

Competition characteristics and market share effects in BOP markets.
Evidence from the cookie industry in Ghana

D. Marques Ribeiro, 610633

August 24th, 2024

Abstract

This study looks into the pricing strategies used by businesses in the Base of the Pyramid (BOP), with a particular emphasis on the effects of market share, product size, and manufacturer size. According to the analysis, smaller and domestic companies usually offer smaller packages at lower prices, whereas larger manufacturers set higher pricing and offer greater package sizes. Panel data research shows that prices generally rise with time for most manufacturer sizes, with the exception of local businesses that are forced to lower unit pricing in order to stay competitive. This price adjustment is a result of larger businesses using their branding to strategically command higher pricing, while smaller businesses use price reductions to draw in customers in the face of intense competition. Smaller businesses are therefore under financial hardship, which could cause them to leave the market. The study also shows that smaller businesses prioritize expansion and reputation building, whereas larger businesses strive for profit maximization. The study's concentration on a single market inside a single nation and the dataset's imbalance of small and medium-sized businesses making up the majority of the data, are among its limitations. By looking at different marketplaces and using data from developed economies as counterfactuals, future study could improve conclusions.

1. Introduction

Franklin D. Roosevelt was the first person to talk about a pyramid scheme in an economic context, introducing the “Bottom of the pyramid” (from now on BOP) concept that we know today. He said in an interview that “These unhappy times call for the building of plans that rest upon the forgotten, the unorganized but the indispensable units of economic power, for plans like those of 1917 that build from the bottom up and not from the top down, that put their faith once more in the forgotten man at the bottom of the economic pyramid” (Roosevelt, 1932). Today, the BOP sector is highly researched, and many firms have set foot in this market contrarily to two decades ago when the BOP markets were untouched upon. The topic of BOP markets is especially interesting as it can be tackled from different points of view. Some might argue that the BOP market is a profitable opportunity for business and others might argue it to be a place in need of drastic change with the goal of funding poverty alleviation. Prahalad was the first researcher to dip into the unexplored depths of this economic environment. He classified the BOP as being a population of more than 4 billion people living on less than USD 2 per day (Prahalad, 2005; 2012). Following Prahalad’s research, many others have tapped into discovering BOP markets from many different approach angles. Research ranges from poverty alleviation and resource dependency to profitability of firms. Poverty alleviation is a recurring topic in this research area as BOP markets are defined serving the poorest and most financially unstable people in the world. Although their individual purchasing power might be minimal, the collective BOP market potential is vast, encompassing billions of people primarily in developing countries. In Africa alone, the buying power index (BPI) is 76.9% which means that 76.9% of the purchasing power comes from the BOP segment in contrast to 23.1% from the mid and high income segments (Guesalaga & Marshall, 2008). The opportunity to acquire these available monetary resources, has lead firms to enter the BOP sector and to compete against other firms for a larger share of the market. Competition was first based on innovation and which firm could find the dominant design which would allow a firm to gain the advantage over their competitors (Suárez & Utterback, 1995). In their paper, Suárez and Utterback argue that firms that enter a market prior to that dominant design have a higher chance of survival than firms that enter after the innovation is introduced. Thus, the firms that managed to set foot and survive that period compete based on different factors other than design. These factors can range from pricing strategies all the way to market share and sales volume.

This research has high scientific relevance as there are not many papers that address this specific question of manufacturer size linked to product characteristics and pricing strategy. Pitta et al. (2008) suggest that the businesses wanting to make money at the BOP will have to ‘reinvent’ themselves. This shows how new the BOP market is for companies and how tapping into the BOP market can prove to be a good or a bad marketing and economic move in future years. Additionally, Antonecchia &

Bhaskarabhatla (2023) address how firms might compete in a uniform pricing scenario. In this paper, they lay out different strategies such as packaging size or even product variety. These papers among others will help shape this thesis and lay a foundation for my research. My thesis will try and address a problem not already answered before and therefore hopefully enrich the literature already existing.

The social relevance of BOP market research goes beyond profit maximization and product differentiation. The BOP market has found to be more than just an untapped market, it's also considered a sea of opportunities for new firms. Prahalad (2012) in his paper about the BOP market being a source of breakthrough innovations, argues that firms can create a friendly environment for innovation. He also focuses on the external constraints and suggests firm could build an innovation sandbox around those constraints to create new products and become more acquainted to the BOP market environment. Another aspect of social relevance is poverty and poverty alleviation in the BOP sector. Many researchers have tapped into the topic of poverty and firms entering BOP markets. Karnani (2017) suggests that private firms can help alleviate poverty by entering the BOP market and creating jobs for the poor. This might imply changing profitability schemes and potential performance loss. Furthermore, he argues that the government could help firms set business up easier and through that help create more jobs and reduce poverty. Although, this topic goes beyond the scope of this research it is a good aspect to keep in mind when thinking of pricing strategy in the BOP environment.

The following research will try to answer the following central research question:

How do manufacturer and product characteristics affect pricing strategy and market share in BOP countries?

This question will be answered with the help of different hypotheses testing and a large data set used for it.

The remaining structure of the paper is as follows. Chapter 2 will consist of a literature review where the hypotheses will be laid out and explained with the help of the existing literature. This extensive literature section will help assess which aspects of this market have been more researched than others. Next, chapter 3 will be a data section where the data set is explained for the reader to better understand the variables used and the tests done to it. Chapter 3 will be the methodology part, where the test that have been done are explained. This section will explain why the chosen methods have been used with this specific dataset and how the results will be the most reliable with those methods. Following, chapter 4 will be the results section where the actual research results will be displayed. Primarily this section has the goal of laying out the raw findings and explaining the simple numeric findings. Finally, chapter 5 will consist of the discussion and the conclusion where the found results will actually be discussed and compared to the findings in the pre-existing literature. A small conclusion will round up the final

part of the research where the implication of the findings and the limitations of the research will swiftly be discussed.

2. Literature Review

In the following section, which will be divided into different topics of interest, we will discuss the existing literature and try to lay a foundation for this research. With the help of the analysed papers, we will try and motivate the hypotheses which will be refuted or supported in a later results section.

The literature in the field of BOP markets is vast but not conclusive on many aspects.

2.1. The Bottom of the Pyramid

Research on consumer behavior at the Base of the Pyramid (BOP) has increasingly highlighted the nuanced and sophisticated consumption patterns exhibited by this demographic. Despite facing significant income and resource constraints, BOP consumers demonstrate remarkable creativity and a drive to fulfill not only their basic survival and physiological needs but also their higher-order aspirations. These aspirations often encompass social capital, cultural identity, and compensatory mechanisms for deficiencies in other areas of life, such as education, healthcare, and social status (Subrahmanyam & Tomas, 2008).

The traditional view of BOP consumers as primarily focused on subsistence has been challenged by emerging evidence that underscores the complexity and depth of their consumption behaviors. These consumers do not merely seek to survive; they strive for a better quality of life, pursuing products and services that enhance their social standing, reflect their cultural values, and provide a sense of dignity and empowerment. This has profound implications for businesses and policymakers alike, as it calls for a more holistic understanding of the BOP market.

Recognizing the multifaceted motivations of BOP consumers is crucial for businesses aiming to succeed in these markets. Innovations in product design, pricing strategies, and culturally resonant marketing approaches have shown varying degrees of success in addressing the diverse needs of BOP consumers. For instance, product innovations that consider the unique constraints and preferences of BOP consumers—such as affordability, durability, and multifunctionality—are more likely to be embraced by this market segment. Similarly, creative pricing strategies, including micro-payments, pay-per-use models, and bundled offerings, can make products and services more accessible to those with irregular and unpredictable incomes.

Moreover, marketing strategies that resonate with the cultural and social realities of BOP consumers can significantly enhance product acceptance and brand loyalty. This might involve leveraging local symbols, languages, and narratives that align with the consumers' cultural context. As Suárez &

Utterback (1995) argue, the success of firms in BOP markets is contingent upon their ability to navigate the intricate dynamics of these markets, which are shaped by a myriad of socio-economic factors.

In recent years, scholars have developed various models and frameworks to better understand the BOP environment. These models emphasize the importance of a deep understanding of both individual markets and the broader socio-economic context in which BOP consumers operate. They suggest that businesses must go beyond a one-size-fits-all approach and tailor their strategies to the specific needs and aspirations of BOP consumers. Given the insights from the aforementioned literature and the data at our disposal, this paper aims to explore and test the following hypothesis:

H1: In BOP countries manufacturers offer smaller sized packages at lower prices compared to larger sized packages.

