

## The effects of tax incentives on job and income generation in the State of Maranhão

### Efectos de los incentivos fiscales en la generación de empleo e ingresos en el estado de Maranhão

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#### Abstract

This study aims to verify the participation of the tax incentive granted to companies in the growth of per capita income in Maranhão. The programs analyzed were: "PróMaralhão and "Mais Empresas" and the period verified was between 2010 and 2017. The methodology used was the analysis of data on the effects of tax incentives on the generation of employment and income from the Gross Domestic Product (GDP) production, per capita available on the websites: Instituto Maranhense de Socioeconomic and Cartographic Studies (IMESC), Brazilian Institute of Geography and Statistics (IBGE) and Institute of Applied Economics Research (IPEA). The main results are a positive relationship between the growth of employment and income in the state of Maranhão, and that the policy adopted by the government in the granting of tax incentives, through the PróMarlhões and Mais Empresas programs has contributed to economic growth, consequently, has generated some social and economic development for its citizens.

**Keywords:** economic growth, income, tax breaks, job creation.

#### Resumen

Este estudio tiene como objetivo verificar la participación del incentivo fiscal otorgado a las empresas en el crecimiento del ingreso per cápita de Maranhão. Los programas analizados fueron: "PróMaralhão y "Mais Empresas" y el período verificado fue entre 2010 y 2017. La metodología utilizada fue el análisis de datos sobre los efectos de los incentivos fiscales en la generación de empleo e ingresos del Producto Interno Bruto (PIB) producción per cápita disponible en los sitios web: Instituto Maranhense de Estudios Socioeconómicos y Cartográficos (IMESC), Instituto Brasileño de Geografía y Estadística (IBGE) e Instituto de Investigación de Economía Aplicada (IPEA). Los principales resultados son una relación positiva entre el crecimiento del empleo y los ingresos en el estado de Maranhão, y que la política adoptada por el gobierno en la concesión de PróMarlhões y Mais Empresas, ha contribuido al crecimiento económico, por lo tanto, ha generado algún desarrollo social y económico para sus ciudadanos.

**Palabras clave:** crecimiento económico, ingresos, incentivos fiscales, creación de empleo.

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## 1. Introduction

Maranhão is one of the states in the northeastern region and Brazil that has great needs and few social indicators that influence income and economic structure, aggravated by the deficient offer of public services (CARVALHO, 2015).

To get an idea of these social indicators, in 2018, the country had 13.5 million people with per capita monthly income below R \$ 145, or US \$ 1.9 per day, a criterion adopted by the World Bank to identify the condition of extreme poverty. This number is equivalent to the population of Bolivia, Belgium, Cuba, Greece and Portugal. Although the percentage remains stable in relation to 2017, it went from 5.8% in 2012 to 6.5% in 2018, a record in seven years. (IBGE, 2019).

Therefore, it is believed that, in some regions, due to the low rate of job creation, individuals have survived with a monthly income equivalent to R \$ 70 reais, because they are guaranteed by the federal government through the Bolsa Família program (BRAZIL, MDS, 2017). According to Braga and Oliveira (2019), if there were not the Bolsa Família Program, inequality in Maranhão would be worse, although there are some distortions in the execution of the program, it is evident that the resources transferred to the beneficiary families contribute to reduce the great inequality in the distribution of income in the state of Maranhão.

In this context, to combat regional inequality in the state, in 2010, the Maranhão government created the "PróMarhões" program with the objective of diversifying the industrial matrix, forming industrial densities in economic regions. However, in 2015, the state revoked the "pro-Maranhão" and created the "more companies" program in which it includes regions with a low Human Development Index (HDI) and which integrates productive chains essential to development and the generation of jobs and income in the state.

