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Relationship between Custom Duties and Profitability of Automobile industry: A cross country analysis of 50 countries

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Abstract

This paper investigates how import duties across different part of the world influence the profitability of automobile sectors of their respected countries across the globe. Mostly developing countries are taken under observation where automobiles are imported from outside the home country. Import duties are used as a main independent variable while other independent variables used are Interest rates, Unemployment rates, Inflation rates and GDP growth rates. Number of passenger cars sold in the country was taken as representative for the profitability of the country's automobile sector. A dataset of automobile sector of the selected 50 countries of the world was analyzed using multiple regression. The findings of the result shows a negative relation between custom duties and profitability of automobile sector in a country. This result will benefit researchers to study the impact over the entire automobile industry. Government can use this study to formulate better trade policies and improve the automotive industry in Pakistan.

Keywords: Profitability, Custom Tariff, Interest Rate, Inflation Rate, Unemployment Rate, Gross Domestic Product per Capita

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INTRODUCTION:

1.1 BACKGROUND TO THE STUDY

Automobile sector established in 1860s when hundreds of automobile industries shined. Automobiles were manufactured in small workshops during late 1890s. After that at the start of 20th century engine production started at a large scale. First line of production was introduced by Henry Ford for the production of automobiles. General Motors and Austin followed the trend of Henry Ford's production line but Japanese automakers introduced a new structure which they name "Lean Production". They tried to make manufacturing cost efficient.

During the emergence of auto industry in 1929 out of 32,028,500 automobiles, United States was the king of the industry with 90% of the world's automobile share. By the end of World War II US was leading the automobile market with 75% market share. After that in 1980 Japan took over the throne of the auto industry. Japan ruled the automobile industry around 30 years when it was overtaken by China in 2009 and hold the number one spot up till now.

Until 2016 Toyota a Japanese brand hold the highest production record with the production of 10,213,486 vehicles. Followed by Toyota, German Volkswagen produced 10,126,281. Holding the third spot, South Korean Hyundai production was 7,889,538 vehicles.
During 1950s a US auto manufacturer, General Motors started its assembling plant in Pakistan under a public limited company named National Motors Limited. Bedford truck was the first vehicle assembled in Pakistan during 1950. In 1983 Suzuki started assembling a small FX 800car that targeted the middle class peoples in Pakistan. Almost after a decay Suzuki bring 1000 and 1300 cc cars and attracted other customers. Before the establishment of Toyota Indus Motors in 1993 Suzuki enjoys the market leader place but latterly in 1994 Honda Atlas also joined the 2 monopolistic companies Suzuki and Toyota in Pakistan.

In Pakistan the automobile industry supports the GDP by 4%. It has the manpower of around 3.5 million people. 3200 plants are manufacturing and assembling 2 wheelers and 4 wheelers in different part of the country. The automobile industry is the 2nd highest indirect tax payer industry in Pakistan. Toyota, Suzuki and Honda

are the key player of the automotive industry of Pakistan. Auto Policy 2016-21 has attracted many new automobile companies to setup manufacturing plants in Pakistan.

Bank financing and ease of installments have tremendously increase the demand of the automobiles inside the country. During 2017 all-time record of 0.285 million 4 wheelers and more than 1.632 million motorcycles were produced and sold in Pakistan. Automotive industry of Pakistan is among the most rapid growing industry in Asia. During fiscal year 2018 the demand for small cars hit an increase of 29 %. Online transporters are one of the reason behind this massive increase.

If we talk about the cost structure of automobile sector, it is capital intensive and according to 2015 survey 47% of the total cost is of material. Direct labor is 21% and administration cost is 10%. Research and development and depreciation equals 6% of total cost while 3 % logistics cost is applied. Other cost that include advertising also equals 7%.

Import duties affects the overall material cost and increase in import duty eventually increases the cost of the product and vice versa. Across the world governments agreements to lower the trade and custom duties by signing most favorite nation (MFN) and other trade agreements. Currently the automobile sector faces a high duty in Pakistan which is up to 100 % for personal passenger cars. Automobile sector is the fastest growing industry in Pakistan but facing many challenges such as high import duties, monopoly of big 3 (Honda Atlas, Toyota Indus and Pak Suzuki), devaluation of Pakistani currency. Demand for electric vehicles is increasing very fast but the energy crises is also one of the major threat to this industry.

The core reason for any business is to earn profit. Profitability is the degree of financial gain. To earn profit every business entity run its operations through various activities. These activities directly or indirectly influence the profit of the business.

1.2 PROBLEM STATEMENT

Import duties are different around the world. Many countries such as Indonesia, Argentina, Albania, Norway, Japan, Iceland, Bahamas and other welcomes the import of automobiles and charge no duty on

imported cars. Their import tariff for passenger cars are zero (0%). On the other hand countries like Pakistan, Bangladesh, Egypt, Mexico and Vietnam have import duty up to 200%.