These models are helpful in figuring out which market strategy to use and which consumers to target. Nevertheless, these models are not all useful in any scenario as some are believed to be outdated and not extrapolatable across continents (Kolk et al., 2014).

2.2. Poverty alleviation

Poverty alleviation has been discussed and researched in the past decades with the increase of demand for such strategic interventions in developing countries. Poverty alleviation is closely linked to policies and especially trade policies. Scholars have put many resources into finding the right strategy to apply to economies where the goal is to reduce poverty. Labor intensive jobs are believed to be a reliable source of poverty alleviation as it increases workers income and simultaneously their purchasing power (Loayza & Raddatz, 2010). Another primary factor for poverty alleviation in developing countries is international trade. Countries with international trade have much more potential in reaching poverty alleviation than countries without such trade laws. Different studies suggest a trade reform where international trade is liberalized to be positive even in the short term where profits outweigh costs (Bannister, 2001). In his paper Bannister also argues that in the short-term benefits are underestimated and costs are overestimated, leading to believe that in the medium-term the benefits from trade liberalization can be drastic for poverty alleviation. He also points out that with such reforms come great changes and that these reforms need to be done while assisting the poorest to adapt to the change. Adversely, there are scholars that argue in favour of poverty alleviation from a different point of view than that of MNC's. When trying to eradicate poverty or simply reduce it, companies must market to the poor in a way that is economically reasonable for both parties meaning prices should not be too high

neither should they be too low for the company to make a loss. This leads to a reshape in pricing strategy and product quality for companies trying to market in the BOP. Private companies are required to reduce their price drastically to reach that sought poverty alleviation (Karnani, 2005). Karnani criticises Prahalad's idea on how to eradicate poverty as quick as a 15-year time span, and suggests that "the real fortune at the bottom of the pyramid" is found when companies are able to render the poor more productive and skilled in order to create employment opportunities for them. For this, market access and labour market access are crucial for the longevity of poverty alleviating changes. Hence, policy changes in developing countries cannot be deployed like aggressive public fund policies in more developed countries. This is why the private and public sector are expected to work together to obtain the desired outcome of poverty alleviation. Only the private sector can create jobs for the poor, where the government can help facilitate that. Only the state can provide basic public services and together both could have a positive impact on the job creation and poverty alleviation in BOP countries (Karnani, 2017).

The strategies of poverty alleviation in developing countries put more emphasis on the private sector and the businesses to obtain the needed resources to support such policy implementations (Cooney & Shanks, 2010). Fast moving consumer goods are believed to be inaccessible financially for most poor people (Warnholz, 2012). In his paper about poverty alleviation Warnholz argues that firms wanting to enter the BOP market should focus primarily on necessity goods in order to meet real existing demand from the poor. Another method brought forward is to create jobs and incomes in order to stimulate consumption by the poor. Consequently the business and governmental collaboration is one of the important pillars for a successful poverty alleviation alternative to usual policies (Ansari et al., 2012). For this firms will have to rethink the way of making business and most of all how they market themselves to the poor.

2.3. Competition

Another pillar of the existing literature on BOP markets is competition and how it is intricately shaped by innovation and strategy. The available research offers multiple perspectives on competition in BOP markets, highlighting how the evolving landscape at the BOP is likely to influence the broader competitive dynamics in the global business environment. Firms that operate in these challenging markets are often forced into organizational and managerial shifts to establish a foothold. In the BOP context, it is not necessarily the largest or most resource-rich companies that succeed, but rather the most innovative ones that gain traction in such hostile conditions (Prahalad, 2012).

Multinational corporations like Nestlé, Unilever, and Nokia have historically leveraged their innovations from more developed markets to gain an edge in BOP markets. However, success in these environments requires more than just transferring existing models; it demands tailored innovations and adaptive strategies that resonate with the unique needs of BOP consumers. According to Prahalad

(2012), the next decade will see the BOP market setting the pace for global competition, with firms that can navigate these complexities poised to lead in the broader marketplace.

With this, we will try to answer the second hypothesis:

H2: Manufacturers selling at lower prices have higher amount of sales compared to manufacturers selling at higher prices.

In the BOP, competition can be segregated into different areas in which companies fight to gain the upper hand over their competitor. Availability, affordability, acceptability and awareness, also known as the 4 A's, are believed to be the vital competition areas in the BOP (Anderson & Billou, 2007). The availability of products in such harsh economic environments is hard to ensure especially with traditional logistics and methods. Therefore, companies must find new ways of supplying their product to the poor or start producing locally, which can become a costly decision. Next, affordability is the key point to a business's success in the BOP as marketing to the poor is closely linked to price reduction and making prices the sales argument for the sold product. The solution to making products affordable is to reduce their size and offer micro-packs at affordable prices for the poor. Acceptability means adapting the product and services to a customer's needs and promoting the satisfaction of needs of both consumers and producers. The last A on Anderson and Bilou's paper stands for awareness, as gaining awareness in the BOP is no easy task with the limited media available to the poor. In India only 41 per cent of less advantaged rural households have access to television (Anderson & Billou, 2007).

Supporting these points, Antonecchia & Bhaskarabhatla (2023) provide evidence that competition in BOP markets extends beyond price, incorporating factors such as pack size, availability, and product variety. Their findings suggest that while price remains important, the optimal combination of product size and variety can give producers a competitive edge. However, they also caution that uniform pricing strategies might not always yield positive outcomes, potentially leading to a loss in consumer welfare if diverse needs are not adequately addressed (Antonecchia & Bhaskarabhatla, 2023).

Overall, firms need to adjust their competition strategy in order to gain the overhand over their competitions. How they do so is determined by the environment they are competing in and how they want to market themselves.

2.4. Strategy

A crucial aspect for firms aiming to succeed in the Base of the Pyramid (BOP) market is the development of a robust strategy. The challenge lies in how these companies position themselves to meet the needs of low-income consumers while maintaining sustainable profit margins. This is a major

consideration that firms must carefully navigate. The environment at the BOP can be particularly challenging for large firms, not only due to the economic constraints of the consumers but also because traditional business methods that work in developed markets often fall short in these settings (Pitta et al., 2008).

According to Pitta (2008), the actual wealth available to BOP consumers is often lower than initially estimated, complicating efforts for firms to accurately understand and cater to the needs and perceptions of this demographic. To establish a successful business model in the BOP market, firms must be willing to innovate not only in their product offerings but also in their overall business approach and marketing strategies. The processes and strategies that have proven effective at the top of the pyramid (TOP) are not automatically transferable to the BOP context. In this market, the failure of just one element—whether in production, distribution, or management—can necessitate a comprehensive reevaluation of the entire business model. As Pitta (2008) argues, companies that are not prepared to undergo significant changes in their methods and operations should reconsider their decision to enter the BOP market. Furthermore, firms must approach entry into the BOP economy with the understanding that profitability is unlikely to materialize in the short or even medium term. This requires a long-term investment perspective, where the initial focus is on building market presence, trust, and relationships, rather than immediate financial returns (Pitta et al., 2008).

Finally, the final hypothesis that will be tested is the following:

H3: Manufacturers of larger size, offer small sized packages at higher prices compared to manufacturers of smaller size.

In 2008, Guesalaga and Marshall pointed out that the measurement of purchasing power at the BOP level is often inadequate, failing to provide firms with a reliable indication of the actual funds available to consumers for discretionary spending. This misalignment between consumer needs and corporate pricing strategies can lead to ineffective market approaches and missed opportunities (Guesalaga & Marshall, 2008). To address this, the use of the Buying Power Index (BPI) has been suggested as a more accurate tool for assessing purchasing power at the BOP. BPI offers insights not only into the financial capabilities of consumers but also into the geographical, social, and economic contexts that shape their spending behaviors.

In many developing regions, including Africa, more than 50 percent of purchasing power resides within the BOP segment. This group primarily allocates its limited resources to essential expenditures such as food, housing, and household goods. The challenge for firms operating in this environment is profound; they must shift their strategic focus from profit maximization to prioritizing customer satisfaction. This requires a fundamental rethinking of product offerings and an emphasis on creating demand through accessible pricing strategies (Mathur et al., 2016).

Successful companies have demonstrated that a combination of innovative capabilities and cost efficiencies can drive demand, even at lower price points. Firms must not only rethink their product strategies but also optimize their processes to achieve greater efficiency and cost-effectiveness in light of the necessary price reductions. Additionally, the BOP market is not monolithic; it can be segmented into low-, middle-, and high-income tiers, each with distinct consumption habits and needs. According to Mathur (2016), these segments require tailored approaches, and companies should carefully consider which segment to target initially before expanding into lower-income brackets.

