41.1%	54.2%	\$18.10
2006	110%	41.1%	54.2%	\$19.60
2007	140%	45.8%	58.9%	\$21.80
2008	150%	47.1%	60.2%	\$24.00
2009	160%	48.3%	61.4%	\$26.50

Source: Waters *et al.* 2010.

VI. IEPS's Economic Costs and Benefits

VI.1. Costs

Waters *et al.* (2010) estimated that tobacco price elasticity, for the demand side in Mexico, was of -0.55 in 2006 and of -0.70 in 2008. These could represent that current overprice of 48.3% (see **Table 4**; IVA not included¹⁷) have produced a consumption reduction between 26.6% and 33.8%. For the industry, given its current gross production of \$33.4 billion MXN, this means an economic loss amid \$12.1 billion and \$17.0 billion MXN¹⁸. It is important to mention that these figures could only be accounted as a tax's cost if resources are not reallocated in other industries, as perfect competition predicts.

Another cost that any tax creates is the loss of the consumer surplus. Although, most of it is translated to tax collection from the government –notice the constant marginal cost assumption from tobacco firms–, ending in a zero-sum game. So, from the \$32.4 billion MXN collected by the government through tobacco taxes –\$25.5 billions MXN from IEPS and other \$6.9 billion MXN from IVA–, none would be considered either as cost or benefit.

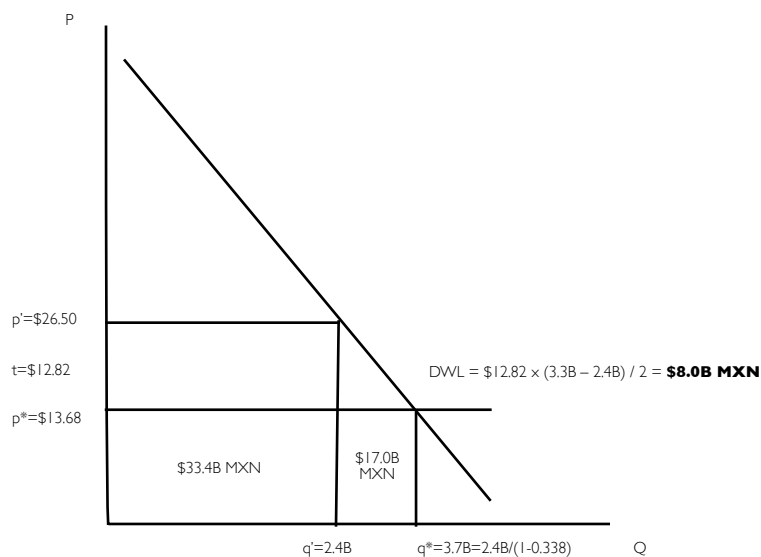
To evaluate the deadweight loss, it would be needed some back-of-the-envelope estimations, given current data limitations. Future demand curve computations will be made to improve this figure. For instance, **Graph I** will help for this purpose.

¹⁷ It is not a specific tobacco tax.

¹⁸ Elasticity price estimations for the supply side are not available, given that information needed is private. This preclude to obtain an accurate production loss because of the tax. In view of this limitation, it will be assumed that tobacco companies have constant marginal costs.

Graph I. Deadweight loss

(B = Billion, year 2009)



Source: Own estimations.

Table 4 displays that, for year 2009, the average IEPS was of \$12.82 MXN, with an average consumer's price of \$26.50 MXN –therefore, the equilibrium price should be of \$13.68 MXN. Section II indicated that there were about 2.4 billion cigarette packs sold in the same year. Using these figures, it could be shown that gross production of this industry was of around \$33.4 billion MXN –similar to numbers from INEGI (2009). As well, with elasticities computed by Waters *et al.* (2010), it could be estimated that production could reach up to 3.7 billion cigarette packs, if IEPS was not present. All the above helped to estimate the deadweight loss of \$8.0 billion MXN for year 2009. Similarly, this estimation could get down to \$5.6 billion MXN if elasticity for year 2006 is used. The biggest assumption here is that the demand curve is linear; if this is relaxed, figures would necessarily be lower.