Higher import duties directly affects the cost of the product and this eventually increases the end consumer price whereas the demand for the local products increases with the increase in the price of imported products thus increase in demand of local products increases the price also. Which is evident from the prices of automakers in Pakistan as they increased the prices of their product 4 times during a year (2018). Demand for automobiles during November 2017 is 18% higher than last year November. Online cabs are one of the main reasons behind this increase and this also boosts by easy bank financings. However, government of Pakistan successfully collected custom duties and among top 10 commodities automobile sector remains on the top in generating government revenue. Increase in import of automobiles helped government to raise duty revenue by 24% and reaching the target of 97.094 billion rupees during 2016-2017. On the other hand higher import also affects the foreign reserves of the state.

Government of Pakistan give incentives to new automakers through its Automotive Development Policy (2016-21). The new policy is beneficial for Government, new automakers and end consumers. First of all higher revenues were targeted by the government in the form of Sales and Income taxes when new automakers will enter the local market. The main and most favorable point of this policy is that this is a long term policy and seems like a stable one too.

Secondly the new automakers are benefited by this policy in such a way that government has granted incentives and duty free import of machinery manufacturing and assembling plants. Further first 100 vehicles will be charged half duty by the government for testing purpose. Not only reduction on import of vehicle but also a five year 50% tax concession on localized auto parts. Now if we talked about the people, how the new policy will benefit the people in Pakistan? The answer is quiet clear as it can be seen that this policy will attract new manufacturers and assemblers in country which will definitely create competition among the existing players and the new entrants. This policy will also help in reducing unemployment rate as new industries will hire man power from within the country. Easy

availability of spare parts will lower the prices of parts. On the other hand locally manufactured small cars will attract bike riders and allow them to switch to cars.

Now the most important drawback of this policy is that it does not accounts for the transportation issues. Pakistan's roads are one of the most crowded road in the world and increase in demand of automobiles is causing more and more challenges for traffic departments. More and more cars on road means more and more traffic congestions. These traffic jams are also hurting economy of Pakistan as Pakistan is already facing energy crises. During a traffic jam, fuel of Rs.47.9 million rupees were wasted in a year as discussed in a study by Syed Hassan (2017).

1.3 GAP ANALYSIS

(Adegbie, 2011) studied that contribution of Custom Duties in the development of Nigerian economy. The result suggested Frauds, malpractices and corruptions are the major factors that lowers the custom revenue. (Abey & Velmurugan, 2018) found in their research that Asset turnover ratio, growth and size of the company have positive correlation with profitability while expenses to income ratio, age and leverage are negatively correlated with profitability. (Muhammad, 2015) concluded that there is a significant relationship between profitability and capital structure of automobile companies. (Kumar & Kaur, 2016) studied the relationship between size of the firm and profitability in Indian Automobile industry and his result showed that there is positive relationship between profitability and firm size when time series analysis is used whereas, the relations is found to be negative when cross section analysis is done.

Studying the factors that affects the profitability of Indian automotive sector (Arumugam, M, & R, 2016) found that in Indian automobile sector operating ratio is the major factor that affects the profitability and return on sales is found to be 93.4% variation by this factor. Similar study was conducted by (Munyoro, Chiinze, & Munyoro, 2016) in which they examines the impact of custom duties on small enterprises. They found that the custom and trade information is not easily available in Zimbabwe which also has a negative impact on the profitability of women cross border trades. (Jamali & Anka, 2011) studied the trade policy in developing

countries focusing on policy in Pakistan and Nigeria. They examines the short run impact of flexible trade policy is that it helps in generating revenues and helping balance of payments in a country.

All of the above mentioned studies were either restricted to country specific case studies and none have study the impact of custom tariff on automobile sector although this sector is most influenced by the custom duties in developing countries specially as the automobiles are imported in developing countries. Hence, focus of this study is on the impact of custom duties on automobile sector of 50 countries across the world. This study tries to fulfill this gap by taking the custom duty as independent variable that profitability is affected by.

1.4 RESEARCH OBJECTIVES

This research paper is based on the study of the data set of automobile sector of the selected 50 countries of the world. The major goal of this study is to examine the impact of Import duties on the profitability of the automobile sector across the globe. In developing countries mostly automobiles are imported from other countries, such as Japan, Korea, and Europe etc. Automobile is the most important and needed technology of today's world. Whether a country manufacture cars or they import from across the border but this is like a blood line for everyone. Through this research we will study about the trend of import duties in different part of the world and their impact on the profitability of countries as well as how they affect the earning of government who collect these duties.

The main objective of this study is to find out how import duties affects the profitability of the automobile industry in different part of the world. To accomplish this target following hypothesis is tested with other macroeconomic variables.

