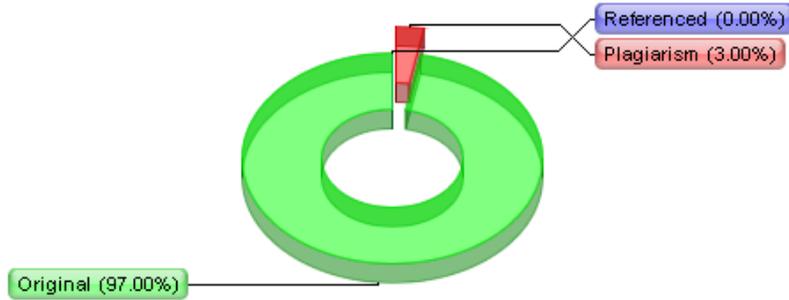# Plagiarism Detector v. 1092 - Originality Report:

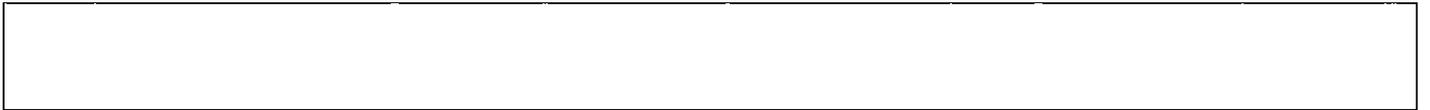Analyzed document: 19/08/2019 13:47:04

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Impact of the Free Trade Zone on Cigarette Consumption: An Examination of Indonesian Households
Mohtar Rasyid
11
Trunojoyo Madura University, Jl.Raya Telang Kamal, Bangkalan 69162, IndonesiaABSTRACT
Objective - The purpose of this research is to evaluate the impact of the Free Trade Zone ('FTZ') in the Riau Islands Province (Batam, Bintan and Karimun) on specific products, i.e. cigarettes.Methodology/Technique - To investigate the demand for cigarettes in the FTZ area, this study examines data on cigarette consumption in Batam and surrounding areas before and after the implementation of the FTZ. The data is collected from SUSENAS surveys conducted in 2003, 2005, 2008, 2011 and 2014. To examine the net impact of the FTZ, this study also uses an experimental approach; the implementation of the FTZ can be viewed as a natural influence on a decrease in prices of specific products. The subject group includes households in the Riau Islands Province. Households in the surrounding provinces are therefore used a control groups. Several indicators were used to identify and establish the control groups, including: cigarette consumption, population, sex ratio, life expectancy and education level. Following this criteria, Bengkulu Province was selected as the ideal group of control candidates.Findings - The results show

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that there has been a significant increase in

cigarette consumption in the Riau Islands Province following the implementation of the FTZ.Novelty - The introduction of the FTZ means that trade commodities, including cigarettes, are no longer subject to excise duty. As a result, the selling price of tobacco products has become very cheap.Type of Paper: Empirical.Keywords : Cigarette Tax; Free Trade Zone; Indonesian Households; Natural Experiment.JEL Classification: F10, F13, F19.

1. Introduction

The classification of three areas in the Riau Islands - Batam, Bintan and Karimun ('BBK') - as

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 "Free Trade Zones"

is expected to have a positive impact on investment value in the region. Given their strategic location, being directly adjacent to Singapore and Malaysia, these localities are positioned directly in the middle of major international trade (for example, between Singapore, India, China and Australia), hence, the FTZs have the potential to become majorly competitive area of trade, if properly supported by competing infrastructure facilities.

Mohtar Rasyid

As a consequence of the classification of BBK as a FTZ, many tradable commodities, including also cigarette products, no longer attract excise duty. From an economics point of view, cigarette sales in BBK will likely increase considerably following the provision of excise-free facilities. Data from the Survei Sosial Ekonomi Nasional Surveys ('SUSENAS') records cigarette consumption in Batam in 2008 at around 650 million cigarettes; this increased sharply three years later in 2011, to around 928 million cigarettes.

However, as a commodity with considerable investment qualities and employment opportunities, the sale of tobacco products remain a controversial topic. Despite its important role as a source of government revenue, cigarettes are also known to be harmful to consumers. Thus, as policymakers, the government is expected to implement laws that ensure optimal consumption levels are achieved such that any decrease in cigarette consumption is compensated by the benefits arising from tobacco consumption itself. One such instrument is laws imposing excise duties on cigarettes. However, excise instruments cannot be applied as a tool to control the consumption of cigarettes in free trade areas such as Batam, Bintan and Karimun. This means that manufacturers and cigarette vendors can sell cigarettes at a much cheaper price than elsewhere. As a result, national cigarette manufacturers, who previously only supplied to surrounding areas, are now supplying cigarettes in Batam and surrounding areas.