Thus, to guarantee the diversification of industry in the state, the government proposed a

reduction of up to 95% in the value of the tax on operations related to the circulation of goods and on the provision of interstate, intercity and communication services (ICMS) calculated monthly, according to Law No. 10,690, of September 26, 2017, which establishes a 20-year term for the concession, also including municipalities in the Integrated Development Network (RIDE), that is, metropolitan cities. It is understood that the ICMS reduction benefit may favor the metropolitan regions of Maranhão instead of other regions, including, investors can ignore the municipalities with low HDI due to the lack of infrastructure in the areas of basic sanitation, health, safety and labor.

Not always reducing a tax is a viable alternative to stimulate the economic development of a region. Reese (2005), states that, in the last two decades, academics and evaluators have made a series of recommendations to reformulate local economic development policies and at no time, recommended the use of tax cuts.

It can be seen that, in Maranhão, the reduction of taxes has come from tax incentives that, in some cases, have the purpose of generating jobs, income and fighting social inequalities, so the guiding question of this article is: is there a relationship between the companies that benefit from tax incentives with the growth of per capita income in Maranhão?. Thus, this study sought to find an answer to the question, in line with the thinking of Lynn (1980), in which he says that the fact that the State fosters fiscal incentive policies can produce specific effects for the development of the local industrial complex. For Peters (1986), whether by promoting economic growth or developing tax incentives, directly affect the lives of citizens.

Therefore, the general objective of this study was to verify the participation of the tax incentive granted to companies in the growth of the per capita income of Maranhão, between 2010 and 2017. The specific objectives were to identify, through correction, the impact of companies that receive tax incentives in Maranhão in the Brazilian Gross Domestic Product (GDP); identify

the relationship between the perspective of production and the sector benefited by the "PróMarhães" and "More Companies" tax incentives in Maranhão; and verify the relationship between the "Pro-maranhão" and "More Companies" tax incentives granted to companies with GDP per capita in Maranhão.

## 2. Theoretical framework and methods

### 2.1 Economic development

It is noticed that, over the years, several discussion forums on regional development have discussed the way in which States have granted tax incentives. It is believed that the tendency is to deepen this discussion in the academic environment, when such incentives are intended to stimulate the generation of jobs and income. Considering that the most recent data show that, despite some indications of a more favorable recent dynamic (with job creation despite the bad indicators of economic activity), the Brazilian labor market remains quite deteriorated, permeated by high numbers of unemployed, discouraged and under-occupied.

With regard to unemployment, it should be noted that the number of unemployed people who have been in this situation for more than two years has been growing. If, in the first quarter of 2015, 17.4% of the unemployed were in this situation, in the same period of 2019, this percentage increased to 24.8%, which corresponds to 3.3 million people. In the case of younger workers, this result corroborates an even more adverse employment scenario, which combines high unemployment (27.3%), low job growth (0.4%) and a drop in real income (-0.8%). (IPEA, 2019).

There is a conception that there is a dilemma between the granting of tax incentives and the generation of jobs in Brazil, that directly or indirectly affect the country's regional development, which researchers try to understand from social actors such as companies, governments and employees.

It is known that the economic crisis that Brazil is going through has been an impasse to favor the increase of unemployment and, in part, it led the population to oppose informal work, since the National Household Sample Survey (PNAD) showed that, although the increase in occupation still occurs, mainly in the informal market (workers without a formal contract and self-employed). There was an expansion of 1.5% of the contingent of formal workers in the private sector, a result that becomes the best since the mobile quarter ended in November 2014 (IPEA, 2019).

Based on the above, it is understood that the granting of tax incentives to companies involves not only the generation of jobs and income, but also economic development as a whole, because, for Furtado (2009), economic development is a phenomenon with a clear historical dimension. Each developing economy faces a number of specific problems, although many are common to other contemporary economies. The complex of natural resources, the migratory currents, the institutional order and the relative degree of development of contemporary economies, make each historical phenomenon of development unique.

In view of this historical dimension mentioned by Furtado, this study sought to limit its analysis to the Maranhão region; since, according to the Technical Office of Studies of the Northeast (ETENE), Maranhão has the fourth largest GDP in the Northeast, that is, R \$ 89.52 billion in 2017, which corresponds to 1.3% of the total Brazilian economy (R \$ 7.3 trillion in 2017) and 9.2% of the total economy of the Northeast (R \$ 953.2 billion in 2017) (IPEA, 2019).