- Higher **Import duty** lead to a negative change in profitability.
- **Interest rate** in country has a significance impact on profitability.
- Profitability is affected by **GDP Per Capita.**
- Profitability is negatively affected by **Unemployment rate**.

To accomplish the target we have used data from 50 random countries. Custom duties are taken from online data available at

world integrated trade system and other macro variables at https://www.ceicdata.com/. LS regression is used to test the variables.

1.5SIGNIFICANCE

This study is very beneficial for the people who are interested in investing in automobile sectors. As this research will primarily focus on the import duty, this factor directly influence the cost and profitability of the sector. The findings of this study will also help government to formulate policies related to import and custom tariffs. Both high and very low tariffs are harmful for any economy and this research will lead to a conclusion of the impact of custom tariffs especially of passenger cars. Profitability is the major reason for any business to exist. Maximum profit not always occur by maximum sales but also by efficient and cost cutting strategies. This study will help industrialists to take active and better decisions.

1.6 RESEARCH QUESTION

Q1. High duty means higher cost and eventually high price of cars. Hence, does the profitability of an automobile sector influenced by the custom duties.

Q2.Keeping in mind the other macroeconomic variables, what is the effect of the interest rate, and inflations and a gross domestic products on the profitability of automakers.

Outline of the Study

This paper is divided into 6 sections: Section 1 is of introduction. Next section has the theoretical background of the topic. Section 3 will brief about the industry. Section 4 will cover the literature reviews relating to this topic. Section 5 explains the methodology and variables. Result will be presented in section 6 and the last section will report the conclusions and the main findings.

2. LITERATURE REVIEW

Profitability is affected by the type of company as discussed in a paper by H. B.Rafat (2013). He relate cost and debts of corporation as an indicator of influence of taxes. (Beigi, Rafat, & Panah, 2013) tried to study the impact of tax on profitability. In this research he used

descriptive analytic research approach and took data from 28 companies listed in Tehran Stock Exchange during the period 2004 to 2010. According to this study, the taxes have an overall negative impact on profitability. Their paper depicts that debt to asset ratio negatively affects the profitability but on the other hand capital to asset ratio and size of the firm positively impacts the profitability. Factors to measure the profitability that are used in his research are company size, time since its established, capital ratio, debt to asset ratio and advertisement cost.

(Zubairi, 2010) in his study tried to find out the effect of working capital management and capital structure on profitability of automobile sector of Pakistan. For his research he took current ratio as the representative of working capital management and financial leverage as capital structure of the company along with size of the firm is represented by sales and operating leverage is also taken as supplementary variables. He took data from 7 automobile companies listed in Karachi Stock Exchange from 2000 to 2008. According to the findings of this paper he finds that the financial leverage, size of the firm and liquidity ratio have positive impact on the profitability of the automobile companies whereas operating leverage has a negative impact on the profitability of auto companies.

(Princen, 2012) examined the influence of taxation on companies that have across the border businesses. Apart from this he tries to find out the impact of different taxation system for debt and equity. Researcher studied the impact of tax on corporations and finds that there is a positive relation between taxation and corporate financial decisions and hence profitability. This study focuses on the reform that are made on taxes in European Union during that period. According to Princen changes made in taxes are originated by some outside variables. Savina criticized on the tax discrimination policy of many countries where taxes on debt and equity are discriminated.

(Grainger, 2014) studied the management of customs related matter in multinational firms. Multinational firms hires custom managers who are responsible for all the documentations and clearance of imported goods from outside the border. For his research he conducted series of long interviews from 9 multinational firms. He classified industry into seven groups namely Pharmaceuticals, Technology, Food, Automotive, Retail, Media and Express Carriage

and conducted interviews with these sectors. For his research he interviewed people on telephones. He concluded that the role of custom managers matter to both supply chain management and logistics.

(Adegbie, 2011) introduced points and ways to cut off smuggling, fraud and corruption to maximize the custom revenue from import duties. Custom duties and economic development are closely related to each other. Corruption, fraud and wrong practices of custom officials negatively affects the economic development in Nigeria. This study used both primary data as well as secondary data. He suggested that Nigerian government must need to change their custom policies and trained their custom staff to avoid tax theft and smuggling in the country.

(Prachi, Arvind, & Petia, 2008) examined the effect of tariff policies and enforcement on the theft of custom duties. For this research they used the simple framework of relationship between tariff rates, evasion and enforcement. Data for their study was collected mainly from World Trade Solutions and data were collected for the period of 1987 to 2003. They found significant impact of tariffs on evasion. Further their findings showed that enforcement of tariffs were affected by evasion elasticity of different products.

