Finance, Economics and Applied Research Journal
Vol. 2, No. 1, March 2015, pp. 1 - 10
Available online at http://fearj.com/

Research article

Relationship of macroeconomic indicators GDP and GDP per capita with farm tractors in Mexico

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Abstract

At present agriculture in Mexico is going through a difficult situation due to many factors (lack of productivity, depletion, natural disasters such as floods and droughts, lack of good policies, urbanization, globalization and demographic changes). This has generated poverty, migration and lack of food supplies recourse being had to import these. If Mexico wants to reduce poverty, migration and other social problems must initiate appropriate planning of increased production of domestically manufactured tractors, looking for the best strategy to achieve because the data do not lie, more tractors more GDP per capita .By following the example of India, China, Turkey. It is necessary to continue this analysis because preliminary data confirm that there is a positive relationship between the number of tractors in a country and GDP per capita income.

Keywords: Tractor, México, Macroecomics, GDP per cápita, GDP.

Introduction

At present agriculture in Mexico is going through a difficult situation due to many factors (lack of productivity, depletion, natural disasters such as floods and droughts, lack of good policies, urbanization, globalization and demographic changes). This has generated poverty, migration and lack of food supplies recourse being had to import these. Since then the only option for increasing agricultural production is to increase productivity. Mexico is a developing country whose main source of wealth was agriculture, but due to the fact that priority was given to industry and services, this has changed, but for this again the importance it had, it is necessary that appropriate measures are taken.

In Mexico there are two forms of agriculture

1. A poorly developed agriculture with little mechanization, using traditional farming systems for subsistence crops.

2. Commercial agriculture, mechanization from acquiring high-tech equipment in efficient farms also turning their production for export.

The first is most needed this mechanization to move from a subsistence to a highly competitive trading system.

The main problem of the Mexican economy, is the uneven growth and structural imbalances in the various productive sectors, because it has given priority to non-agricultural activities and the accumulation of capital, deteriorating primary production and a suitable structure of income distribution. The objective is to analyze and highlight the relationship between the number of tractors and GDP.

Macroeconomics is the part of economics that deals with the general study of economics, by analyzing aggregate variables as the total amount of goods and services produced, total income, the level of employment, productive resources the balance of payments, exchange rate and the general behavior of prices. Macroeconomics can be used to analyze what is the best way to influence policy objectives such as growing the economy, achieving price stability, promote employment and obtaining a sustainable balance of payments and balanced.

Macroeconomics bases its analysis on data derived from observation and statistics, measurement and study of these shows the success or failure of an economy. The main data used in macroeconomics are: The macro figures, drawn from the National Accounting summarized in a single figure the monetary value of economic activity, the most widely used indicator is the GDP (gross domestic product - GDP) which measures the value of all goods and services produced by a country during a year. It is understood that the ultimate goal of economic activity is to provide goods and services to people who supply a greater quantity of goods provides a successful economic system. The variations of gross domestic product shows the evolution of output growth. Samuelson (2005).

The service sector is the largest component of GDP: 65%, followed by the industrial sector at 31% (data 2009). Agriculture, as a percentage of GDP has steadily decreased and plays a diminishing role in the economy. In 2009, agriculture accounted for only 4% of GDP, while in 1980 it was 7% and 25% in 1970. The labor force is estimated at 47 million (data from 2009) of people of which 13.7% are employed in agriculture, 23.4% in industry and 62.9% in the services sector. However, the structure of the ejidos (small communal farm property), agriculture still employs a large percentage of the workforce, most of whom grow subsistence, while in industrialized nations the percentage of labor force in agriculture is 2- 5%, which is highly mechanized. Without a major agricultural machinery industry, Mexican agriculture, in which two-fifths of the economically active population work in it, their productivity is reduced, as is manifested in its contribution to gross domestic product.

Also this has been a reflection of the economic models promoted in the country, which are (Nieves 2015):

a.-The import substitution model. b.-The model of "stabilizing development" c.- The Neoliberal model.