Taking a different perspective, Singh et al. (2022) argue for a market creation approach aimed at helping the poor maintain social status and inclusion. They suggest that firms can generate additional revenue by highlighting the "social attributes" of products, as BOP consumers are often influenced by their peers. By educating consumers about the social benefits of certain products, companies can transform consumption into a form of empowerment and social capital (Singh et al., 2022). The significant heterogeneity within the BOP market, compounded by varying levels of education and cognitive and behavioral capabilities, underscores the necessity for firms to adapt, even if they have been successful in TOP markets. Companies that can innovate and adjust to the unique challenges of the BOP market stand to gain significantly from these efforts.

In conclusion, the existing literature provides deep insights into the evolution of the BOP over the past two decades, revealing how perspectives on this market have shifted. Building on these studies, this research aims to further expand the body of knowledge and establish a foundation for future inquiries. In the following section, we will discuss the data used for this research, which will be instrumental in addressing the final and main research question:

How does manufacturer size, product characteristics and market share affect pricing strategy in BOP countries?

The next section will summarize the data used and explain some of the variables used later in the econometric models.

3. Data

The data used is Nielsen data and comprises 9231 (8224 after modelling) observations of cookie manufacturers selling in Ghana from June 1st 2017 all the way through to June 1st 2020. The raw data set consists of simple data such as manufacturer name, firm name, pack size, sales and production volumes as well as an indicator of the available stock. Further data has been generated such as average price of product, the size of the manufacturer, "DOM" for domestic firms, "SME" for small and medium enterprises and "EMNE" and "MNE" for (emerging) multinationals. Additionally, as the data consist of panel data of a three-year time span, there is also a variable indicating the date of every observation.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
unitsin1000	8224	90.006	214.091	.1	3717.2
volumein1000kgs	8224	3.712	6.52	0	53.4
valuein1000ghc	8224	58.574	87.631	.1	499.6
purchasesvolume~1000	8224	3.742	6.603	-.3	54.3
valueros	8224	21.509	19.252	0	99.5
avgpriceghc	8224	2.831	3.783	.014	26.923
ManufacturerSize	8224	2.663	.645	1	4
MRKTShareVAL	8224	.071	.114	0	.429
MRKTShareVOL	8224	.078	.134	0	.494
nPackSize	8224	108.737	108.725	8	600
Size small	8224	.352	.478	0	1
Size medium	8224	.317	.465	0	1
Size large	8224	.331	.471	0	1
Q1	8224	.256	.437	0	1
Q2	8224	.274	.446	0	1
Q3	8224	.232	.422	0	1
Q4	8224	.238	.426	0	1

Notes: The table shows descriptive statistics for each variable used in the regressions later in the results section. The leftmost column shows the variable name. The remainder of the table displays simple descriptive statistics such as the mean, standard deviation as well as the minimum and maximum values of each variable. The variables will be explained in the paragraph below.

For simplicity reasons the following section will explain the names of the variables and list all the used variables in the table above.

The first variable “unitsin1000” holds the units sold by manufacturer in 1000’s. Similarly, “volumein1000kgs”, “valuein1000ghc” and “purchasevolumein1000” stand for volume in 1000 kilograms, value of products sold in 1000 Ghanaian cedi and the number of products purchased in 1000 units respectively. “Valueros” describes the value of the rate of sales. “Averagepriceghc” is the indicator of the average product unit price in Ghanaian cedi. The variable “ManufacturerSize” is a variable taking the values of 1 through 4 indicating the economic size of the manufacturer. “MRKTShareVAL” and “MRKTShareVOL” display the market share of each manufacturer based on sales value and sales volume respectively. Next, the variable “nPackSize” is a numerical variable carrying the size of the products in grams. Additionally, the variables “Size small”, “Size medium” and “Size large” indicate the size of the packages sold with small packages being products under 45 grams, and large packages being weights above 100 grams. Finally, the last variables indicate the quarter in which the observation has been recorded.

The next section will explain what tests and methods have been used with the data in order to obtain the results later displayed in the “Results” section.

4. Methodology

First, it is important to remember what the main research goal is. The goal is to answer the following research question: “How does manufacturer size, product characteristics and market share affect pricing strategy in BOP countries?”.

With the help of statistical tests and econometric models, we will be able to approximate the right answer to this main research question by answering the above-mentioned hypotheses. First, we simply collected data from a data base and downloaded it to “Stata” the statistical software for easy manipulation of the data. The original data set consist of 13 variables with 9231 observations, after variable creation and after deleting blanks and unfeasible observations, such as negative sales, we remain with 38 variables and 8239 observations. Next, we will produce a table with descriptive statistics (see Table 1) where all the necessary information about the variables in the data will be laid out, such as the mean the standard deviations but also the minimum and maximum value. Subsequently, we will produce three tables each displaying results from three regressions each. Every regression differs from the previous due to added variables to make the results more reliable (see Table 2-4). Finally, there will be three final regressions with time constraints comprising all the variables used previously. This will help identify if there are drastic changes between time brackets in order to identify biases.

In the following section we will lay out all the results gathered from the data by means of statistical tests. The results will be dissected into different sub sections to give a simpler overview of the findings.

5. Results

5.1.General

As a first part of the results section, we will illustrate the general regressions done with the data with the aim to approach an answer to the hypotheses. Later, we will try to approach the hypotheses with panel data estimators and different statistical regressions.

Table 2: Effect of package-size on product price in Ghanaian cedis

Variables	(1)	(2)	(3)	(4)
	Unitprice	Unitprice	Unitprice	Unitprice
nPackSize	.029*** (0.000)	.029*** (0.000)	.027*** (0.000)	.020*** (0.002)
MNE		.410*** (0.157)	.240 (0.157)	.814*** (0.173)
EMNE		-.023 (0.123)	.244* (0.132)	.262** (0.120)
SME		.254** (0.116)	.253** (0.114)	.087 (0.071)
Unitsin1000			.000** (0.000)	-.000*** (0.000)
Valueros			.001 (0.001)	-.000 (0.000)
MRKTShareVAL			29.601*** (1.441)	-5.674*** (0.703)
MRKTShareVOL			-27.012*** (1.224)	4.301*** (0.555)
mSizeXpSize				-.008*** (0.003)
mSizexprice				.365*** (0.067)
Constant	-.364*** (.035)	-.564*** (0.120)	-.431*** (0.121)	-0.010 (0.067)
Observations	8,228	8,228	8,228	8,228
R-squared	0.713	0.715	0.735	0.978

Note: Table 2 displays the regression results where the dependent variable equals the unit price per cookie package in (Ghanaian Cedis) while the independent variables are displayed along the Y axis. *** $p < .01$, ** $p < .05$, * $p < .1$, and the numbers in brackets represent the standard deviation. Below, we find the number of observations as well as the R-squared for each regression.

In table 2, the following regression (1) was carried out to determine if pack size affects the unit price of a cookie package in Ghana to answer the first hypothesis:

$$\text{Unitprice} = \text{Constant} + \text{nPackSize} * \beta_1 \text{ (1)}$$

As can be deduced from column (1), we find that pack size has a minimal positive but significant effect on unit price therefore explaining price variation between package sizes. We can also notice the negative

but significant value of the constant, unit price, which cannot be interpreted as unit price cannot be negative.

Column (2) offers a better insight into how different sized manufacturers affect the final unit price as these variables are added to the regression. As we can see the coefficient of pack size does not differ from the one in column one which leads to believe that the added variables, meaning manufacturer size, are correlated with the pack size variable. As shown, the MNE coefficient is significant and positive, indicating a price increase in unit price for multinational firms all else equal. For SME's the coefficient is also positive and significant but only at the 95% level and the coefficient is almost half of the MNE coefficient already indicating a discrepancy in pricing. For EMNE's, the coefficient is negative but not significant and therefore not interpretable. The constant is still negative and significant but can also not be interpreted as negative price is not feasible.

In regression (3), we add different variables of measure, such as units sold, the rate of sale and the market shares by value and volume respectively. Here we find, that the "nPacksizes" variable did not change sign or significance remaining significant at the 99% level. Next, the MNE variable is no longer significant and has significantly decrease. Conversely, EMNE has become significant at the 90% level and positive compared to column (2). The SME variable has remained the same as before. The new variables, such as units sold in 1000 is significant, with the coefficient being zero and not interpretable. Similar, the rate of sale variable is zero and not significant. For the market share coefficients, there is a noticeable difference between volume and value. The market share coefficient wrt. value, is significant and positive while the volume coefficient is negative and significant. Important to state that the two values are almost similar with different signs. The constant remains significant but negative.