(Munyoro, Chiinze, & Munyoro, 2016) conducted a research that tried to find out the role of custom and excise duties on women that have cross border trades, in Zimbabwe. For their research they gathered the data from questionnaire conducted at Beitbridge, Chirundu and Nyamapanda's borders. The result of their study show that the women across border traders were negatively affected by custom and excise taxes in Zimbabwe and this not help trader's profit. (Cosar, Grieco, Li, & Tintelnot, 2016) conducted a research in which they studied the impact of supply and demand of domestic automobile industry on the across border trades. For this the selected estimated model to study the costs that a company bear in terms of tariffs, FDI and trade. Date were collected from 9 countries from 3 continents. The data covered the period of 2007 to 2011 and used passengers market. Their finding were that there is an existence of demand factor and cost factor that give advantage to domestic market when it comes to preference. Tariffs, trade and production cost affect the segmented market.

3. CONCEPTUAL FRAMEWORK

In this paper the major variable used is Custom duties imposed on automobile products. As the custom duties are not the only macroeconomic factor affecting the profitability of automobile industry, I have used Interest rate, Unemployment rate, GDP and rate of Inflation as an independent variables along with custom duties.

3.1 Dependent Variable, PROFITABILITY:

In this paper we have used the number of passenger cars sold per capita in a country during 2017 as the measure to gauge the profitability of automobile industry in a country. Maximum profitability is the basic agenda of every business. Whether it is a small business entity or a big business with across the border branches, the main goal is to maximize the stake holder's wealth. Number of cars/capita sold during 2017 is taken as the dependent variable in regression analysis to measure the impact of custom duties on this variable.

3.2 Independent Variables:

Custom Duties:

According to Paul Bairoch (1994) tariffs are directly proportional to growth and have a positive association with growth. Import duties are the taxes that are imposed by the government on the import of certain items inside the boundary of that country. Every country has its own scale of tax on imports and exports of products. Import duty are measured as a certain percentage of value of the product or in amounts. In Pakistan it is measured in % of the price of the product.
Import duties directly affect the trade prices and trading volume of firms and higher custom duty increases the production cost and lowers the overall profit of a company. (https://www.vskills.in/certification/blog/what-is-import-duty-and-how-does-it-affect-prices-and-economy/)

During the period of globalization our world has become so small that every country is in contact with other country for the sake of trades and other bilateral benefits. Trade across the borders is so necessary that countries have made alliances and organizations for trading.

For this purpose the Harmonized System was introduced and that system has classified the products and give them a certain code that is recognized almost in every country of the world.

The harmonized system code (HS codes) are the six digit code allotted to products that are traded by countries.

For this paper we have taken only the custom duties imposed on the passenger cars. The HS code used in this study are 87.03 (Motor cars and other vehicles principally designed for the transport of persons.)

We have divided the custom tariffs in 2 groups namely Custom Tariff 1 and Custom Tariff 2.

Custom Tariff 1 contain all the cars that have spark ignition engine, whereas Custom Tariff 2 have the cars that are compression ignition engine. Among these 2 groups we have taken an average value of duty for different categories like 600cc to 3500cc and SUVs.

Inflation:

Inflation is the sudden increase in the prices of a product and services in a country. Inflation directly influence the buying power of the people living in the country. Higher rate of inflation influence the business profitability as due to high inflation cost of raw material increase, demand of wages increment also rises. On the other hand consumer demand may also fall due to higher prices of a product. Inflation in most of the countries are measured as Consumer Price Index (CPI).

According to theories inflation effects an economy in the form of purchasing power of consumers, inventory costs, changes in prices of products, borrowing, investments, employee wages and foreign exchanges. Profitability is also negatively affected by increase in inflation rate. (https://inflationdata.com/articles/2017/06/07/effects-of-inflation-on-businesses/.)

Sudden increase in prices of goods causes severe damage to the sales and eventually lower the profit of the company. Inflation causes an increase in cost of raw material and this increases the price of the product. In automobile industry's profitability inflation plays an important role as it lowers the buying power of consumer as automobile sector is not the most basic need of everyone. Lower class

and middle class people of a country take themselves out from the lift of automobile buyer's list.

Unemployment Rate:

When the people in the country are jobless they negatively affect the economy. Higher the people on job means more disposable income to invest on investment and if the unemployment rate in a country is very high that country will suffer economically. Employment not only influence the investment in a country but lesser the people on job lower the government revenue in terms of income tax.

Profitability of automobile sector may also be influenced by the proportion of population who are unemployed. When people in a country don't have job they will never go for luxuries and buy automobiles. Sales of the automobiles in a country is affected by the rateofunemployment.(https://www.investopedia.com/articles/economics/09/the-impact-of-unemployment.asp)

Interest Rate:

Interest rate are very devastating for person and for economy. Higher interest rates tend to lower economic growth and hence lower the profit of firms in an economy as the higher interest rate reduces investments and consumptions and affects the sales of companies in thatregion.(https://www.economicshelp.org/macroeconomics/monetary-policy/effect-raising-interest-rates/)

Interest rate or the deposit rate is the amount of percentage one get if he/she deposit in banks or financial institutions or invests in government securities. According to Keynesian theory of interest rate the rate of interest depends on the demand and supply of money in the market.