This paper is organized as follows: the second section outlines the relevant literature on the area, and the basic concept of the study. The third section will discuss the methodological issues and the fourth section will describe the data obtained from the sample households in Indonesia, which was obtained from the SUSENAS for several waves. The final section discusses the general results obtained and conclusions from the study.

Literature Review 2.1 Basic Concept

The conventional approach to smoking behavior may not be sufficient to justify cigarette regulation. In this respect, Gruber (2003) describes several important points. First, the assumption that smokers have a complete awareness of information surrounding smoking cigarettes is doubtful. Beginner smokers may have have obtained considerable information about the dangers of smoking however, may be less aware of the consequences of

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 "addiction"

as a result of smoking. One survey shows that of the 56% of teens who say they will not smoke in the next five years, only 31% actually quit smoking five years after the first survey. In contrast, as much as 72% of teenagers claimed to be smokers, while in fact around 74% of teens are active smokers. Secondly, active smokers in practice find it difficult to actually quit smoking, even though they express a real desire to quit. Both the conventional and the new approach to cigarette consumption support the government's role in regulating cigarette prices. However, the arguments raised by both sides may be different. For instance, the conventional approach places more importance on the external factors of smoking, while the new approach emphasizes the importance of excise instruments as a control on cigarette consumption. Further, variation

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 in the price of cigarettes tends to be higher for poor households compared to rich households. Hence,
 increasing the purchase price of ci

garettes will likely reduce cigarette consumption significantly among poor households. Similarly, price variation for cigarettes is relatively higher for adolescent smokers when compared to adult groups. From a conventional perspective, the imposition of excise duty will actually cause consumers of cigarettes to be worse off. Conversely, from a new perspective (who support the use of excise as a control), the imposition of excise has positive implications for smokers. Further discussion on this is found in Grubel and Mullainathan (2002).

2.2 The Effect of Cigarette Tax on the Demand for Tobacco Products

The imposition of excise on some commodities is aimed not only at controlling consumption and production of those commodities (Adda and Cornaglia, 2006), but also to serve a social purpose in the allocation of budgets as a consequence of that consumption, which cannot be calculated privately. The

11

J. Bus. Econ. Review 2 (4) 10 - 17 (2017)

Mohtar Rasyid

imposition of excise tax has an immediate effect on prices. Certain goods or services are often categorized as goods that are harmful to health. However, the government is not always able to prohibit the consumption of these goods; one such example is cigarettes. Smoking in certain public places (such as hospitals and schools) is prohibited however, the government cannot ban cigarette consumption across the board. One way that governments can indirectly regulate or control the consumption of cigarettes is by manipulating prices.

The imposition of excise duty causes a decrease in Consumer Surplus ('CS'). Consumer Surplus is only the size of the CS triangle. Some Consumer Surplus is used as government revenue, as indicated by the Tax Revenue rectangular. A further portion of the lost Consumer Surplus is contributed toward the Dead Weight Loss ('DWL') triangle. This reflects the inefficiency of excise. The effect of sales excise can not only be used to analyse the effects of excise duty, but also to calculate the effect of imported goods tax as well as other floor pricing policies set by the government. In essence, the government can apply this policy to control circulations of certain products in the marketplace (Mankiw, Weinzierl, and Yagen, 2009).

Lockwood and Taubinsky (2015) have developed a regressive sin tax model using cigarette consumption

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data in the United States.

Their simulation results show

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that the elasticity of demand for

cigarettes varies among different income levels. Generally, the effect of optimal sin tax is significant on the various simulation results, however the significance level decreases when the redistributive element is internalized in the model. Meanwhile, O'Donoghue and Rabin (2006) confirm Grubel's (2003) thesis on self-control elements in the consumption model of cigarettes. Unlike most consumption tax models for public goods, this research found that high taxation on sin commodities, or un-healthy items, may not

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"hurt"

consumers where the intended consumer struggles to exercise with self-control, and there is therefore no reduction in cigarette consumption. In short, higher taxation is

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"beneficial"

for consumers as an effective for the reduction of cigarette consumption (Gruber and Mullainathan, 2002).

To date, research on cigarette consumption in Indonesia is relatively limited. In the last three years, it has concentrated on two main issues: the problem of customs breaches and the optimization of state revenue from cigarette taxes. Studies conducted by PSEKP UGM (2014) and MD FEB UGM (2015) generally found that the violation of cigarette taxes in various forms is still relatively common. Violations in the use of these excise rules results in significant losses to the state. Meanwhile, research on the optimization of state revenue from cigarette excise has been conducted by MD FEB UGM (2016), using a laboratory experimental approach.