In column (4), we add different interaction effects which allow us to produce a regression with a high R-squared. This value of 97.8%, indicated the percentage of variability explained by the model indicating a good model for the used data. Similar as before, pack size has not changed sign nor significance. Noteworthy is the coefficient of MNE which has become positive and significant with a coefficient three times larger than that of the second biggest manufacturer coefficient, EMNE. The SME coefficient has become very small and insignificant. As before, rate of sales and units sold in 1000 has no effect on the constant at all. When adding interaction effects to the regression, the coefficient of market share decreases drastically for the value variable and increases drastically for the volume variable. Moreover, the signs have inverted, now, the value variable is negative and significant while the volume variable is significant and positive. Furthermore, the interaction effects are both significant at the 99% level with manufacturer size x product size having a small negative coefficient and manufacturer size x price having a positive coefficient of .365. The constant remains negative but is no longer significant, being either way not interpretable.

Table 3: Effect of unit price on units sold

Variables	(1)	(2)	(3)	(4)
	Unitsin1000	Unitsin1000	Unitsin1000	Unitsin1000
Unitprice	-13.712*** (0.441)	-13.060*** (0.421)	.940** (0.467)	-5.849*** (1.067)
MNE		-51.123*** (3.242)	-20.308*** (2.744)	-28.661*** (5.582)
EMNE		40.273*** (7.451)	-23.666*** (4.891)	-27.597*** (5.760)
DOM		-83.508*** (3.862)	-72.545*** (5.004)	-68.504*** (4.827)
nPackSize			-.348*** (0.021)	-.081* (0.045)
Valueros			1.286*** (0.122)	1.282*** (0.122)
MRKTShareVAL			-1255.398*** (113.254)	-1275.939*** (113.940)
MRKTShareVOL			1506.97*** (100.775)	1524.119*** (102.265)
mSizeXpSize				-.110*** (0.019)
mSizexprice				2.810*** (0.435)
Constant	128.778*** (3.409)	124.814*** (3.578)	77.218*** (3.420)	79.470*** (3.659)
Observations	8,228	8,228	8,228	8,228
R-squared	0.059	0.072	0.159	0.159

Note: Table 3 displays the regression results where the dependent variable equals the units sold in 1000 while the independent variables are displayed along the Y axis. *** $p < .01$, ** $p < .05$, * $p < .1$, and the numbers in brackets represent the standard deviation. Below, we find the number of observations as well as the R-squared for each regression.

To answer the second hypothesis, table 3 consists of the following regression (1) that was carried out to determine if unit price affects the number of units sold.

$$\text{Unitsin1000} = \text{Constant} + \text{Unitprice} * \beta_1 \text{ (1)}$$

As deductible from the first column (1), unit price has a negative and significant effect on units sold with a coefficient of -13.712 and a standard deviation of 0.441. The constant is positive and significant with a value of 128.778. This first simple regression is meant to show the correlation, and it's sign between the independent and independent variable. This first regression and all three others obtain a r-squared value of maximum 0.159 which will later be discussed in the limitations section.

Next, we added the different manufacturer magnitudes to see the effect it has on units sold. We notice that multinationals have a negative but significant coefficient at the 99% level. Next, EMNE has a positive and significant coefficient compared to SME which has a negative and significant coefficient. The constant remains positive and significant at the 99% level.

In column (3), we add the rate of sales, pack size and market share variables in order to increase the reliability of the model. First, the sign of “unitprice” has changed and become positive and significant at the 95% level. Next, all manufacturer coefficient are now negative and significant. We notice that package size has a negative but significant effect on units sold. Conversely the rate of sale has a positive and significant effect on units sold. Last but not least, the market share variables, like before, have opposite signs as the value variables is negative and significant and the volume variable is positive and significant. The constant remains positive and significant at the 99% level.

In the last column (4), the coefficients mostly remain constant compared to the previous regression, as can be deduced from the r-squared, which remains the same between the two columns. The unit price coefficient changed from being positive to negative but significant at the 99% level. The manufacturer coefficients have remained negative and significant as previously found. The pack size coefficient has remained negative and significant at the 90% level now. Similar, the rate of sales variables has not changed and remained positive and significant. The market share effects also remain the same from column (3) to column (4). The added interaction effects have opposite signs but are both significant at the 99% level. Manufacturer size x package size has a negative coefficient while manufacturer size x price has a positive coefficient. The constant has remained positive and significant.

Table 4: Effect of product size on unit price between different manufacturer sizes

Variables	(1)	(2)	(3)
	Unitprice	Unitprice	Unitprice
Size_small	-.920*** (0.030)	-.916*** (0.031)	-.107*** (0.016)
Size_large	5.327*** (0.085)	5.303*** (0.085)	.665*** (0.032)
MNE		.502*** (0.118)	1.654*** (0.088)
DOM		-.755*** (0.138)	-1.582*** (0.094)
SME			-.821*** (0.025)
MRKTShareVAL			-10.316*** (0.519)
MRKTShareVOL			7.976*** (0.443)
mSizeXpSize			-.001*** (0.000)
mSizexprice			.356*** (0.002)
Constant	1.389*** (0.025)	1.069*** (0.051)	.877*** (0.028)
Observations	8,228	8,228	8,228
R-squared	0.533	0.536	0.962

Note: Table 4 displays the regression results where the dependent variable equals the unit price while the independent variables are displayed along the Y axis. *** $p < .01$, ** $p < .05$, * $p < .1$, and the numbers in brackets represent the standard deviation. Below, we find the number of observations as well as the R-squared for each regression.

To answer the last and third hypothesis, the following regression (1) was carried out to determine if and how different product sizes among different sized manufacturers affect the unit price of a cookie package in Ghana.

$$\text{Unitprice} = \text{Constant} + \text{Size_small} * \beta_1 + \text{Size_large} * \beta_2 \quad (1)$$

With this final regression we try to approximate the answer to the research question as rightfully as possible. We find in the first column (1), that to our expectation, smaller sized packages are sold at smaller prices than larger pack sizes. The coefficient of small sized packages is negative but significant, compared to the large sized package coefficient which is largely positive and significant at the 99% level. The unit price constant is also positive and significant at the 99% level. Important to notice that

the r-squared of the first regression is 0.533 which is not the ideal value for a reliable model. The second column (2) shows that indeed bigger manufacturers sell products at higher prices with MNE having the largest coefficient of .502 which is also significant, compared to the DOM coefficient which is negative .755 and significant. The package size coefficient remain similar to the first column as does the constant and the r-squared. The most interesting column is the last column (3), which when adding in the interaction effect, generates a r-squared of .962 which indicates a good explanation of the variation by the variables. The signs of the variables remain mainly the same the coefficients on the other hand are affected by the introduction of the interaction effects. The magnitude of product size coefficient decreases, while the manufacture coefficients increase all while staying significant. Interesting to note is the interaction effect between manufacturer size and package size does not have a great impact on price with a coefficient of .001. Noteworthy, is the second interaction effect which consists of the manufacturer size and product price, even though being significant, cannot be interpreted as it comprises the dependent variable.

Graph 2 in the appendix shows that unit price is increasing with the package size, further underlining the findings that smaller packages are sold at lower prices compared to larger packages.

Furthermore, graphs 3 and 4 show the unit price and pack size relation for multinationals and small and medium firms respectively. Similarly to what was found in the regression, multinational firms sell their small packages at higher prices than small and medium firms.

5.2. Panel data

In the following section we will illustrate the results from the panel regression with T being the period indicator which ranges from T1 (June 2017) and T36 (June 2020).