As explained, Maranhão is believed to be an object of study of great relevance, since, based on the strategic prospective analysis, information will be provided on the granting of tax incentives to industries and agro-industries that can assist the state government and other units of the Brazilian federation.

## 2.2 The theory of tax incentives

It is noticed that the theories of tax incentives follow a line, that for years state governors have offered tax breaks as a way to stimulate job creation. They are defined as such by company-specific tax cuts, which generally play a significant role in attracting companies to locations (Glaeser, 2001).

In this way, companies play an important role in the well-being of citizens, as it is based on this that the State builds social and economic policies. However, the economic policies that result in the creation of tax incentives do not necessarily translate into greater social welfare, because the region may be interested in attracting companies for reasons other than employment (Garcia-Mila & Mcguire, 2001).

Theoretically, there is a conception that there is an interest, in part, of politicians to promote themselves politically, and this is one of the reasons that lead to the creation of tax incentives, with the argument that it is necessary to attract companies that generate jobs, but that, theoretically, these political interests end up generating tax competition and, at the same time, public services are inefficiently low in many places (Oates, 1972; Zodrow And Mieszkowski, 1986; Wilson, 1986; Wildasin, 1989). In theory, several regions offer tax incentives and that, for national and international companies to establish themselves in these regions, the State concerned must offer a greater tax reduction than other states, which is called tax competition between regions.

For Oates (1972), tax competition is designed to attract companies, seeks to maximize profits, freely choose locations and lead local authorities to reduce taxes on capital, in which, when deciding the level of public goods to be financed by taxes, States take into account the cost of losing potential companies. However, states' attention to not losing big investors is going in the wrong direction as distortions of competition increase (Garcia-Mila & Mcguire, 2001).

These theories demonstrate that there are distortions in fiscal incentive policies in several regions, because, when they occur, they move the economy away from efficient allocation or worsen an already inefficient result (Black & Hoyt, 1989).

Regarding the tax incentive, when efficient, to the point of developing the place, Garcia-Mila y Mcguire (2001), defend the possibility that the new capital investment will bring benefits to the community, in addition to the increase in production and wages associated with the new capital, as these benefits are concentration externalities, a form of agglomeration economy associated with increased capital investment. For this, Garcia-Mila & Mcguire (2001) present a model for reducing taxes on capital below the level of tax on benefits, that induces companies to make excellent decisions that result in an efficient allocation of public and private resources.

In this model of tax reduction, Garcia-Mila & Mcguire (2001) present a typical example of investment in private capital, showing that when a company buys better machines for its workers, it increases productivity and, in this case, instead of the states subsidize companies through tax incentives, they can choose to subsidize highly qualified labor (Garcia-Mila & Mcguire, 2001).

However, according to Weber (1929), not only should the tax incentive be taken into account when establishing the most suitable location for industries, it should, therefore, take into account the cost of transportation, labor, availability of raw materials and agglomerative forces, that is, forces that induce industry to concentrate on a particular region.

## 2.3 Methodological procedures

This research was based on Vergara's taxonomy (2016), and is for descriptive, explanatory and applied purposes. Descriptive because it sought to characterize the tax incentives destined for the regions of the state and their relationship with the per capita income of the State and Brazil. Explanatory because it aims to clarify the factors that contribute to the development of Maranhão,

specifically, in the poorest regions, as well as to clarify the reasons that lead to the increase in social inequalities.

The research is applied, because this study sought to solve concrete problems associated with poverty and social inequality in the region. In Maranhão, the Bolsa Família program covers all 217 municipalities. The State is the owner of the largest number of people covered by the Program in relation to its global population. According to the Ministry of Social Development and Fight against Hunger - MDS, 3,106,283 Maranhão are currently receiving benefits. The Bolsa Família Program (PBF) benefited 937,190 families in May 2013. Families receive benefits with an average amount of R \$ 174.10 and the total amount transferred by the federal government in benefits to families served reached R \$ 163,160,748 in the month. (Piedade and Moreira, (2014).

