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# The coffee problems: The impact of tax imposition on coffee across social classes in the Philippines

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Keywords: coffee, tax imposition, social classes

## ABSTRACT

This paper examined the impact of tax imposition on coffee among the different socioeconomic classes in the Philippines. This study employed the use of Ordinary Least squares (OLS) method to develop an estimator for the impact of the said imposition. The results show that even if lower socioeconomic classes have less amounts expended on their coffee consumption, its allocation over their total household expenditures is greater compared to the upper income Filipino classes. Consequently, it is the poor who shall mostly incur the burden of additional taxes when the latter is imposed by the legislative branch of the government.

Keywords: coffee problem, tax imposition, social class, Philippines

## Introduction

As claimed by Starbucks, coffee is considered as the second most valuable traded commodity in the world, next only to petroleum. With approximately 25 million farmers and coffee traders in over 50 countries, coffee producers are kept in a cycle of poverty and debt (Jeffrey, 2003) by the current global economy designed to exploit cheap labor and keep consumer prices low.

According to the Department of Agriculture, the Philippines exported as much as US$ 100 million every year during the 1980's until the collapse of the International Coffee Agreement in 1989 following the drastic fall in prices due to an oversupply in the world market. During the past two decades, exports were highly variable. In 2011, volume stood at 405 tons, down by 30.7% from 2010. On the other hand, value increased by 8.5% from US$ 1.5 million in 2010 to US$ 1.6 million in 2011. Of the total export value in 2011, extracts, essences, and concentrates of coffee accounted for 70%, while ground roasted coffee accounted for 29%. The leading buyers of coffee, by value, include South Korea at 29%, China at 24%, and Thailand at 11%, US at 10% and Netherlands at 3%. Since 2014, the Philippines has been producing about 25,000 tons of coffee annually but imports twice or three times that volume to meet the local demand. Demand grows at about the same as the population rate of three to five percent (Imbong, 2014).

The total estimated demand for coffee is about 100,000 mt. and about 75,000 mt. imported annually but official statistics place the number at 44,000 mt. Roasted coffee alone is growing at about 10 to 15% while 3-in-1 coffee is increasing by 20 to 25% though a 15-gram sachet only contains about 2 to 3 grams of coffee. Whether coffee is commercialized or the usual 3-in-1 pack, the demand for coffee, in general, is in an increasing trend in our country (Isip, 2014).

At present, the production of coffee is slowly moving to the Mindanao region, as driven by the rising cost of real properties in provinces like Cavite, which mainly cater to coffee production. However, it was estimated by the Philippine Coffee Board Inc. (PCBI) that only 4,000 hectares of land remain planted with coffee in the said area currently. Each of these hectares of farmland costs about P7 million. Hence, farmers are forced to plant other types of crops that have bigger returns or offer to sell their farmlands to property developers. Thus, on one hand, the poor have always relied on coffee drinks as their morning routine – drinking coffee before farming, before fishing, or before doing any household chore. On the other hand, ever since coffee has been highly commercialized in the country since 1997, the middle to upper classes had better access to on-the-go coffee drinks, whether hot or on iced, as they go about their day.

From the background presented, this study, thus, hoped to determine the incidence of additional tax imposed on coffee. The main evaluation question that this study attempted to answer was: What is the impact of imposing taxes among the different social classes in the Philippines?

As reported by Bloomberg, according to the International Coffee Organization in London, retailers raised prices on coffee, but its consumption still rose 1.2% from 2010 to 2.916 billion pounds in the U.S. in 2011. In the past decade, as domestic demand jumped 44% to 100.3 billion cups last year, spending rose even more (up 135%) based on the data compiled by Cedarhurst, a New York-based researcher StudyLogic shows. The said, data supports the notion that the current demand for coffee is considered inelastic.