3. Research Methodology

The basic problem of impact evaluation is counter-factual unavailability: the situation that would occur if the program recipient did not receive the program in the post-program period. Since program recipients cannot be in different conditions at one point in time, this counter-factual existence becomes so complicated that is requires the use of a conventional approach. One way to deal with a counter-factual is to conduct a randomized experiment (Khander, Koolwal, and Samad, 2010). Consider the following illustration: Figure 1 shows an illustration of impact evaluation by measuring the difference in outcomes between beneficiaries (participants) and non-recipients (control). The difference between post-program outcomes (Y_2-Y_1) occurs as a result of the program. Solving the counter-factual is therefore possible with a randomized experiment approach. Several methods for conducting impact evaluations have been developed by experts using a quasi-experiment approach. Some methods used include matching, double difference and instrumental variables.

12

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Mohtar Rasyid

Mathematically, the double-difference (DD) method can be expressed as follows:

(

|)(|)(1)Figure 1. Double Difference

In this case, indicates the presence of treatment (program) in period 1, while represents non-treatment in period 1. The DD coefficient reflects the average

change in outcome of the program beneficiaries, with the average change

in the control group used as the baseline for the length of the program. For more details please note the illustration in Figure 4. During the baseline period, the participant's income

is

while the control group's income is. During the program, the participant and control group earningsare andrespectively. Following the formulation of (1), the co-efficient of DD is as follows:(

)()(2)The DD approach assumes that the difference in characteristics (both observed and non-observed) among the treatment groups and control groups has created this group's second gap outcome in the baseline period

(

), which will be time-invariant until the post-program period. This assumption carries theimplication that ()(). Thus, the impact of the program through the DD approach becomes(

) The central assumption of the DD approach is that other factors outside the program areassumed to not change over time.

4. Results and Discussion

As a new city that continues to grow, Batam has multiple lucrative investment opportunities. In addition to the ease of taxation, Batam has experienced rapid growth, particularly with respect to migration levels. In 2008, the population of Batam City was approximately 824,964. In 2012, the population had increased to approximately 1,123,690 (BPS Batam, 2014). Growth in populations among the areas surrounding Batam contributed to the ultimate growth in Batam itself. The 2010 BPS census reported the number of households in Batam as 256,033, while in Bintan Regency it is around 36,589. In the same year, the number of households in Karimun Regency was 51,659.

Batam is also an attractive destination for foreign tourists, particularly those from Singapore. Singaporeans take particular joy in the ease with which they can smoke cigarettes in public in Batam: an island without strict smoking rules, providing relatively inexpensive cigarettes, plus the discretion to throw cigarette butts everywhere. The potential of Batam can be estimated through the population in the area. As a rough illustration, one-third of Batam's populations are active smokers, consuming at least one pack per week. If each pack of cigarettes contains at least 12, this amounts to 1.5 billion cigarettes each year in Batam alone .

13

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To obtain data on cigarette consumption in Batam for the period before and after the implementation of the FTZ, this paper uses the SUSENAS micro data obtained in 2003, 2005, 2008, 2011 and 2014. Figure 2 presents the data of household cigarette consumption in Batam between 2003 and 2014. The consumption of cigarettes per week in 2003 was approximately 9.3 million while in 2005 this increased to about 10 million cigarettes. These numbers continued to increase until 2008, where the consumption of cigarettes reached approximately 12 million. Then, following the implementation of the FTZ, there was a stark and significant increase in cigarette consumption. In 2011 cigarette consumption rose to 17.8 million per year, and has continued to increase, now exceeding over 26 million cigarettes per year. This clearly indicates that the FTZ has had a significant effect on cigarette consumption in Batam.

Figure 2. Cigarette Consumption (week/stick)

This increase in cigarette consumption is not only occurring in Batam. To evaluate the full effect of the FTZ, it is necessary to conduct tests, taking into account the counter factual. With this in mind, the control unit must have a similar character to the treatment unit. In

addition, in the case of

the FTZ, the control unit is not directly affected by the sale and purchase of inexpensive cigarettes in Batam. To meet these requirements, the analytical unit used is at the provincial level. As one of the administrative cities in Riau Islands Province, Batam contributes around 43% of the population and contributes most to the economic condition of all of the provinces. In this regard, the selected provinces are all provinces on the island of Sumatra. A number of key indicators are then identified, to determine the similarity of control provinces with the Riau Islands Province as the treatment provinces. The key indicators used in this study were cigarette consumption in the base year, population, sex ratio, life expectancy and education level.