Interest rates in certain countries fall below zero %. Government fixes the interest rate for certain fiscal period in a country. According to classical theory of interest rate, it depends upon the demand and supply of the savings. Higher interest rate increases the cost of borrowing and hence lower the investment in the country.

GDP:

Strong GDP growth encourages firms to invest more in business through high wages and more jobs opportunities. Firms grow with the

strong GDP and earn favorable profits. (https://www.tandfonline.com/doi/full/10.1080/23322039.2017.1405581)

Another major factor is GDP that has an influence on the profitability and sustainability of business in a country. GDP growth rate is the measure of growing economy. It measures how fast or slow the economy of a country is growing with respect to the last period. Lower GDP growth rate in a country results in the less production and increases the unemployment in a country and lower the living standard of the people living in that country. According to classical theory the GDP is a self-regulating factor which means that GDP of a country works on a self- adjusted mechanism. Say's law states that when an economy reaches a certain level of real GDP it has that income which is needed to buy the goods produced in a country.

4. DATA AND METHODOLOGY

This section of the paper will focus on the variables and the methods that are used to gather the data and presentation of those data, followed by the hypothesis and statistical test to look for result.

4.1 Data:

Data is collected from a randomly selected 50 countries. Custom tariff 1 and custom tariff 2 are the average of custom tariffs of cars with spark ignition engine and compression engine. Custom tariff of 2017 is collected from World Integrated Trade Solution's website https://wits.worldbank.org/. Motor vehicles sold per capita is taken as the Profitability of an automobile sector of a country. The data for this variable is taken from https://www.ceicdata.com

Other variables used in this study are Interest rate, rate of Inflation, Unemployment rate, and Gross Domestic Product per capita. Data for these variables are taken from https://tradingeconomics.com and https://wikipedia.org

Country	Custom Tariff 1	Custom Tariff 2	Motor Vehicles sold per capita
Pakistan	68	70	0.00086
Bangladesh	141.86	231.40714	0.00009
UAE	5	5	0.0274
Nepal	80	80	0.0002
Cambodia	35	35	0.00005
Indonesia	0	0	0.0032
Argentina	0	0	0.01189

Mexico	21.666	34.047143	0.0088
Malaysia	21	21	0.0164
Magnolia	5	5	0.00004
Myanmar	14	15.714286	0.00002
Albania	0	0	0.00082
Thailand	5	5	0.00473
Philippines	30	30	0.00117
Brunei	16	18.571429	0.03021
South Africa	25	25	0.00747
India	125	125	0.00231
Norway	0	0	0.0323
Malta	18	18	0.01761
USA	2.5	2.5	0.02095
Canada	6.1	6.1	0.01856
Australia	15	15	0.03991
Japan	0	0	0.03279
Turkey	10	10	0.00898
Mauritius	68	65	0.00641
Iceland	0	0	0.05703
Bahrain	5	5	0.02778
Serbia	12.5	12.5	0.00328
Sri Lanka	30	27.857143	0.00117
Tanzania	25	25	0.00005
Kenya	25	25	0.00005
Uganda	25	25	0.00007
Bolivia	10	10	0.00152
Burundi	25	25	0.00003
Brazil	35	35	0.00774
Bahamas	0	0	0.00818
Egypt	49.868	65.535714	0.00234
Kuwait	5	5	0.03318
Chile	6	6	0.01294
S. Arabia	5	5	0.01923
Lebanon	5	5	0.0085
LAO P.D.R	0	0	0.00059
Algeria	13	15	0.00228
Jordan	0	0	0.0018
Vietnam	55.946	57.737143	0.00166
China	25	25	0.01777
Kazakhstan	9	9	0.00467
Oman	23	13.571429	0.03379
Yemen	0	0	0.00007
Paraguay	13	13.571429	0.0023

Analysis

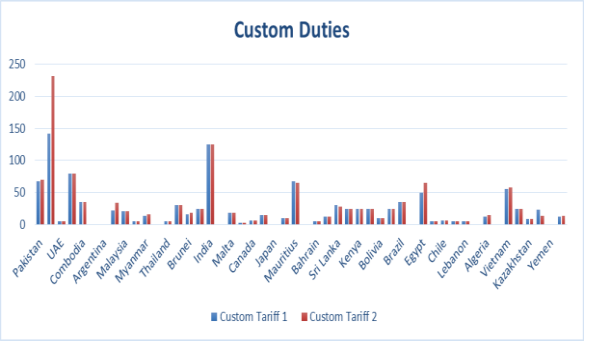
Custom tariff 1 in above data represent the average tariff of cars having spark ignition engine range from 600cc to 3500cc and SUVs. If we look at the table we can see that in most of the countries this custom duty is 0% - 35%. Approximately 43 out of 50 countries have less than 40% custom duty on cars having spark ignition. 4 out of remaining 7 countries have custom duty ranging from 36% to 70%. And rest of the three countries have higher custom duty that is more than 70% on cars with spark ignitions.