VI.2. Benefits

INSP (2009c) estimations revealed that, if cigarette packs had an average overprice of 48.3% in Latin America, it would reduce in 19.3 million the number of smokers and in 4.8 million the amount of deaths by tobacco-attributable diseases in the region. Although, there is no economic figures of these and computing them with current information may burdens heavy and questionable assumptions. So, it would be assumed that the before mentioned consumption reduction –according with estimated demand price elasticity of Waters *et al.* (2010) in previous section– have represented that same amount of reduction in public health expenditure and in labor productivity. Given that there are three different scenarios, with their upper and lower bounds, **Table 6** will be used to concentrate all figures. As shown, having a tobacco excise tax in Mexico has an estimated benefit between \$3.5 and \$22.0 billion MXN per year –without considering private expenditure in tobacco-attributable diseases.

Table 6. Public Health Expenses and Productivity –IEPS’ Benefit–
(Year 2009, billion MXN)

Scenario	With IEPS		Without IEPS		Benefit	
	Public Health Expenses	Productivity	Estimated Costs (Upper)	Estimated Costs (Lower)	Upper Bound	Lower Bound
	A	B	C= (A+B)/(1-.266)	D= (A+B)/(1-.338)	C-(A+B)	D-(A+B)
Conservative	\$9.8	\$0.069	\$13.3	\$14.7	\$3.5	\$4.9
Moderate	\$23.0	\$0.069	\$31.3	\$34.7	\$8.3	\$11.7
High	\$43.0	\$0.069	\$58.6	\$65.0	\$15.6	\$22.0

Source: Own estimations.

VI.3. Cost-effectiveness Analysis

Table 7 displays the cost-effectiveness ratio for the three different scenarios. If ratio ends minor to 1, it could be considered that the policy has a positive impact to society; in contrast, if it ends higher than 1, it could be considered as having a negative affect. Given that there is an upper and lower bound for benefits and costs –meaning a large set of results–, it would only be displayed the maximum and minimum possible ratios –i.e. upper benefit with lower cost and lower benefit with upper cost.

Table 7. Cost-effectiveness ratios

Scenario	Upper Cost / Lower Benefit	Lower Cost / Upper Benefit
Conservative	2.26	1.14
Moderate	0.96	0.48
High	0.51	0.26

Source: Own estimations.

Regarding the conservative scenario, IEPS costs to society are larger than their benefits: the former could be two times bigger than the latter. Although, for the rest of scenarios, IEPS burdens more benefits than costs –i.e. revenues lost from tobacco industry are lower than what the government have saved from tobacco-attributable expenditure reduction. This means that markets distortions do not outweigh benefits from tobacco consumption diminution that IEPS generates.

Table 7’s results can be changed if next considerations are accounted:

- Private expenditures for tobacco-attributable diseases
- Long-run estimations for costs and for benefits

Notice that with public information –no counterfactual estimations–, this industry produces \$33.4 billion MXN and the government spends, in the highest scenario, some \$43.0 billion MXN. This shows

that the industry, as a whole, could not be cost-effective to society, having larger externalities than what it contributes to the economy.

VII. Conclusions

Tobacco generates substantial costs to society, materialized in public health side-effects –either by tobacco-attributable illnesses and/or by deaths. As shown, there are scenarios where public health expenditures for this purpose are higher than what the industry produces as a whole –even when private disbursements are not accounted. Therefore, tobacco is a burden for society's wealth and, especially, for the health of Mexicans, in which the government should play an active role. How legitimate is an industry where its social costs are larger than its gross production –assuming it is a net benefit to society–? The industry counts with only 10,000 workers and produce 48,000 new cases of tobacco-attributable diseases and the death of 25,000 and 65,000 people each year.

IEPS is an instrument used by the government to obtain resources by persuading, at the same time, a tobacco consumption reduction. Considering only its effects, some scenarios conclude that its benefits –its goal to reduce public health side-effects– do not outweighs its costs –its distortion in the market. In other words, it could damage the economy more than what it corrects tobacco's externalities. Nonetheless, there are other situations where cost-benefit ratio is smaller than 1 –as the public health expenditure increases, the smaller the ratio gets. Further research to have these figures the most accurate possible is still needed to be done, with the support of the Ministry of Health or other public dependencies.

If health expenditures are smaller than industry's production, one possibility to reduce social costs is to force tobacco firms to take care of all tobacco-attributable diseases expenditures. But, if public and/or private expenditures are larger, should the government forbid tobacco products? Should they be as illegal as marihuana, cocaine, or other similar drugs? When a product should enter this illegal zone?

Further research should be made regarding the computation of accurate benefits in the short- and long-run. It is needed to know how many people will not get sick –and will not use part of public health's budget–, given an overprice in cigarette's packs. Until now, it is only an educated estimation, using other figures as approximations. As well, private estimations where not accounted given limitations of information.

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