Given the growing demand for coffee over time, this paper inferred that the upper income classes' coffee expenditure in relation to their total expenditures are higher as compared to that of the poor (lower income class), as shown by the increase in coffee consumption proportionate to being highly commercialized in the market. Consequently, they shall be most affected should taxes be imposed on coffee growers/ producers assuming that the grower/producers shall shift the additional taxes imposed on coffee to the consumers/buyers. Furthermore, demand for coffee may be considered inelastic (Doan, 2014). Additional taxes on it may then generate significant amounts of revenue for the government if taxes are strategically applied to the coffee industry. However, this study did not include an analysis of the deadweight losses associated with this tax imposition and other government intervention factors (aside from tax imposition) that may affect the supply side for coffee nor the other determinants of demand and supply for the coffee industry. Thus, the primary research question is if whether or not tax incidence on coffee shall most likely affect the upper class.

## Methodology

By using the ordinary least squares (OLS) method, linear regression that is, this study aimed to estimate the impact of the aforementioned tax imposition to the different income deciles. The ordinary least squares (OLS) method used this study aimed to estimate the impact of the aforementioned tax imposition to the different income deciles using basic regression. From the first income decile (poorest among the samples) to that of the tenth decile (richest among those sampled), this study was able to investigate the different classes based on the data provided on the different National per Capita Income of each income class. The resulting estimator is expressed by the formula:

$$Ti = \frac{Coffee}{Total\ expenditure} =$$

$$f\ (1decile, 2decile, 3decile, 4decile, 5decil,$$

$$6decile, 7decile, 8decile, 9decile, 10decile)$$

where $T_i$ takes on a value of a function of the different income deciles. Meaning, this study assessed the allocation of each income decile's coffee consumption over the total expenditure. This aided the researcher in understanding as to which social class, the lower income deciles as the lower income class or the higher income deciles as the upper income class, was most affected by the imposition of additional taxes on coffee.

The formula above shows that coffee expenditure over total expenditure is a function of the different income deciles with age of the head of the household and its family size being control variables. Consumption among the different regions in relation to the consumption of coffee in the National Capital Region (NCR) was also considered.

Data and Data Source

The data used in this study was sourced from the 2014 Annual Poverty Index Survey (APIS). The APIS National Demographic and Health Survey (NDHS) aims to present data on the socioeconomic profile of Filipino families and other information that relates to their living conditions. It is designed to provide inputs for the development of poverty indicator and monitoring systems that may be useful for policymakers in analysing, planning, assessing, and evaluating the programs designed for both income and non-income indicators in the Philippines. The sampling frame of the 2014 APIS employed a systematic sampling where each sampling domain (i.e. province/city) is subdivided into segments. These segments consist of about 100 to 400 households, where 81 thousand segments are formed for more than 42 thousand barangays.

The survey included an APIS which collected information such as Background characteristics (i.e. region, age, income, household expenses and family size). To examine the impact of the imposition of tax to transportation, the relevant data taken from the 2014 APIS include: (1) National Per Capita Income; (2) Total expenditures on transportation; (3) Total expenditure per household; (4) Age; (5) Age squared; (6) Region where one is located; and (7) Total income per household. These are presented in Table 2.

Limitations of the Study

Although this study produced significant findings which are consistent with previous studies, there are some limitations. First, data used in this impact evaluation study is

non-experimental/non-random, hence the resulting treatment effect may not be completely free of bias arising from self-selection of the participants Further, in employing OLS, there is still the possibility of not encompassing all variables that may affect the consumption behavior or cost allocation of coffee consumers over their total expenses. Table 1 below shows the variables used from the data set and their corresponding description.

**Table 1**

*Relevant 2014 APIS Data and Description*

| Variables | APIS data | Data description |
|---|---|---|
| Natpc | National Per Capita Income | National Per Capita Income decile |
| Coffee | Coffee (total) | Total expenditure on coffee |
| Totex | Total Expenditure | Actual disbursement/expenditures of the household |
| Age | Age | Age as of his last birthday |
| Age_sq | Age squared | Dummy variable where age is squared |
| Fsize | Family size | Family Size |
| Regn | Region | Region where the respondent resides |
| Toinc | Total income | Total income per household |