These models have not led the country on the path of progress and poverty reduction, for various reasons that are beyond the scope of this paper.

Agricultural development and progress of a country or region depend heavily on human capacity and animal or motorized power available per unit area; justified then, the provision and proper use of tractors and combines, as essential for the effective production process and the growth of the agricultural sector plays a key role in reducing poverty and social inequality condition.

Economic development can be defined as the ability of countries or regions to create wealth in order to promote and maintain the prosperity and economic and social welfare of its inhabitants .The economic development is a process of greater and better use of production factors obtained through increased use of capital and modern technology in the production process and aims to substantially increase the standard of living of the popular sectors, in a reasonably short period. The level of development of a society is identified with income per capita, both concepts have some objective basis in observation of a chain of relationships established between income per capita and the facility to meet the needs of individuals making up a society. (Aguirre1969).

Economic development is identified with the improvement in the provision of products for both consumption and production, measurement will be linked to the National Accounts. From it, it is accepted that the best indicator of productive activity of a country is its GDP.

The country that pays attention to the mechanization of agriculture has a different level of life of one who disregards this, since it is the trigger of the progress of its economy, as it not only promotes agriculture and livestock but also contributes to industrial development by providing tools, motors and machines for agriculture. (Negrete 2006).

Technological decline in agriculture in Mexico is notable as (Cadena 1997),reported that there was a power deficit of 4'140, 557.6 kW (5'553, 323 Hp), 79.333 units of tractors 52.19 kW (70 Hp) and same reports that the industry had a capacity to produce up to 19,000 units a year, adding 10,000 to 9,000 that occurred, that would cover the deficit in 8 years of 79.333 tractors, but for 2012,(Negrete 2013) found that the deficit is 557.036 tractors.

It is understood by tractors, vehicles constructed essentially for hauling or carrying another vehicle, appliance or load. Agricultural tractors are self-propelled vehicles for the operation of the working bodies of agricultural machines. Therefore, as a basis in the construction and operation of tractors must take into consideration that each agricultural region, depending on the natural conditions and production technologies used, for each agricultural operation should employ a particular tractor, (Negrete 2013 cited by Sanchez 2014) coupled with the corresponding agricultural implements, ensures the greatest technical and economic effect, the best performance, a

high quality of work and minimum consumption of labor and means per unit of production obtained. Like all agricultural machines has been an evolution and adaptation thanks to which, today, are the most useful machines in agriculture serving as an index to measure the degree of mechanization of agriculture of the countries.

Growth rate of more than 5 per cent in agriculture is essential to attain macroeconomic stability, rapid growth of national income, effective employment generation, securing distributive justice and a reduction in rural poverty levels. Agriculture is a sector capable of accelerating growth, reducing poverty, containing inflation and improving the quality of life of its citizens. Areas needing attention in the short term are rural infrastructure, agricultural terms of trade, promoting investment, formulating land use policy, farm mechanization (Saleem 2015).

Materials and Method

To collect information searches and agricultural tractors GDP in the country and the world were made in printed data bases and Internet importers and distributors, scientific journals, professional thesis, newspaper articles, data bases. Compared the number of tractors and tractors per area versus GDP and per capita GDP of leading countries with Mexico.

Results and Discussion

Country	Tractors Year 2000	Ranking tractor year 2000	Tractors Year 2003	Ranking tractor year 2003
United States	4 800,000	1	4 760,000	1
Japan	2 030,000	2	2 030,000	3
Italy	1,750,000	3	1 680,000	4
India	1,520,000	4	2 530,000	2
Poland	1,310,000	5	1 370,000	5
Germany	1,030,000	6	944,000	9
Turkey	905,000	7	997,620	7
China	841,000	8	995,421	8

Brazil	806,000	9	806,000	11
Russia	785,000	10	586,000	13
Argentina	280,000	12	299,620	21
Mexico	185,000	24	324,890	17

Table 1 number of tractors leading countries in 2000 and 2003source author with dates from www.nationmaster.com