Therefore, the methodological procedures of this study were structured in 3 stages: selection of the object of study, data collection, and data analysis and interpretation.

#### *Selection of the study object*

For this purpose, the industrial and agro-industrial companies of the State of Maranhão were selected as the object of study, which benefited from the tax incentives "PróMaranhão" and "Mais Empresas", between the years 2010 and 2017.

#### *Data collect*

In this case, data collection occurred in two ways. First, the Secretariat for Industry, Commerce and Energy (SEINC) was asked to request information on the number of companies that benefit from the "PróMaranhão" and "Mais Empresas" tax incentives. These data were transformed into variables called Apportionment of the number of companies that receive the tax incentives "Pro-maranhão" and "Mais Empresas".

Second, information on the Gross Domestic Product (GDP), was extracted from the websites: Instituto Maranhense de Socioeconomic and Cartographic Studies (IMESC), Brazilian Institute of Geography and Statistics (IBGE) and Institute of Applied Economic Research (IPEA) and transformed into variables.

#### *Data analysis and interpretation*

The data obtained after the conclusion of the bibliographic research were analyzed and compared using basic statistics. As for the state's per capita income, we sought to analyze the data using Pearson's coefficient. Pearson's and Stanton's (2001), says: "correlation coefficient is a measure of bivariate association (strength) of the degree of relationship between two variables". For Moore (2007), "the correlation measures the direction and degree of the linear relationship between two quantitative variables".

According to Figueiredo Filho and Silva Júnior (2009), "Pearson's correlation coefficient ( $r$ ), is a measure of linear association between variables". For Figueiredo Filho and Silva Júnior (2009), "the Pearson ( $r$ ) correlation case is valid for this last parameter, that is, it is a measure of the shared variance between two variables". On the other hand, the linear model assumes that the increase or decrease of a unit in variable  $X$ , generates the same impact in  $Y$ . In graphical terms, linear relationship means that the best way to illustrate the relationship pattern between two variables is through a straight line. Therefore, Pearson's correlation ( $r$ ) requires a share of variance and that this variation be distributed linearly (Figueiredo Filho and Silva Júnior, 2009).

According to Figueiredo Filho and Silva Júnior (2009, p. 119), the Pearson correlation coefficient ( $r$ ) varies from -1 to 1. In the Pearson correlation coefficient, the values can indicate positive or negative direction of the relationship and even show strength of the relationship between the variables, therefore, a correlation to make perfect (-1 or 1) must necessarily be exact, as well, if the

value of a correlation is zero it indicates that there is no linear relationship between the variables.

However, extreme values (0 or 1) are hardly found in practice, so it is important to discuss how researchers can interpret the magnitude of the coefficients (Figueiredo Filho and Silva Júnior, 2009). For this reason, Cohen (1988) says that values between 0.10 and 0.29 can be considered small; scores between 0.30 and 0.49 can be considered as average; and values between 0.50 and 1 can be interpreted as large. For Dancey and Reidy (2006), the classification is slightly different:  $r = 0.10$  to  $0.30$  (weak);  $r = 0.40$  to  $0.6$  (moderate);  $r = 0.70$  to  $1$  (strong).

Therefore, it is known that the closer to 1, the greater the degree of linear statistical dependen-

ce between variables, otherwise, the closer to zero, the lower the strength of this relationship. The data for the construction of the coefficient of variation ( $V_w$ ) were taken from the portals mentioned in the first paragraphs of the topic methodological procedures.