**Table 2**

*Summary Statistics of Selected Data from 2014 APIS Households*

| Variables: | Number of observations | Mean | Standard deviation | Minimum value | Maximum Value |
|---|---|---|---|---|---|
| National Per Capita Income | 10,105 | 5.378 | 2.878 | 1 | 10 |
| Coffee expenditure | 9,862* | 1,545.972 | 1,524.083 | 6 | 21,320 |
| Total expenditure | 10,105 | 102,622.1 | 106,444.5 | 4,192 | 3,439,292 |
| Age | 10,105 | 50.412 | 14.2 | 15 | 98 |
| Age squared | 10,105 | 2,742.972 | 1,502.871 | 225 | 9,604 |
| Family size | 9,862* | 4.576 | 2.183 | 1 | 19 |
| Region | 10,105 | 13.087 | 11.868 | 1 | 42 |
| Total income | 10,105 | 122,099 | 145,442.7 | 3,000 | 3,369,258 |

*Note:* 243 respondents did not answer coffee expenditure and family size and were removed.

## Results and Discussion

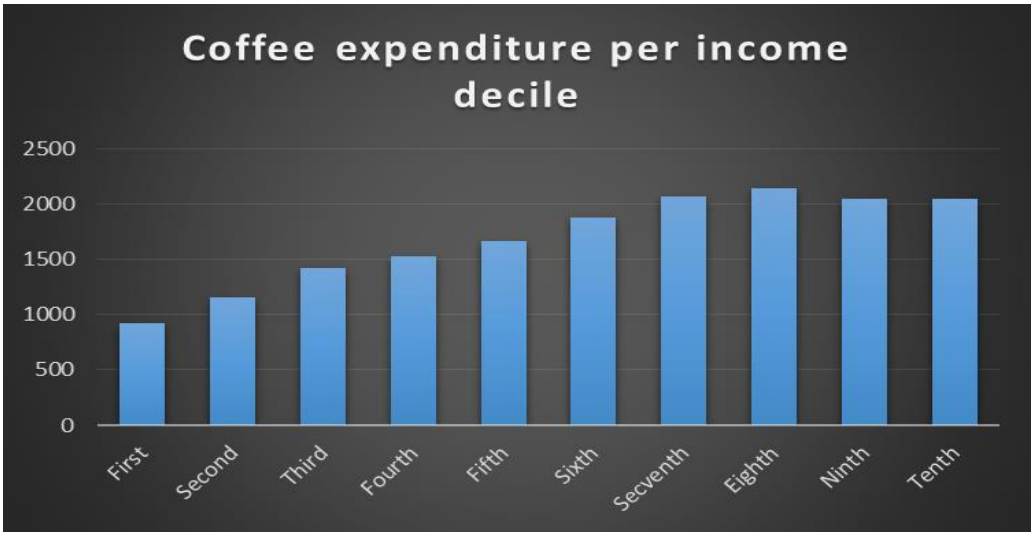
In determining the impact of additional tax on coffee, household spending and consumption on coffee must be determined per income level. Table 3 below shows the tabulated expenditure on coffee of the different income socioeconomic classes: These computations below are derived from the data set from APIS NDHS, while Figure 2 translates the said set of data into a graph.

**Table 3**
*Coffee Expenditure Among the Socioeconomic Classes*

| Income Decile | Coffee Expenditure (mean) |
|---|---|
| First | 949.9842 |
| Second | 1162.656 |
| Third | 1433.931 |
| Fourth | 1551.02 |
| Fifth | 1689.076 |
| Sixth | 1925.237 |
| Seventh | 2108.769 |
| Eighth | 2186.541 |
| Ninth | 2094.448 |
| Tenth | 2104.358 |

When graphed, as shown below, exhibits a positive relationship between coffee expenditures and higher income. Specifically, the graph below shows that the higher the income class, the higher the spending for coffee. This does not come as a surprise since if one has a higher purchasing power and if demand for coffee is the same for all income groups, one would be spending more.

**Figure 2**
*Total Coffee Expenditure over Income Decile/Socioeconomic Status*




The researcher may be tempted to conclude that tax on coffee will automatically be shifted or transferred by the coffee producers to the consumer belonging to the upper income class. However, a closer scrutiny of the data shows otherwise. Based on the data generated by the regression model above, the researcher was able to derive the coefficients of the first nine (9) income groups. These coefficients represent the respective income groups' allocation of their coffee expenditure over their total household expenditure. These coefficients were generated in consideration of the $10^{th}$ income decile as the "dropped" variable.