Table 5: Effect of manufacturer size on unit price using random effects in different time periods

Variables	(1)	(2)	(3)
	Unitprice	Unitprice	Unitprice
	T1-T12	T13-T25	T26-T33
Size_small	-.076 (0.083)	-.018 (0.095)	-.110 (0.116)
Size_large	.592*** (0.097)	.547*** (0.113)	.790*** (0.151)
MNE	2.359*** (0.344)	3.075*** (0.242)	4.544*** (0.399)
EMNE	.905*** (0.338)	2.114*** (0.228)	2.113*** (0.383)
SME	-.044 (0.328)	.933*** (0.209)	1.280*** (0.364)
Unitsin1000	.000 (0.000)	.000 (0.000)	.000 (0.000)
valeros	.000 (0.000)	.000 (0.000)	.000 (0.000)
MRKTShareVAL	-7.799*** (1.887)	-6.866*** (2.299)	-12.278*** (2.954)
MRKTShareVOL	5.775*** (1.634)	4.407** (2.009)	9.696*** (2.564)
mSizeXpSize	-.001*** (0.000)	-.001*** (0.000)	-.001** (0.000)
mSizexprice	.344*** (0.001)	.343*** (0.001)	.339*** (0.003)
Constant	.027 (0.334)	-.948*** (0.219)	-1.292*** (0.375)
Observations	2380	2580	2178
R-squared	0.972	0.967	0.955

Note: Table 5 displays the panel regression results where the dependent variable equals the unit price while the independent variables are displayed along the Y axis. Column (1) displays the results for period T1 to T12 included, column (2) displays results from period T13 to period T25 included. *** $p < .01$, ** $p < .05$, * $p < .1$, and the numbers in brackets represent the standard deviation. Below, we find the number of observations as well as the R-squared for each regression.

For the above shown regressions, we used the following model:

$$\begin{aligned} \text{Unitprice}_{t1-t12} = & \text{Constant} + \text{Size}_{\text{small}} * \beta_1 + \text{Size}_{\text{large}} * \beta_2 + \text{MNE} * \beta_3 + \text{EMNE} * \beta_4 + \text{SME} \\ & * \beta_5 + \text{Unitsin1000} * \beta_6 + \text{valueros} * \beta_7 + \text{MRKTShareVAL} * \beta_8 \\ & + \text{MRKTShareVOL} * \beta_9 + \text{mSizeXpSize} * \beta_{10} + \text{mSizexprice} * \beta_{11} \end{aligned}$$

In the first column, the time constraint captures the effects between period 1 and period 12 which allows to later compare between time periods. The first column (1) shows as previously stated that smaller sized packages are sold at much lower price than larger sized packages. Similarly, multinationals sell their products at the highest price compared to smaller sized competitors. Units sold and rate of sales does not seem to have any impact on unit price across all time brackets. Market share by value has a negative and significant impact on price and market share by volume has a positive and significant effect on unit price. The interaction effect of manufacturer size and package size seems to have a negligible but significant effect on unit price with a coefficient of -.001 across all time periods. The interaction effect of manufacturer size and unit price is positive and significant across all time brackets. The constant seems to have a great change between the first bracket and the second as the coefficient goes from positive and insignificant to negative and significant at the 99% level. Noteworthy is also the sign and magnitude of the package size coefficient. The small size packages get more expensive over time and the coefficient also becomes positive. As for large size, the effect is the opposite, large package products become cheaper over time. For all regressions, the variables explain 97, 96 and 95 percent of the variation in the regression respectively. In the last time bracket we notice the effect of market share more than doubles compared to the second time bracket.

6. Conclusion & Discussion

The main goal of this study was to examine the intricate pricing methods used by businesses in the Base of the Pyramid (BOP) sector, with a focus on the relationship between market share, product size, and manufacturer size. Traditional pricing tactics frequently do not match the socio-economic characteristics of the target consumers, which makes the BOP market unusual. The study aims to provide insight into how companies of different sizes handle these difficulties in order to improve their pricing models by examining these dynamics.

The results of this study show that the size of the manufacturer and the size of the product play a crucial role in dictating the pricing structures in the BOP market. Based on their extensive market reach and available resources, larger manufacturers typically charge more for their goods than their smaller competitors, according to the report. Large manufacturers tend to offer larger-sized packages, medium-sized manufacturers concentrate on medium-sized packages, and local businesses, who are frequently limited by resources, sell smaller-sized items. This trend is especially noticeable in the packaging options.

A closer look at the panel data results reveals a varying pricing trajectory for various manufacturer sizes. The majority of businesses show an increased pricing tendency over time, with the significant exception being domestic businesses, which have been seen to lower their unit prices. Domestic businesses' price reductions are probably a calculated response to fierce competition and the need to draw in and hold on to price-conscious customers in the BOP market. Large manufacturers, on the other hand, may maintain and justify higher costs because they can leverage their well-established reputation and brand equity. The analysis also reveals a sizable strategic mismatch in the industry. Big companies can put what is known as a "strategic embargo" on smaller companies because of their vast resources and strategic clout. This embargo alludes to the competitive constraints that bigger companies place on their smaller rivals, which frequently result in unfavorable business circumstances for the latter. Small businesses are usually compelled to reduce their pricing in order to stay in business since they are unable to compete with the economies of scale and branding power of larger corporations. Sadly, this tactic frequently leaves smaller businesses in a dangerous financial position where revenues aren't high enough to pay expenses, forcing them out of the market.

Large and small businesses have different agendas, which exacerbates this situation even further. The main goals of large companies entering the BOP industry are usually profit maximization and market share expansion. They are able to do this by taking advantage of the enormous potential of the BOP market, frequently at the expense of smaller local companies. Small and domestic businesses, on the other hand, strive to expand and build a name for themselves in the market because they frequently rely more on their operations to survive. They are, however, at a disadvantage because they are unable to attain large margins. One such scenario is for big businesses to temporarily reduce their profit margins in order to overtake their smaller rivals for market dominance. However, this strategy is not commonly observed, possibly due to the broader objective of large firms to engage in poverty alleviation efforts by making their products available to the BOP market in smaller, more affordable quantities.

This research, like any study, has some limitations that impact the accuracy and generalizability of its conclusions. The fact that the data is limited to a single market in a single nation is a major constraint. The various dynamics of the BOP market across various geographies and industries might not be well captured by this restricted focus. To address this constraint, a potential resolution could involve performing a comparative evaluation of the cookie market in other nations over the same period, incorporating a developed market (TOP country) as a counterfactual. This more comprehensive method might offer more thorough insights into the pricing tactics used by businesses in various market situations.

Additionally, out of the 8,000 observations in the dataset used for this study, 5,900 come from small and medium-sized businesses (SMEs). Due to the imbalance in observations, the weighting of various manufacturer sizes was not corrected, which may have influenced the results due to the disproportionate participation of SMEs. The analysis may be skewed by the overrepresentation of SMEs, masking the actual pricing patterns among larger enterprises.

It was shown that market share of the manufacturer also had a significant impact on pricing. The research indicates that market share determined by volume has a positive and large impact on unit price, whereas market share determined by value has a considerable negative effect. Subsequent tests of collinearity reveal a strong correlation between these two variables, which raises questions regarding multicollinearity. Due to their multicollinearity, these variables' validity as indicators is called into question, and it is possible that they are not appropriate for conclusively determining the relationship between pricing strategies and market share (see appendix).