Second variable presented in the above table is custom tariff 2 that includes the average of cars of 600cc to 3500cc and SUVs but with a compression engine. Trend of custom tariff 2 is not very

different as of custom tariff 1 but this is little bit higher than the previous tariffs. In this category of tariff the % ranges from 0% to 231.4%. Custom duty on cars 0% to 50% are 44 countries out of 50. 4 out of 50 countries have 50% to 100% custom duty whereas on 2 countries have custom duty more than 100%.

Motor Vehicle sold per capita of a country is taken as Profitability of the automobile sector and as the dependent variable in this study. Iceland has the most number of cars sold per person which is approximately 0.05. Myanmar is on the last place with 0.00002 cars per capita. If we analyze the data in an interval we can see that 9 out of 50 countries have 0.00002 to 0.00009 motor vehicles sold per capita while 15 countries have 0.00059 to 0.00328 motors sold per capita. Further 9 more countries out of 50 have 0.00467 to 0.00898 automobiles sold per capita during a year. Rest of the 17 countries have per capita sold greater than 0.01.

Graph 1: Custom Duties.

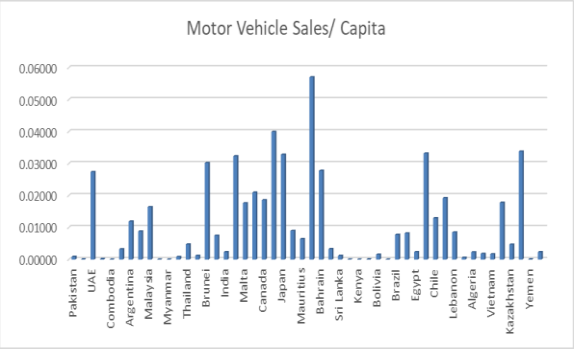


The above graph shows the custom duties that are imposed in different countries of the world. If we look at the graph it is observed that the highest custom duty is more than 200% and it is of the cars of category diesel and semi diesel while the max duty for spark ignition cars it is slightly less than 150%.

In Pakistan custom duties for spark ignition and compression ignition are almost equal.

Out of 50 countries 23 countries has less than or equal to 10% import duty. 21 countries has its custom duty range between more than 10% and less than 50%.

Graph 2: Motor Vehicles Sold per Capita.



Iceland enjoys the highest number of motor vehicle sold among 50 selected countries. While the lowest number of automobile sold per capita was observed in Myanmar during 2017. 0.01082 is the average number of vehicles sold per capita in the selected 50 countries around the globe. But if we analyze the data in a broader perspective we came to know that about 80% of the countries in our research have less than or equal to 0.02 number of vehicles sold per capita during 2017. Only 20% or 10 countries have greater than 0.02 motors vehicles sold per capita.

Descriptive Statistics

Table 2: Descriptive Statistics

	INFL	GDPPC	INT	UNEMP	CT1	CT2	MVSCAPITA
Mean	4.287400	14949.88	5.709400	6.924920	22.28880	24.56226	0.010824
Median	3.090000	7207.000	4.625000	5.065000	13.00000	13.57143	0.004700
Maximum	25.68000	90317.00	24.00000	35.00000	141.8600	231.4071	0.057030
Minimum	-3.800000	218.0000	-0.100000	0.300000	0.000000	0.000000	0.000002
Std. Dev.	5.434105	19128.13	5.087386	6.383907	29.84471	38.87833	0.013320
Skewness	2.802181	1899423	1.770763	2.418824	2.378877	3.529325	1.422448
SKurtosis	10.91077	6.572005	6.380413	10.33470	8.949463	17.84778	4.502145

The result of descriptive statistics shows that the mean inflation of the selected 50 countries is 4.29% while the mean of gross domestic product per capita is 14949.88. Average interest rate across these countries is 5.7%. Whereas the average custom duties in these countries is 22.2 % for spark ignitions and 24.56 for diesel or semi diesel automobiles. The average of the dependent variable is 0.010824 which means that single car is sold for every 100 persons.

If we take a look at the medians of the variables it is observed that the middle value of inflation, GDP per capita, interest rate, unemployment rate, custom duties and motor vehicles sold are 3.09, 7207, 4.625, 5.064, 13.0, 13.57 and 0.047 respectively.