The population figures shown in Table 1 are calculated per million whilst cigarette consumption is measured in packs per week. Life expectancy in the average year and the participants' level of education (Education) is measured with reference to the percentage of the female population that have graduated from college to graduate school. All indicators are measured in the same base year, being 2011. All of these quantitative indicators are packaged into an index that best describes the score for each province. Given that the indicators all have different units of measurement, the first step is

to standardize the value of the variables. Furthermore, the value of each variable is deducted by the variable value of the

Riau Islands Province, to measure the difference of each provincial control with the provincial treatment. Through this process, the total score for the Riau Islands Province will be equal to zero. Meanwhile, the scores for the other provinces are determined by positive or negative deviations of each indicator on the Riau Islands indicator. After the horizontal score indicator is added, the difference of the scores for each province can be directly seen from the size of the score obtained.

14

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Mohtar Rasyid

Table 1: Key Welfare Indicator

Province	Code	Population	Consumption	Sex Ratio	Life Expectancy	Education
Aceh	11	4.715	7.33	99.49	69.4	10.18
Sumut	12	13.408	7.44	99.46	67.6	7.11
Sumbar	13	5.000	7.86	98.29	67.8	9.00
Riau	14	5.879	8.55	105.8	70.3	7.85
Jambi	15	3.227	8.02	104.24	70.0	6.31
Sumsel	16	7.714	7.07	103.33	68.5	6.57
Bengkulu	17	1.784	8.08	104.24	68.0	8.75

Lampung
18
7.835
6.29
105.61
69.1
4.87
Babel
19
1.287
8.80
107.69
69.3
5.71
Kepri
21
1.805
7.91
104.99
68.6
8.45

Source: BPS, Welfare Indicator, 2015

The bigger the difference in the scores, the greater the difference between the selected province and the Riau Islands Province (Kepri). Furthermore, the provinces are ranked to determine their position with respect to the province of treatment.

Table 2: Score Difference

Nomor	Province	Difference	Ranking
1	Aceh	5.23734	7
2	Sumut	7.42328	9
3	Sumbar	4.25609	3
4	Riau	4.44661	4
5	Jambi	3.59342	2
6	Sumsel	4.51308	5
7	Bengkulu	1.31124	1
8	Lampung	6.74690	8
9	Babel	4.63152	6

Source: Author's Calculation

Based on the above calculations, Bengkulu Province achieved the lowest score. Thus, Bengkulu Province can be used as a control province because it has a higher welfare indicator which is closest to the Riau Islands Province. The next closest province is Riau, however the difference in scores is relatively large, and hence only the Bengkulu Province is used for comparison.

15

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Mohtar Rasyid

Figure 3. Net Impact of FTZ in Kepri Province

Figure 3 illustrates the impact of the implementation of the FTZ on cigarette consumption in the Riau Islands Province. In the base year (2011), cigarette consumption in the Riau Islands Province (Kepri) and Bengkulu (Bengkulu) were relatively similar. The official data (SUSENAS) shows that the average consumption in Bengkulu in 2011 was 8.08 packs per week. Meanwhile, the average cigarette consumption in the Riau Islands reached 7.91 packs per week. As a result of the dispersal of Batam cigarettes in the Riau Islands, the average cigarette consumption in the Riau Islands rose in 2014 to 8.56 packs per week. In the same year, cigarette consumption in Bengkulu reached 8.15 packs per week. Therefore, the introduction of the FTZ in the Riau Islands has resulted in an increase in cigarette consumption by 0.65 units. However, given that the increase of cigarette consumption may also be caused by other factors (such as an increase in income, appetite, addictive factors, etc.), a calculation that takes into account these

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factors results in the impact of the FTZ on c

onsumption at an average of 0.57 units. In other words, it can be said that the existence of the FTZ provides an opportunity for the sale of cigarettes without excise (cheap cigarettes) causing the average consumption among the popilation to increase by approximately 0.5 packs per week in every household.

5. Conclusion

This study analyzes the impact of the FTZ on commodities that have unique specifications, such as cigarettes. This study is unique as cigarette sales have a significant contribution toward government revenue, and cigarettes are also a source of concern with relation to the health of consumers. This study reveals that, following the introduction of the FTZ, cigarette consumption in Batam has increased drastically. This has also widely occurred in the Riau Islands Province. This study found that, on average, there is an increase in consumption by 0.5 packs, or the equivalent of 6 to 9 cigarettes, per week per household. This figure is not insignificant, as the population in Batam and surrounding areas continues to grow.

Acknowledgements

16

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Mohtar Rasyid

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