7. Appendix

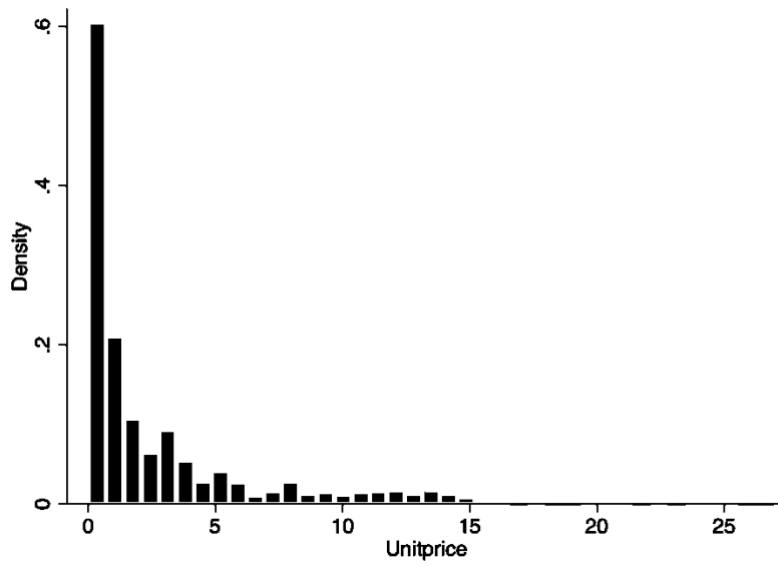
7.1. References

- Anderson, J., & Billou, N. (2007). Serving the world's poor: Innovation at the base of the economic pyramid. *Journal of Business Strategy*, 28(2), 14–21. <https://doi.org/10.1108/02756660710732611>
- Ansari, S., Munir, K., & Gregg, T. (2012). Impact at the 'Bottom of the Pyramid': The Role of Social Capital in Capability Development and Community Empowerment. *Journal of Management Studies*, 49(4), 813–842. <https://doi.org/10.1111/j.1467-6486.2012.01042.x>
- Antonecchia, G., & Bhaskarabhatla, A. (2023). How firms compete when they set identical prices: Nonprice strategies in the Indian biscuit industry. *Journal of Economics & Management Strategy*, 32(4), 733–756. <https://doi.org/10.1111/jems.12518>
- Bannister, G. (2001). *International Trade and Poverty Alleviation* (SSRN Scholarly Paper 3923397). <https://papers.ssrn.com/abstract=3923397>
- Cooney, K., & Shanks, T. R. W. (2010). New Approaches to Old Problems: Market-Based Strategies for Poverty Alleviation. *Social Service Review*. <https://doi.org/10.1086/652680>
- Guesalaga, R., & Marshall, P. (2008). Purchasing power at the bottom of the pyramid: Differences across geographic regions and income tiers. *Journal of Consumer Marketing*, 25(7), 413–418. <https://doi.org/10.1108/07363760810915626>
- Karnani, A. (2005). Misfortune at the Bottom of the Pyramid. *Greener Management International*, 51, 99–110.
- Karnani, A. (2017). Marketing and Poverty Alleviation: The Perspective of the Poor. *Markets, Globalization & Development Review*, 2(1). <https://doi.org/10.23860/MGDR-2017-02-01-05>

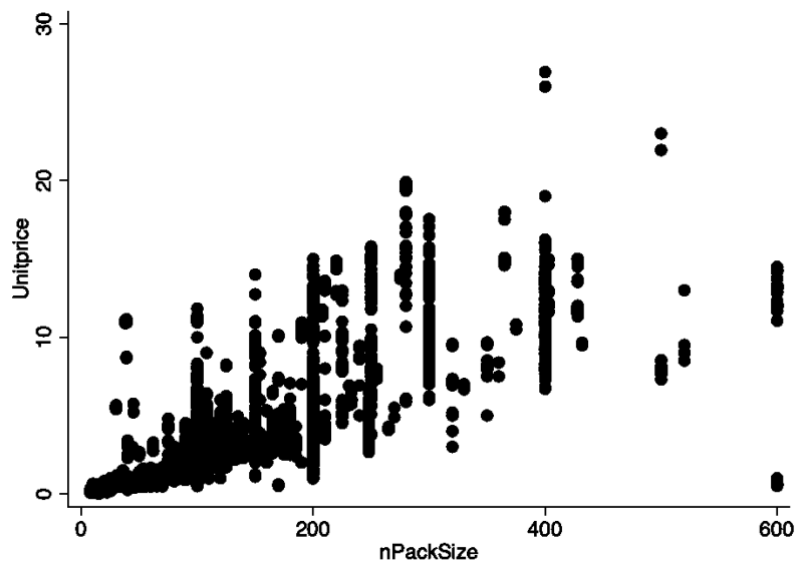
- Kolk, A., Rivera-Santos, M., & Rufin, C. (2014). Reviewing a Decade of Research on the “Base/Bottom of the Pyramid” (BOP) Concept. *Business & Society*, 53(3), 338–377. <https://doi.org/10.1177/0007650312474928>
- Loayza, N. V., & Raddatz, C. (2010). The composition of growth matters for poverty alleviation. *Journal of Development Economics*, 93(1), 137–151. <https://doi.org/10.1016/j.jdeveco.2009.03.008>
- Mathur, M. K., Swami, S., & Bhatnagar, S. (2016). *BOP Business Models and Strategy*. 1(1).
- Pitta, D. A., Guesalaga, R., & Marshall, P. (2008). The quest for the fortune at the bottom of the pyramid: Potential and challenges. *Journal of Consumer Marketing*, 25(7), 393–401. <https://doi.org/10.1108/07363760810915608>
- Prahalad, C. K. (2012). Bottom of the Pyramid as a Source of Breakthrough Innovations. *Journal of Product Innovation Management*, 29(1), 6–12. <https://doi.org/10.1111/j.1540-5885.2011.00874.x>
- Singh, D. P., Paul, J., & Sharma, P. (2022). Segmenting the Bottom of the Pyramid Consumers: Theoretical Approach. *INTERNATIONAL JOURNAL OF MARKET RESEARCH*, 64(3), 397–419. <https://doi.org/10.1177/14707853211055048>
- Suárez, F. F., & Utterback, J. M. (1995). Dominant designs and the survival of firms. *Strategic Management Journal*, 16(6), 415–430. <https://doi.org/10.1002/smj.4250160602>
- Subrahmanyam, S., & Tomas, G. J. (2008). Integrated approach to understanding consumer behavior at bottom of pyramid. *Journal of Consumer Marketing*, 25(7), 402–412. <https://doi.org/10.1108/07363760810915617>
- Warnholz, J.-L. (n.d.). *Poverty Reduction for Profit? A critical examination of business opportunities at the Bottom of the Pyramid*.

Tables & Graphs

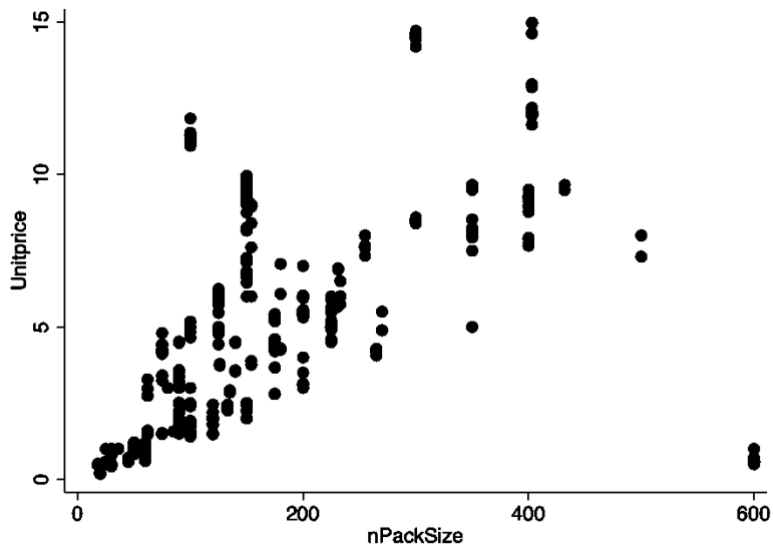
Graph 1: *Histogram of unit price*



Graph 2: *Two-way scatter unit price and package size*



Graph 3: Two-way scatter unit price and package size for multinational firms



Graph 4: Two-way scatter unit price and package size for small and medium firms

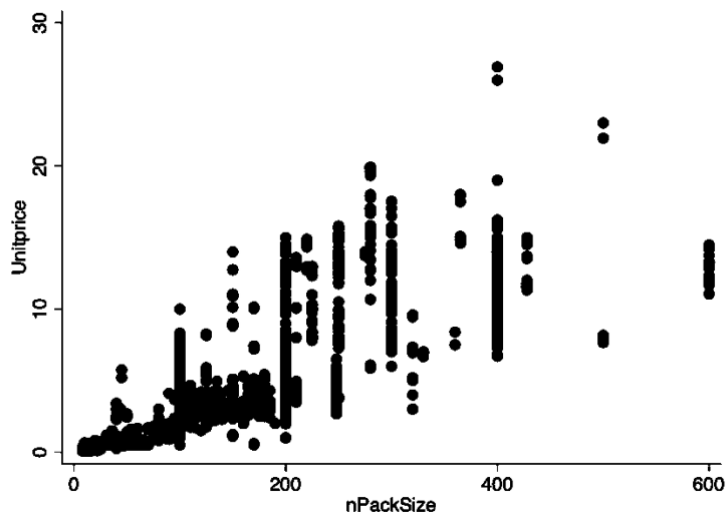


Table 6: Correlation of the market share variables

	MRKTShareVOL	MRKTShareVAL
MRKTShareVOL	1	
MRKTShareVAL	0.9874	1

Stata Code

use "/Users/diogomarques/Desktop/ELECTIVES LECTURE/Thesis/Original Dataset.dta"