### 3. Results and discussion

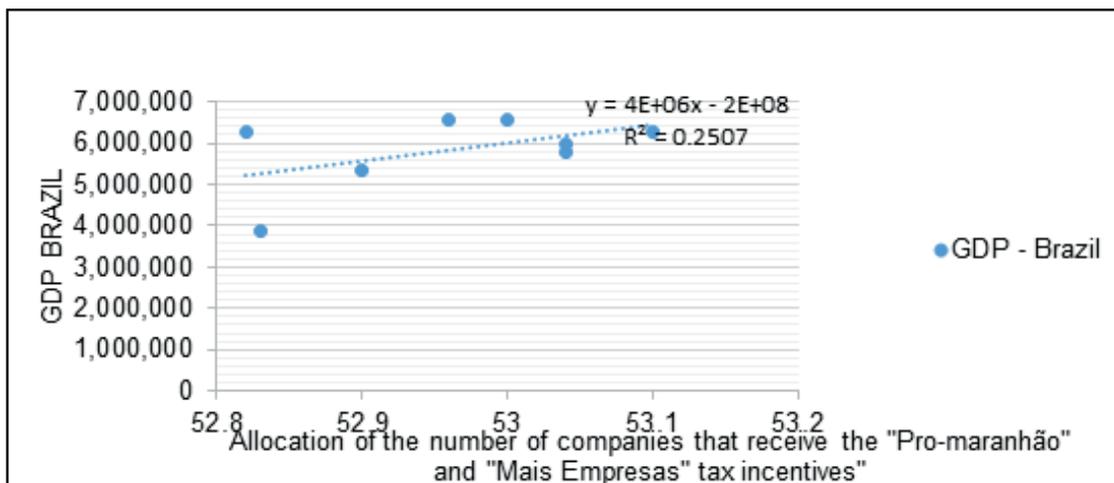
To understand the effects of tax incentives on Maranhão's income, this study begins by analyzing the correlation between the variables "Apportioning the number of companies that receive the PróMarhães tax incentives" and Mais Empresas "and" Gross Domestic Product (GDP) of Brazil, "between 2010 and 2017, as shown in table 1.

**Table 1.** Variables the number of companies that receive the "PróMarhães" and "More companies" and Brazilian GDP (R \$ Billion) tax incentives in terms of production between 2010 and 2017 (IBGE, 2017; Imesc / MA, 2019).

	Apportionment of the number of companies that receive the "PróMaranhão" and "More companies" tax incentives	PIB - Brazil
<b>2010</b>	52,83	3.885.847
<b>2011</b>	52,9	5.331.619
<b>2012</b>	52,82	6.269.328
<b>2013</b>	52,96	6.583.319
<b>2014</b>	53,04	5.778.953
<b>2015</b>	53,04	5.995.787
<b>2016</b>	53,1	6.269.328
<b>2017</b>	53	6.583.319
<b>R = 0,500674</b>		

As shown in table 1, there is a moderate positive linear correlation between the variables, since  $r = 0.50$ , that is, 50%. Which, on the other hand, the linear model assumes that the increase or decrease in the number of companies who receive the tax incentives "PrMaralhão" and "Mais

Empresas", generate the same impact in terms of Brazil's GDP (Figueiredo Filho and Silva Júnior, 2009). For a better understanding, see the illustration of the relationship between these variables in figure 1.



**Figure 1.** Linear correlation between the number of companies that receive the “Pro-maranhão” and “Mais Empresas” tax incentives and Brazil’s GDP from the perspective of production in Maranhão, between 2010 and 2017.

However, this linear correction, considered moderate, is not confirmed when figure 1 shows that