Country	GDP $ dollars Billons 2012	Ranking GDP 2012	Tractors per 100 sq.Km 2009	Ranking tractors 2009
USA	16,163.2	1	271.2	8
Japan	5,954.2	3	4532.1	1
Italy	2,091.8	8	2117.1	2
India	1,858.7	10	128.5	10
Poland	496.2	23	1257.9	3
Germany	3,533.2	4	838.3	4
France	2686.7	5	635.3	6
Turkey	788.9	18	395.3	7
China	8,229.5	2	81.8	14
Brazil	2,248.8	7	116.9	11
Argentina	603.2	21	87.7	13
Mexico	1,186.5	15	97.7	12

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Table 2 GPD, ranking GPD ,Tractors, ranking tractor in the world and Mexico .source author with dates from World Bank

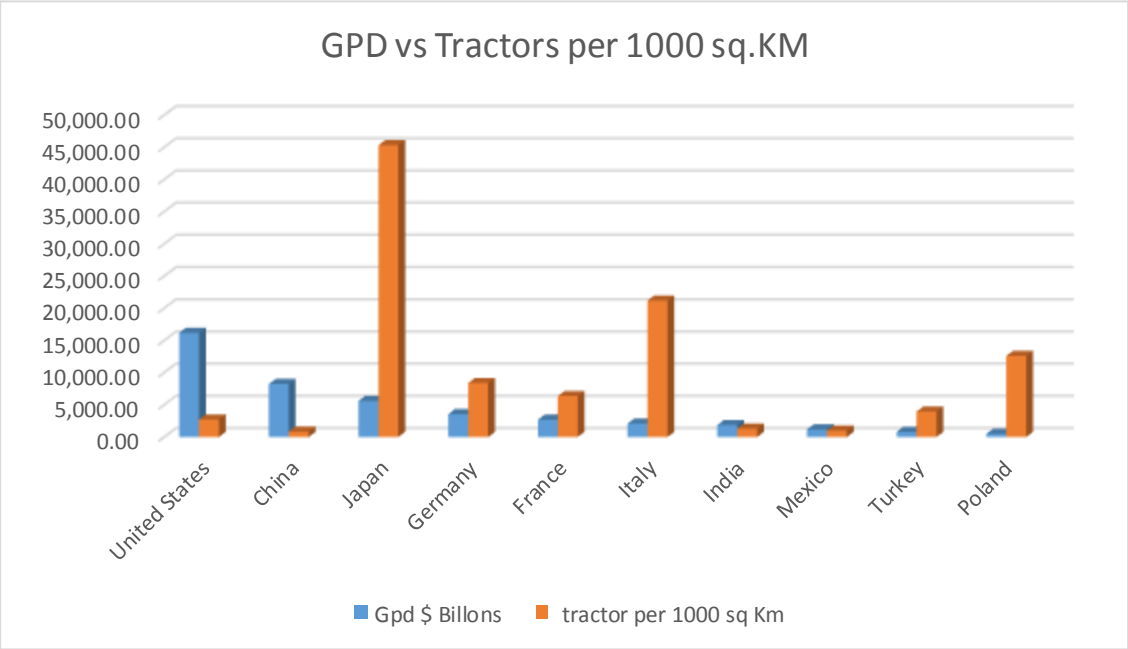

Figure 1 Tractors VS. GDP selected countries source the author with dates from World Bank