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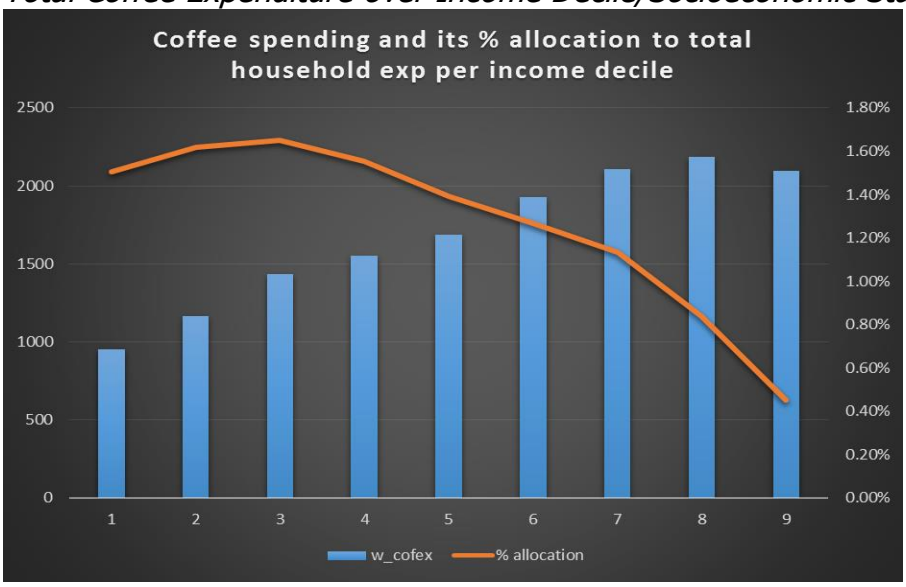
## Table 4

*Relationship of Coffee Allocation to Independent Variables*

| coffeeshare2 | Coef. | Robust Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| pufh05_age | -.0002497 | .0000372 | -6.71 | 0.000 | -.0003226 | -.0001768 |
| age_sq | 2.08e-06 | 3.47e-07 | 6.00 | 0.000 | 1.40e-06 | 2.76e-06 |
| fsize | -.0002982 | .0000375 | -7.96 | 0.000 | -.0003717 | -.0002248 |
| incdecile1 | .0150611 | .0003013 | 49.99 | 0.000 | .0144706 | .0156517 |
| incdecile2 | .0161601 | .0003044 | 53.09 | 0.000 | .0155634 | .0167567 |
| incdecile3 | .0164833 | .0003221 | 51.17 | 0.000 | .0158519 | .0171146 |
| incdecile4 | .0155245 | .0003009 | 51.60 | 0.000 | .0149348 | .0161142 |
| incdecile5 | .0139284 | .0002934 | 47.48 | 0.000 | .0133534 | .0145034 |
| incdecile6 | .0126854 | .0002947 | 43.04 | 0.000 | .0121077 | .0132631 |
| incdecile7 | .0113187 | .0002891 | 39.15 | 0.000 | .0107521 | .0118854 |
| incdecile8 | .0083769 | .000259 | 32.35 | 0.000 | .0078693 | .0088845 |
| incdecile9 | .0045322 | .0002277 | 19.91 | 0.000 | .004086 | .0049785 |
| region1 | -.0091395 | .000352 | -25.97 | 0.000 | -.0098294 | -.0084497 |
| region2 | -.007548 | .0003518 | -21.45 | 0.000 | -.0082375 | -.0068584 |
| region3 | -.0056283 | .0003422 | -16.45 | 0.000 | -.0062989 | -.0049576 |
| region5 | -.0053315 | .0004277 | -12.47 | 0.000 | -.0061697 | -.0044932 |
| region6 | -.0028183 | .0003884 | -7.26 | 0.000 | -.0035796 | -.002057 |
| region7 | -.0055345 | .0004131 | -13.40 | 0.000 | -.0063441 | -.0047249 |
| region8 | -.0035675 | .0004486 | -7.95 | 0.000 | -.0044469 | -.0026882 |
| region9 | -.0023907 | .0005038 | -4.75 | 0.000 | -.0033782 | -.0014032 |
| region10 | .0005551 | .0004778 | 1.16 | 0.245 | -.0003814 | .0014916 |
| region11 | -.0031032 | .0004099 | -7.57 | 0.000 | -.0039066 | -.0022999 |
| region12 | -.0018917 | .000509 | -3.72 | 0.000 | -.0028893 | -.0008941 |
| region13 | -.008644 | .0004269 | -20.25 | 0.000 | -.0094806 | -.0078073 |
| region14 | -.0090488 | .0003433 | -26.36 | 0.000 | -.0097217 | -.008376 |
| region15 | .0004186 | .0005278 | 0.79 | 0.428 | -.0006159 | .001453 |
| region4A | -.0047961 | .0003276 | -14.64 | 0.000 | -.0054382 | -.0041541 |
| region4B | -.0064214 | .0004544 | -14.13 | 0.000 | -.007312 | -.0055309 |
| _cons | .0202419 | .0009632 | 21.01 | 0.000 | .018354 | .0221298 |