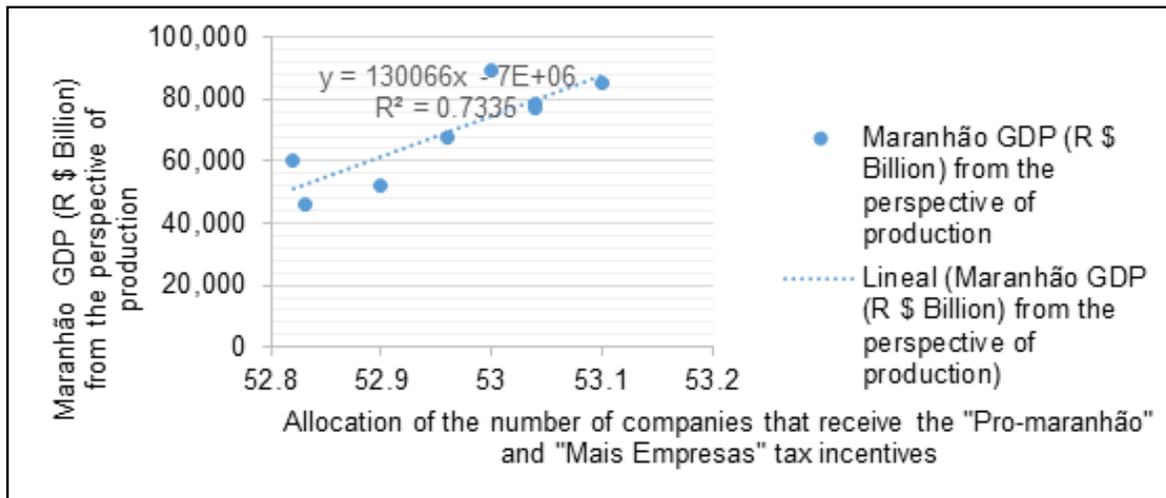
$R^2 = 0.25$ , revealing a small relationship between the variables analyzed.

**Table 2.** Variables the number of companies that receive the tax incentives “Pro-maranhão” and “Mais Empresas” and the GDP of Maranhão (R \$ Billion) in terms of production between 2010 and 2017 (IBGE, 2017; Imesc / MA, 2019).

	Allocation of the number of companies that receive the “Pro-maranhão” and “Mais Empresas” tax incentives	Maranhão GDP (R \$ Billion) in terms of production
<b>2010</b>	52,83	46.310
<b>2011</b>	52,9	52.144
<b>2012</b>	52,82	60.490
<b>2013</b>	52,96	67.695
<b>2014</b>	53,04	76.842
<b>2015</b>	53,04	78.476
<b>2016</b>	53,1	85.310
<b>2017</b>	53	89.524
<b>R = 0,856439</b>		

Note that when calculating the samples contained in table 2 in a regionalized way, it is noticed that the level of correlation between the variables analyzed is:  $r = 0.85$ , that is, 85%,

demonstrating the possibility of a strong positive correlation between the companies that receive tax incentives with Maranhão’s GDP in terms of production.



**Figure 2.** Linear correlation between the number of companies that receive the tax incentives “Pro-maranhão” and “Mais Empresas” and the GDP of Maranhão (r \$ Billion) from the perspective of production in Maranhão, between 2010 and 2017.

Figure 2 shows a slight decrease in the percentage of correlation from 85% to 73%, even so, it indicates that there is a strong linear relationship between the variables analyzed, since  $R^2 = 0.73$ ,

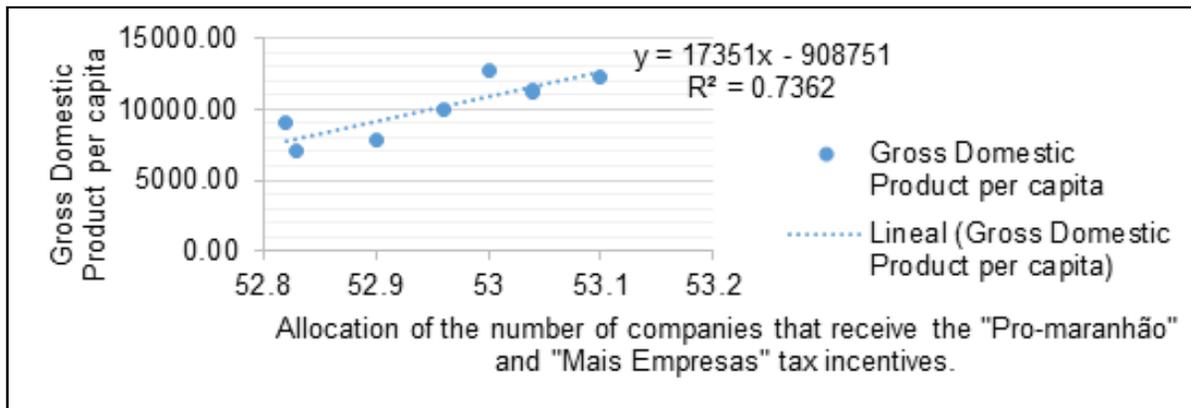
that is, 73%; because, for Dancey and Reidy (2006), a slightly different classification, where  $r$  is between 0.70 to 1 means that there is a strong correlation between two variables.