Data from Nielsen

MULTINATIONALS

gen MNE= 0

replace MNE = 1 if manufacturer == "ASSOCIATED BRITISH FOODS"

replace MNE = 1 if manufacturer == "BRITANNIA"

replace MNE = 1 if manufacturer == "GRUPO NUTRESA"

replace MNE = 1 if manufacturer == "MONDELEZ INTERNATIONAL"

replace MNE = 1 if manufacturer == "NESTLE"

replace MNE = 1 if manufacturer == "MONDE M.Y. SAN"

replace MNE = 1 if manufacturer == "UNIBIS"

replace MNE = 1 if manufacturer == "UNIVERSAL ROBINA"

EMERGING MULTINATIONAL

gen EMNE= 0

replace EMNE = 1 if manufacturer == "ADAM FOODS"

replace EMNE = 1 if manufacturer == "BAKERS HEAVEN"

replace EMNE = 1 if manufacturer == "BESTWAY"

replace EMNE = 1 if manufacturer == "CONTINENTAL BAKERIES"

replace EMNE = 1 if manufacturer == "DIDESS"

replace EMNE = 1 if manufacturer == "FIESTA"

replace EMNE = 1 if manufacturer == "G.M.L."

replace EMNE = 1 if manufacturer == "H&H"

replace EMNE = 1 if manufacturer == "I.F.F.C.O."

replace EMNE = 1 if manufacturer == "MUNCHYS GROUP"

replace EMNE = 1 if manufacturer == "NUTRIFOODS"

replace EMNE = 1 if manufacturer == "OLYMPIC HERMES"

replace EMNE = 1 if manufacturer == "PRAN FOODS"

replace EMNE = 1 if manufacturer == "PT. ANEKA"

replace EMNE = 1 if manufacturer == "QUALITY FOOD"

replace EMNE = 1 if manufacturer == "RAJ AGRO"

replace EMNE = 1 if manufacturer == "REGAL"

replace EMNE = 1 if manufacturer == "SARAY"

replace EMNE = 1 if manufacturer == "SUN MARK"

replace EMNE = 1 if manufacturer == "SUNSHINE FAR"

replace EMNE = 1 if manufacturer == "TEASHOP BAKERS"

replace EMNE = 1 if manufacturer == "TWEELLIUM"

replace EMNE = 1 if manufacturer == "VEGA FOODS"

replace EMNE = 1 if manufacturer == "VIEIRA DE CASTRO"

SMALL AND MEDIUM ENTERPRISES

gen SME= 0

replace SME = 1 if manufacturer == "A&P"

replace SME = 1 if manufacturer == "A.J.C."

replace SME = 1 if manufacturer == "ALIMENTAIRE DU SUD"

replace SME = 1 if manufacturer == "ALL OTHER MANUFACTURERS"

replace SME = 1 if manufacturer == "ANI BISKUVI"

replace SME = 1 if manufacturer == "APSARA"

replace SME = 1 if manufacturer == "BORGGREVE"

replace SME = 1 if manufacturer == "BOWIN"

replace SME = 1 if manufacturer == "BIKING FOOD"

replace SME = 1 if manufacturer == "BRTCO"

replace SME = 1 if manufacturer == "CEYLON BISCUITS"

replace SME = 1 if manufacturer == "CIREPCI"

replace SME = 1 if manufacturer == "CIZMECI"

replace SME = 1 if manufacturer == "DADA"

replace SME = 1 if manufacturer == "DARSHANS"

replace SME = 1 if manufacturer == "DELI FOODS"

replace SME = 1 if manufacturer == "DIDIAN"

replace SME = 1 if manufacturer == "ELEGANCE"
 replace SME = 1 if manufacturer == "ENNAS"
 replace SME = 1 if manufacturer == "FRONTIER FOODS"
 replace SME = 1 if manufacturer == "GLOBAL ENERGY"
 replace SME = 1 if manufacturer == "GLOBAL SINAPIRE"
 replace SME = 1 if manufacturer == "GOLDEN MILLS"
 replace SME = 1 if manufacturer == "GULLON"
 replace SME = 1 if manufacturer == "HEEMANKSHI"
 replace SME = 1 if manufacturer == "HELLEMA"
 replace SME = 1 if manufacturer == "HOLLAND FOODZ"
 replace SME = 1 if manufacturer == "HUP SENG"
 replace SME = 1 if manufacturer == "HWA TAI"
 replace SME = 1 if manufacturer == "IFAD MULTI PRODUCTS"
 replace SME = 1 if manufacturer == "JENS SCHLEICHER"
 replace SME = 1 if manufacturer == "JIAXIANG"
 replace SME = 1 if manufacturer == "JIAXING MEIDAN FOOD"
 replace SME = 1 if manufacturer == "JUMBO MASTER"
 replace SME = 1 if manufacturer == "JXNG"
 replace SME = 1 if manufacturer == "K.B.I."
 replace SME = 1 if manufacturer == "K.I.F."
 replace SME = 1 if manufacturer == "KALNAPILIS"
 replace SME = 1 if manufacturer == "KATAKIT"
 replace SME = 1 if manufacturer == "KONYA SEKER"
 replace SME = 1 if manufacturer == "LAVAZZA"
 replace SME = 1 if manufacturer == "LOACKER"
 replace SME = 1 if manufacturer == "LUCKY DOLCIARIA"
 replace SME = 1 if manufacturer == "LYKON"
 replace SME = 1 if manufacturer == "MALIBAN"
 replace SME = 1 if manufacturer == "MARILAN ALIMENTOS"
 replace SME = 1 if manufacturer == "MASS"
 replace SME = 1 if manufacturer == "MAYORA"
 replace SME = 1 if manufacturer == "MERBA"
 replace SME = 1 if manufacturer == "MOVELLS"
 replace SME = 1 if manufacturer == "NEJATI"
 replace SME = 1 if manufacturer == "NIGER BISCUIT"
 replace SME = 1 if manufacturer == "ORIENT LANKA"
 replace SME = 1 if manufacturer == "P.T. UNITED"
 replace SME = 1 if manufacturer == "PAHAL"
 replace SME = 1 if manufacturer == "PARLE"
 replace SME = 1 if manufacturer == "PARLAYS"
 replace SME = 1 if manufacturer == "PICCADILLY"
 replace SME = 1 if manufacturer == "PT. ASIA SAKTIWAHID"
 replace SME = 1 if manufacturer == "PT. JADI ABADI"
 replace SME = 1 if manufacturer == "PT. SERENA"
 replace SME = 1 if manufacturer == "PT. UNIMOS"
 replace SME = 1 if manufacturer == "R.E.P.C."
 replace SME = 1 if manufacturer == "RUDRA"
 replace SME = 1 if manufacturer == "RAVI FOODS"
 replace SME = 1 if manufacturer == "S.S.R."
 replace SME = 1 if manufacturer == "SIMSEK"
 replace SME = 1 if manufacturer == "SONA AGRO"
 replace SME = 1 if manufacturer == "STELLADOT"
 replace SME = 1 if manufacturer == "STRATEGIC FOOD"
 replace SME = 1 if manufacturer == "SUMAL FOODS"
 replace SME = 1 if manufacturer == "SUNDER INDUSTRIES"
 replace SME = 1 if manufacturer == "S+LEN"
 replace SME = 1 if manufacturer == "VICENZI"
 replace SME = 1 if manufacturer == "YANGZHOU MEIZI FOOD"
 replace SME = 1 if manufacturer == "YILDIZ"
 replace SME = 1 if manufacturer == "YIRANE"

```

replace SME = 1 if manufacturer == "YIXIN FOOD"
replace SME = 1 if manufacturer == "YUMMY CHEESECAKES"
*DOMESTIC ENTERPRISES*
gen DOM= 0
replace DOM = 1 if manufacturer == "BECTOR"
replace DOM = 1 if manufacturer == "GOGA"
replace DOM = 1 if manufacturer == "HABIGANJ"
replace DOM = 1 if manufacturer == "BELOXX"
replace DOM = 1 if manufacturer == "G.P.R. FOOD"

```

```

*ManufacturerSize*
gen ManufacturerSize= .
replace ManufacturerSize =1 if MNE ==1
replace ManufacturerSize =2 if EMNE ==1
replace ManufacturerSize =3 if SME ==1
replace ManufacturerSize =4 if DOM ==1

```

```

*Market Share based on Revenue*
egen ValueTotal = total(valuein1000ghc)
egen AggValue_perMan = total(valuein1000ghc), by(manufacturer)
gen MRKTShareVAL = 0
replace MRKTShareVAL = AggValue_perMan/ValueTotal
gen MRKTShare_percentVAL = MRKTShareVAL*100