**Figure 2**
*Total Coffee Expenditure over Income Decile/Socioeconomic Status*




As expected, the lower classes allocate more of their total spending to coffee expenditures as compared to the upper class. If additional taxes are then imposed on coffee growers, these producers shall consequently shift these taxes to the consumers, thereby transferring the burden of paying the said taxes to the buyers of the commodity. When this happens, it is those who are in the lower income groups of the society who will be greatly affected because of the higher allocation of spending on coffee consumption as compared to those who are in the upper income class.

Aside from the income classes, the government must also consider the regions which may also be affected by this tax imposition on coffee. If one looks at the data presented in Table 4.2, one can see that Regions 10 and 15 allocate most of their spending to coffee expenses though the National Capital Region (NCR) still has one of the highest spending for coffee. This means that spending for coffee comprises a significant portion of their budget, specifically for consumers residing in the said regions. This may be attributed to the fact that since these Mindanao regions have easier access to coffee producers, they may get these coffee products at a cheaper price. But since their income groups in the said area are concentrated on the lower income groups, it still shares much of their total household expenditure. On the contrary, the income groups in NCR or other areas have more concentrations on the upper income classes. NCR would therefore have the highest spending amount for coffee primarily because of these higher income group concentrations and the prevalence of commercialized coffee shops in its region.

## Policy implication

The findings in this study suggest that if the government prioritizes policies that are not anti-poor, it should be taxing neither the coffee producers nor indirectly, the coffee consumers. Rather than tax coffee producers, taxes may just be imposed on other household spending such as clothing and dining out expenses – both of which will have more significant impacts on the upper income classes (8th to 10th income decile) than in the lower class in the society (1st to 2nd income deciles). Conversely, the government may explore imposing a tax system that exempts coffee farmers from output taxes on Value Added Tax (VAT), allowing them to earn tax credits and refunds through input tax (if applicable), without incurring VAT payable through output taxes.

## Conclusion

In examining the impact of additional taxes, this study came across the recurring problem studies such as the non-random program participation. Although this study attempted to mitigate the bias arising from self-selection among the participants, it cannot be ascertained whether or not the resulting estimates are free of bias. This study, however, was able to confirm that incidence of tax shall be borne by the lower socioeconomic classes who allocate more of their expenditures to coffee consumption. It may be worth noting that as an alternative, the government may also consider imposing VAT only on commercialized coffee – thereby focusing on the fact that only consumers of "luxury" coffee (i.e. Starbuck's, Seattle's Best, Figaro, etc.) shall be affected by the additional taxes that shall be imposed with the hopes that it shall have the same revenue-generating effect as that of sin taxes on cigarettes and wines. This prediction is made based on the facts that: (i) coffee spending in NCR is relatively higher as compared to other regions (first graph below) even if (ii) their coffee consumption allocation over their total expenditure is low (second graph below). NCR is pegged as Region 13 (between 10 and 15) on the x-axis of the two graphs below. Through this, the government may still generate significant revenue without compromising its pro-poor stance on government policies.