Maximum inflation is recorded in Argentina during 2017 which is 25.68%, while the minimum inflation and GDP per capita is recorded -3.8% and 218 respectively in Burundi. On the other hand maximum gross domestic product per capita is recorded 90317 in Norway in 2017. Japan hold the 1st position in minimum interest rate with -0.1% rate while the highest interest rate observed in the data is 24% which is in Turkey. Burundi take the leading place in number of people unemployed which is 35% and a minimum unemployment rate is recorded during 2017 is 0.3% in Cambodia. 141% and 231% are the highest custom duties that are imposed by the government of India and Bangladesh respectively, while some countries have nil custom duty. Iceland took the lead in the number of cars sold per capita.

Standard deviation of inflation 5.4 which shows that the data spread is not very large, it is somewhere near the mean. But the data is largely deviated from mean when we look at the GDP per capita and custom duties. Rest of the variables have almost the same result of deviation as inflation. By this result we can conclude that the inflation, interest rate and unemployment rate are almost same in different countries of world, but the gross domestic product per capita is not same.

Inflation, interest rate, unemployment rate and motor vehicle sale have kurtosis greater than 3 which makes them long tail (positive skewed).

Table 3: Correlation

	INFL	GDPPC	INT	UNEMP	CT1	CT2	MVS CAPITA
INFL	1						
GDPPC	-0.158	1					
INT	0.811	-0.3502	1				
UNEMP	0.1162	-0.2154	0.2138	1			
CT1	-0.0628	-0.3495	0.0773	-0.0744	1		
CT2	-0.0193	-0.3091	0.0091	-0.0744	0.9623	1	
MVSCAPITA	-0.183	0.8167	-0.3464	-0.2718	-0.3211	-0.2988	1

4.2 Correlations

Table 4 shows the correlation between the variables. It is observed that inflation has weak negative relation with Gross domestic product per capita while it is strongly uphill correlated with interest rate. No linear relationship is found between inflation and custom duties. However, weak downhill negative relation lies between inflation and unemployment rate and motor vehicle sold per capita.

GDP per capita has a weak negative relation with all other independent variables but has a strong positive relation with motor vehicle sold per capita.

Interest rate has a weak but positive relation with unemployment rate in a country and a weak negative relation with motor vehicle sold. It has no relation with custom duties.

Unemployment rate and motor vehicles sold have a weak negative relation. On the other hand custom duties have weak negative relations with GDP per capita and motor vehicles sold per capita while it is perfectly uphill correlated with other custom duties.

5. Regression Methodology

For the testing, we used multiple regression. The data covers the values from 2017 and it comprises of selected 50 countries from all over the world including Asia, Africa, Australia and Europe. Custom duties are classified into two portions, one comprising of automobiles with spark ignition and the other is compression ignition (diesel or semi diesel). Equation to be tested can be written as:

$$PF = \beta_0 + \beta_1 CT1 + \beta_2 CT2 + \beta_3 GDPPC + \beta_4 INFL + \beta_5 INT + \beta_6 UNEMP$$

Where:

PF = Profitability
CT1 = Custom tariff (spark ignition engine).
CT2 = Custom tariff (compression ignition, diesel or semi diesel).
GDPPC = GDP per capita
INFL = Inflation
INT = Interest rate
UNEMP = Unemployment rate

The expected result of the study is concluded in the following table:

Table : Expected Linkage

Variables	Measures	Expected Linkage with Profitability
CT1	Custom tariff %	Negative
CT2	Custom tariff %	Negative
GDPPC	GDP per capita of 50 countries	Positive
INFL	Inflation of 50 countries	No affect
INT	Interest rate of 50 countries	Negative
UNEMP	Unemployment rate of 50 countries	Negative

Results

Table : Pooled Regression Result

Dependent Variable: MVSCAPITA
Method: Least Squares
Date: 04/09/19 Time: 12:04
Sample: 1 50
Included observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.005576	0.003060	1.822229	0.0754
INFL	-5.82E-05	0.000380	-0.153180	0.8790
GDPPC	5.30E-07	7.05E-08	7.517735	0.0000
INT	-8.27E-05	0.000424	-0.194986	0.8463
UNEMP	-0.000215	0.000189	-1.142230	0.2597
CT1	2.68E-05	0.000148	0.181180	0.8571
CT2	-4.33E-05	0.000111	-0.391444	0.6974

R-squared	0.683816	Mean dependent var	0.010824
Adjusted R-squared	0.639697	S.D. dependent var	0.013320
S.E. of regression	0.007996	Akaike info criterion	-6.690697
Sum squared resid	0.002749	Schwarz criterion	-6.423014
Log likelihood	174.2674	Hannan-Quinn criter.	-6.588762
F-statistic	15.49943	Durbin-Watson stat	1.758894
Prob(F-statistic)	0.000000		

R-squared is measured 0.683 which means that it is approximately equal to three quarter that the profitability of automobile industry across the world is measures of all 6 independent variables. Approximately 15.6 F- statistics shows that the model is not very bad. Durbin-Watson test shows a result of approximately equals to 2 which means that there is no autocorrelation detected in samples. This means that the variables are independent from each other. The overall result suggests that the null hypothesis can be accepted.