```

```

*Market Share based on Quantity*
egen VolumeTotal = total(volumein1000kgs)
egen AggVolume_perMan = total(volumein1000kgs), by(manufacturer)
gen MRKTShareVOL = 0
replace MRKTShareVOL = AggVolume_perMan/VolumeTotal
gen MRKTShare_percentVOL = MRKTShareVOL*100

```

```

*multicollinearity test*
corr MRKTShareVAL MRKTShareVOL

```

```

*Price*
gen Unitprice =.
replace Unitprice = valuein1000ghc/unitsin1000

```

```

*Package Size*
gen PackSize=regexs(2) if regexm(item,"(.*)([0-9]*ML)(.*)")
replace PackSize=regexs(2) if regexm(item,"(.*)([0-9]*G)(.*)")&PackSize==""
replace PackSize=regexs(2) if regexm(item,"(.*)([0-9.]*ML)(.*)")&PackSize==""
replace PackSize=regexs(2) if regexm(item,"(.*)([0-9.]*G)(.*)")&PackSize==""
replace PackSize=regexs(1) if regexm(item,"([0-9.]*ML)(.*)")&PackSize==""
replace PackSize=regexs(1) if regexm(item,"([0-9.]*G)(.*)")&PackSize==""
gen nPackSize=regexs(1) if regexm(PackSize,"([0-9.]*)(.*)")
destring nPackSize, replace force
drop PackSize

```

```

*interaction effects*
gen mSizeXpSize = ManufacturerSize*nPackSize
gen PriceXpackSize = Unitprice*nPackSize
gen mSizeXPrice = ManufacturerSize*Unitprice
*Variable adjusting*
drop if valuein1000ghc>500
drop if avgpriceghc == .
drop if ManufacturerSize ==.
gen Size_small = (nPackSize<=45)

```

```

gen Size_medium = (nPackSize>45 & nPackSize<=100)
gen Size_large = (nPackSize>100)
drop if valueros>100
drop if nPackSize>600
drop if Unitprice ==0
drop if Unitprice == .

```

```

*quarters*
gen month = month(date)
gen quarterstrg =.
gen quarter = string(quarterstrg)
replace quarter = "Q1" if inlist(month, 1, 2, 3)
replace quarter = "Q2" if inlist(month, 4, 5, 6)
replace quarter = "Q3" if inlist(month, 7, 8, 9)
replace quarter = "Q4" if inlist(month, 10, 11, 12)
gen Q1 = 0
replace Q1 = 1 if quarter == "Q1"
gen Q2 = 0
replace Q2 = 1 if quarter == "Q2"
gen Q3 = 0
replace Q3 = 1 if quarter == "Q3"
gen Q4 = 0
replace Q4 = 1 if quarter == "Q4"
gen nQuarter=.
replace nQuarter = 1 if quarter=="Q1"
replace nQuarter = 2 if quarter=="Q2"
replace nQuarter = 3 if quarter=="Q3"
replace nQuarter = 4 if quarter=="Q4"
gen date1 = monthly(period, "MY")
format date1 %tm

```

***H1* In BOP countries manufacturers offer smaller sized packages at lower prices compared to larger sized packages.**

```

hist Unitprice
regress Unitprice nPackSize, robust
regress Unitprice nPackSize MNE EMNE SME, robust
regress Unitprice nPackSize MNE EMNE SME unitsin1000 valueros MRKTShareVAL
MRKTShareVOL, robust
regress Unitprice nPackSize MNE EMNE SME unitsin1000 valueros MRKTShareVAL MRKTShareVOL
mSizeXpSize mSizeXPrice, robust
tway scatter Unitprice nPackSize

```

***H2* Manufacturers selling at lower prices have higher amount of sales compared to manufacturers selling at higher prices.**

```

regress unitsin1000 Unitprice, robust
regress unitsin1000 Unitprice MNE EMNE DOM, robust
regress unitsin1000 Unitprice MNE EMNE DOM nPackSize valueros MRKTShareVAL
MRKTShareVOL, robust
regress unitsin1000 Unitprice MNE EMNE DOM nPackSize valueros MRKTShareVAL
MRKTShareVOL mSizeXpSize mSizeXPrice, robust

```

***H3* Manufacturers of larger size, offer small sized packages at higher prices compared to manufacturers of smaller size.**

```

regress Unitprice Size_small Size_large, robust
regress Unitprice Size_small Size_large MNE DOM SME, robust
regress Unitprice Size_small Size_large MNE DOM SME MRKTShareVAL MRKTShareVOL
mSizeXpSize mSizeXPrice, robust

```

twoway scatter Unitprice nPackSize if ManufacturerSize == 1
twoway scatter Unitprice nPackSize if ManufacturerSize == 3

Panel data regression

egen manufacturer_id = group(item)

tabulate date1, generate(T)

gen Time =.

replace Time = 1 if T1==1

replace Time = 2 if T2==1

replace Time = 3 if T3==1

replace Time = 4 if T4==1

replace Time = 5 if T5==1

replace Time = 6 if T6==1

replace Time = 7 if T7==1

replace Time = 8 if T8==1

replace Time = 9 if T9==1

replace Time = 10 if T10==1

replace Time = 11 if T11==1

replace Time = 12 if T12==1

replace Time = 13 if T13==1

replace Time = 14 if T14==1

replace Time = 15 if T15==1

replace Time = 16 if T16==1

replace Time = 17 if T17==1

replace Time = 18 if T18==1

replace Time = 19 if T19==1

replace Time = 20 if T20==1

replace Time = 21 if T21==1

replace Time = 22 if T22==1

replace Time = 23 if T23==1

replace Time = 24 if T24==1

replace Time = 25 if T25==1

replace Time = 26 if T26==1

replace Time = 27 if T27==1

replace Time = 28 if T28==1

replace Time = 29 if T29==1

replace Time = 30 if T30==1

replace Time = 31 if T31==1

replace Time = 32 if T32==1

replace Time = 33 if T33==1

replace Time = 34 if T34==1

replace Time = 35 if T35==1

replace Time = 36 if T36==1

replace Time = 37 if T37==1

*** Subset data for time period 0-12**

preserve

keep if Time >=1 & Time <=12

xtset manufacturer_id date1

xtreg Unitprice Size_small Size_large MNE EMNE SME unitsin1000 valores MRKTShareVAL

MRKTShareVOL mSizeXpSize mSizeXPrice, re

restore

*** Subset data for time period 13-25**

preserve

keep if Time >12 & Time <=25

xtset manufacturer_id date1

xtreg Unitprice Size_small Size_large MNE EMNE SME unitsin1000 valores MRKTShareVAL

MRKTShareVOL mSizeXpSize mSizeXPrice, re

restore

*** Subset data for time period 26-33**

```
preserve
keep if Time >25 & Time<=33
xtset manufacturer_id date1
xtreg Unitprice Size_small Size_large MNE EMNE SME unitsin1000 valeros MRKTShareVAL
MRKTShareVOL mSizeXpSize mSizeXPrice, re
restore
*does not work^^^* why?
```

robustness checks

```
regress Unitprice nPackSize MNE EMNE SME unitsin1000 valeros MRKTShareVAL MRKTShareVOL
mSizeXpSize mSizeXPrice T1 T36, robust
regress valeros Unitprice MNE EMNE DOM nPackSize unitsin1000 MRKTShareVAL
MRKTShareVOL mSizeXpSize mSizeXPrice T1 T36, robust
regress Unitprice Size_small Size_large MNE DOM SME mSizeXpSize mSizeXPrice T1 T36, robust
```

```
preserve
keep if Time >=1 & Time<=12
xtset manufacturer_id date1
xtreg Unitprice Size_small Size_large MNE EMNE SME unitsin1000 valeros MRKTShareVAL
MRKTShareVOL mSizeXpSize mSizeXPrice i.date1, re vce(cluster manufacturer_id)
restore
```

```
preserve
keep if Time >=13 & Time<=25
xtset manufacturer_id date1
xtreg Unitprice Size_small Size_large MNE EMNE SME unitsin1000 valeros MRKTShareVAL
MRKTShareVOL mSizeXpSize mSizeXPrice i.date1, re vce(cluster manufacturer_id)
restore
```

```
preserve
keep if Time >=26 & Time<=33
xtset manufacturer_id date1
xtreg Unitprice Size_small Size_large MNE EMNE SME unitsin1000 valeros MRKTShareVAL
MRKTShareVOL mSizeXpSize mSizeXPrice i.date1, re vce(cluster manufacturer_id)
restore
```