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**Figure 3**
*Total percentage of spending on clothing over the total expenditure of households*

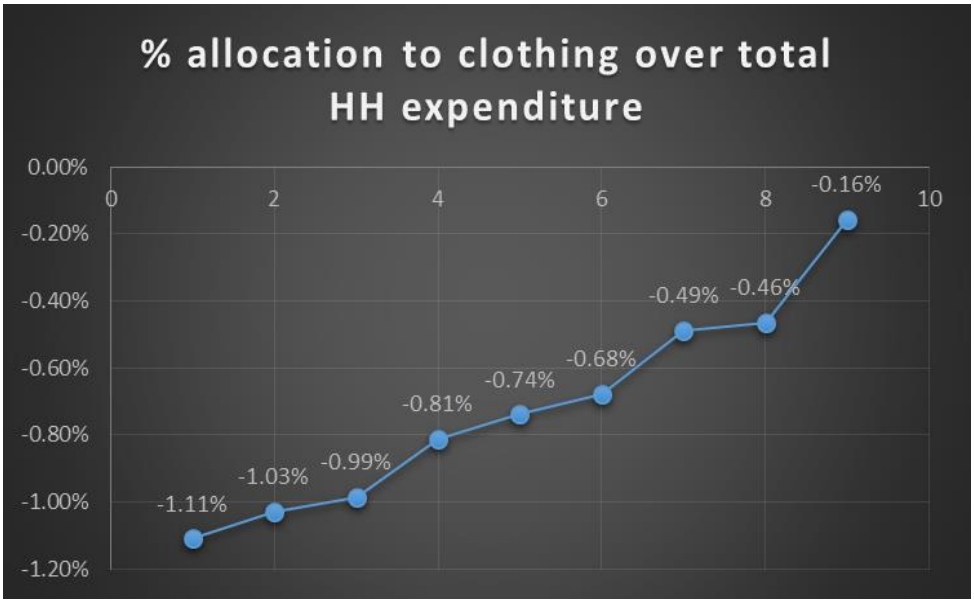
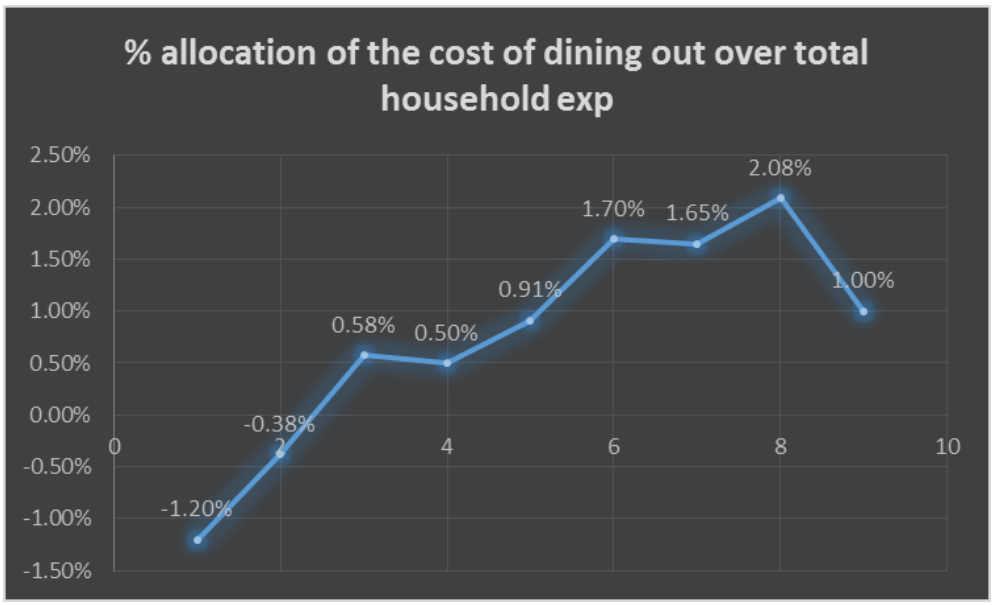



**Figure 4**
*Total percentage of spending on dining out over the total expenditure of households*



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