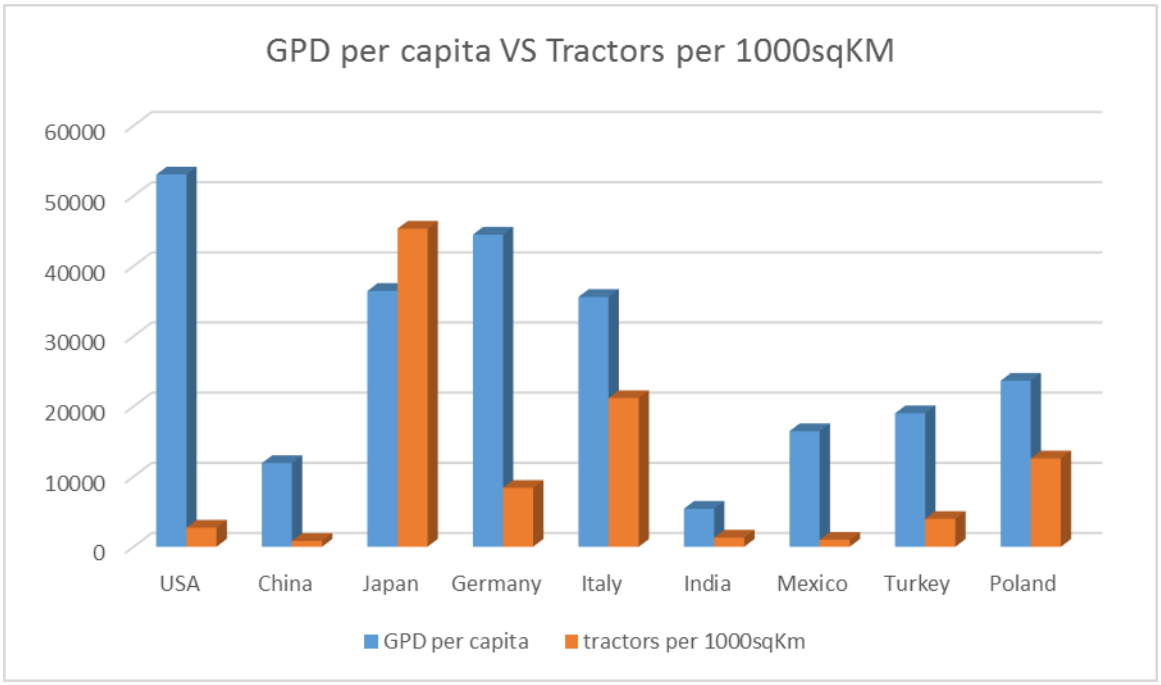

Figure 2 Tractor VS. GDP per capita selected countries source the author with dates from World Bank

In Table 1 is analyzed with the leading countries total amount of tractors.Table 2 shows the ranking of countries with the highest GDP is analyzed and compared to the number of tractors. Undeniably, the ratio of the number of tractors between the GDP of a country and the number of tractors used in agriculture, a fact demonstrated by the ranking of countries according to GDP generally coincides with the ranking of the number of tractors it possesses. In Figure 1 and 2 is shown as in Mexico has been neglected to the capitalization of agriculture in terms of the number of tractors, for countries with lower GDP have more tractors than our country. Mexico has become an exporter of agricultural tractors due to free trade agreements, as they attracted large manufacturers such as John Deere, CNH and AGCO have assembly plants of medium power tractors, as they use the country springboard to export their products to the United .Unidos huge market. And Canada without duties, the level of integration is approximately 50%, with own production of machined using local inputs and importation of higher value-added components (engines, transmissions), which are assembled directly, so the same parts as (Donoso 2007), Mexico has some significant competitive advantages as a skilled workforce and low cost, excellent road and port infrastructure, and access to basic inputs like steel in satisfactory quality. At present, Chinese companies importing tractors are tractors Photon Mexico, Tractors JINMA imported to Mexico under the brand "King Harvest" and YTO tractors .Only the Photon brand tractors assembled in Veracruz. Other companies currently importing tractors to the country Finnish origin are Valtra tractors with join at a plant in Tlaquepaque, Jalisco, Belarus Russian origin;. that was a model of tractor T-25 was assembled at the plant Cd.Sahagún until the plant closed in 1989 . Kubota Japanese origin who since 1984 has tried inserted into the Mexican market has not fulfilled expectations and they are not interested because they have the capacity and quality to be leaders in the Mexican market. However, a concern of the companies already positioned in the domestic market, is that the conditions of competition are not equal, since the certification process builder tractor is very strict and costly; and these new companies are being given more opportunities to not be required quality standards required. Here it is necessary that the policy regarding the supply of tractors is clear, (Negrete 2014.2015), because on one side for a long time supporting companies that assembled in the country was promoted, which since 1966 were who had access to the domestic market by the Law on the Promotion of Industry New and Necessary (Gallardo 1977) .But now accessing different brands not be required allowed the process corresponding to all without distinction certification, and this affects the capitalization of the field in Mexico for return to proliferate brands of tractors as even before 1965 in which concurred in the domestic market 13 brands of tractors, farmers here are unprotected because Chinese companies are offering lower power tractors and lower prices, which were never previously offered (Negrete 2014,2015).How convenient would be to require importers to assemble tractors in the country with a rate similar to that of transnational corporations national integration, since the country has demonstrated quality and capacity in this area, as evidenced exports power tractors half of these companies. With the above industry of capital goods for agriculture would be strengthened, because not only medium power tractors, but also low power, and farmers would be exported could purchase a tractor according to your needs of your property and procurement capacity . Also you can follow the example of Argentina Apache Company has proposed to manufacture a tractor 100 Hp less to power in a joint production project involving the Indian manufacturer of