Moving towards the significance of each individual variables it can be observed that the p-value of all the independent variables are much greater than 0.05 this means that we cannot reject the null hypothesis. This implies that 1% increase in the import duties decreases the profitability of the automobile sector by 0.000058%. Similarly a percent increase in the interest rate will eventually lead to a decline in the profitability by 0.000082%.

It is strongly evident that the profitability of the automobile sector is affected by the GDP per capita of a country. 1 % increase in the GDP per capita of a country will increase the profitability of the auto sector by 0.00000053%.

5.1 Discussions:

Profitability of a firm is affected by many factors that includes micro and macroeconomic factors, controlled and uncontrolled factors etc. This study shows a negative relation of custom duty and profitability. Theories also validate the result as the higher custom duty tends to increase the cost and lower the profit of an automobile sector.

On the other hand if we look at the interest rate the result reflects that increase in interest rate will lead a negative increase in profitability of an automotive industry. The result supports the existing theoretical argument that interest rate have a negative effect on firms profitability as rise in interest rate lower the economic growth and eventually lower the profit of industries.

GDP per capita is the back bone of every economy, this is the major indicator which reflects the real face of an economy. Theories suggest that a better and strong economy with higher GDP per capita improves the profitability of firms that are operational in the country. Our result validates the theoretical arguments and support this which shows that higher GDP per capita will increase the profitability of an automobile sector of a country, people have more income and investments and spending in an economy both increase which will benefit the automakers and dealers to earn more profit by expending their business and supply chain.

Unemployment rate when cross the certain limit become a bug in an economy which negatively affects the individuals whether employed or working as well as it hit economy very badly. Street crimes in cities also increase and the country become unstable. Theories suggests that unemployment imposes a negative effect on businesses in term of their returns, earnings and customer retention. It is a part of macroeconomic factor and disturbing one factor means whole economy will be disturbed. Our findings support the literature where GDP per capita has a negative impact on profitability of automotive industry in Pakistan.

The results of this study can be useful for the government organizations dealing with taxes and revenues. Imposing correct amount of duties on automobile sector can bring in huge revenue in term of import duties. Higher import duty is not the only solution to increase government revenues, lesser duty attract more and more importers which eventually benefits the government.

On the other hand automakers or firms associated with automobile if get a proper and better platform for their business can expand their business which will be beneficial for firm as well as for the society. More new job opportunities build up in an economy strengthening the economy as well as the firm along with individuals.

If we talk about consumers than definitely with revised and low custom duties reduces the overall costs of the automobiles and lower classes of the society can also afford their own vehicles.

6. CONCLUSION:

Custom Duties are charged by every government on entrance or exertion of goods from a country. Some countries have made trade colonies where they welcome favorite nations to trade with them with as low as 0% custom duty.

In this paper we try to find out how these custom duty influence the profit of an automobile sector in a country. Study on Profitability of automobile companies were done earlier by (Zubairi, 2010) where he discussed the impact of changes in working capital and capital structure of the firm on profitability. (Beigi, Rafat, & Panah, 2013) studied the impact of taxes on profitability while Andrew Grainger (2014) studies the impact of custom management in Multinational Firms. The gap covered in this paper is custom duties which highly affect the profitability of an automotive sector in the world especially where auto sector is dependent on import of products. For this paper we used Number of Motor Vehicles Sold per Capita of a country as a measure of Profitability as a dependent variable. On the other hand custom duties are taken as independent variables along with interest rate, rate of inflation, unemployment rate and gross domestic product per capita. We used the data sample of randomly selected 50 countries from all over the world and cover the period of 2017. Secondary data is collected from World Integrated Trade

Solution's website https://wits.worldbank.org/. Motor vehicles sold per capita is taken from https://www.ceicdata.com. Other independent variables are taken from https://tradingeconomics.com and https://wikipedia.org.

The result strongly shows the following conclusion:

- Import duty has a significant negative impact on profitability.
- Interest rate in country also has a negative impact on profitability.
- Profitability is positively affected by **GDP Per Capita.**
- Profitability is negatively affected by **Unemployment rate**.

The above result validates the theoretical arguments as profitability is negatively influenced by import duties, interest rate in a country, and unemployment rate, while it has a positive relation with Gross domestic product per capita.

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