tractors and agricultural machinery Sonalika. This example is not impossible to make available for the plant with the federal government in Cd.Sahagún and I join Soviets low power tractors. (Negrete, 2006), this factory can offer some of the most important manufacturers of tractors world because according to (Edwards 2002),India and China are the leaders in the segment of 20-30 Hp power tractors. And in the segment 31-40 Hp India and Turkey are the leading tractors primitive design and Japan and Italy Modern design tractors, so Mexico should seek alliances with Hindus companies that are leaders in the segment of Hp 20-30, and 30-40 Hp power tractors that are not assembled in the country (if Mexico want is a production of tractors primitive design) and with some Japanese company for the segment of 30- 40 Hp tractors if what Mexico want is a modern design . I mention tractor companies in India or Japan, as they are the most viable, since the Chinese companies hardly would install an assembly plant with a high percentage of national integration. The mention of Japanese companies, it is because in the country an assembly Japanese company cars NISSAN factory is installed, which has been successful for several years, the question is because it has never tried by the Mexican government installing a Japanese tractor plant are much higher quality than the Chinese .The recommendation of Indian companies is as follows; India has twelve tractor manufacturers, two manufacturers of cultivators, harvesters 48 manufacturers and 546 manufacturers of tractor parts and accessories. The growth in tractor industry has been rapid with 881 tractors in 1961, 310,000 tractors in 2005, in 2013, India produced 619,000 tractors accounting for 29% of world's output, as the world's largest producer and market for tractors (Anonimous 2015).

India has emerged as the leading producers of tractors and manufactures a third of global output and over 50% of tractors in the category of less than 60 Hp. Mahindra & Mahindra the largest tractor manufacturer in India established assembly plants in the United States, Australia and a manufacturing plant in China, also is trying to acquire some plants and existing plants in other countries to be the most largest tractor manufacturer in the world. Similarly Escort the second largest manufacturer in India has established assembly plants in the United States and Poland. And it is in the final stages of acquiring assembly units in Turkey and Ghana and has initiated two acquisitions in China. (Singh 2012).Secondly is China with 445,000 units. Both countries set new records for tractor demand, although growth rates in China slowed down compared to the enormous development over the past decade. The third country to reach a new peak in 2013 was Brazil, counting more than 65,000 tractors. Stronger trends also developed in North America, Turkey and Japan.(Anonymous 2015).

Conclusion

If Mexico wants to reduce poverty, migration and other social problems must initiate appropriate planning of increased production of domestically manufactured tractors, looking for the best strategy to achieve because the data do not lie, more tractors more GDP per capita By following the example of India, China, Turkey. It is necessary to continue this analysis because preliminary data confirm that there is a positive relationship between the number of tractors in a country and GDP per capita income.

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