**Table 3.** Variables apportioned to the number of companies that receive the tax incentives “Pro-maranhão” and “Mais Empresas” and GDP Per Capita in Maranhão, between 2010 and 2017 (IBGE, 2017; Imesc / MA, 2019).

	Allocation of the number of companies that receive the “Pro-maranhão” and “Mais Empresas” tax incentives	Gross Domestic Product Per Capita
<b>2010</b>	52,83	7049,60
<b>2011</b>	52,9	7850,48
<b>2012</b>	52,82	9005,51
<b>2013</b>	52,96	9963,50
<b>2014</b>	53,04	11216,40
<b>2015</b>	53,04	11366,2
<b>2016</b>	53,1	12267,70
<b>2017</b>	53	12788,80
<b>R = 0,86</b>		

In terms of income, it is observed that, when calculating the samples in table 3, the level of correlation between the variables analyzed is:  $n = 0.86$ , that is, 86%, demonstrating the possibility of a strong positive correlation between the number of companies that receive the tax

incentives “Pro-maranhão” and “Mais Empresas” and GDP per capita, in Maranhão. However, to test the hypothesis that there is a strong positive linear correlation between the variables, as shown in Table 3, the  $R^2$  value was calculated, in which 0.73 were found, that is, 73%.



**Figure 3.** Linear correlation between the number of companies that receive the "Pro-maranhão" and "More companies" tax incentives and GDP Per Capita in Maranhão, between 2010 and 2017.

In figure 3, it can be seen that there is a strong relationship between the jobs generated in Maranhão through industries with GDP per capita of the State, which justifies the creation of fiscal incentives for the industrial and agroindustrial sectors of the region; because, according to Veríssimo and Saiani (2019), industrial participation plays an important role in the economic growth of municipalities with lower levels of average GDP per capita. According to Kaldor (1966), the industry has characteristics capable of stimulating economic growth on the demand side, led by exports, mainly of manufactured products.

Based on the above, it is believed that fiscal incentives may positively influence the growth of employment and income in Maranhão. This, because in the study by Veríssimo and Saiani (2019), by ranges of average GDP per capita, it was indicated that there are positive effects average industrial participation, growth is relatively higher in "low GDP" municipalities. Which indicates that the advance of industrialization in them may be related to the impacts of productivity gains, resulting from the transfer of resources from agriculture to industry, with multiplier effects of products due to: economies of scale, learning gains and productive and technological repercussions of industrial activity in other sectors.

#### 4. Conclusions

This study ends with a conception that the state of Maranhão has serious social problems, such as: extreme poverty and low education, which has persisted for many years, is not only worse due to the Income Distribution Program via Bolsa Família. However, the state government has been implementing actions of tax incentive policies for local companies. This analysis contributes to the debate on economic growth. Thus, this article analyzed the granting of tax incentives through the Pro-Maranhão and Mais Empresas programs, between 2010 and 2017.

The "Mais Empresas" industrial development and economic integration program, aims to foster and diversify industry and agribusiness in the state, developing industrial centers and strengthening local production chains, increasing production, expanding and attracting new businesses, through granting tax incentives, presumed credit on the value of ICMS. As for the results, there is a moderate positive linear correlation between the variables, as it has been proven that 50% presupposes an increase or reduction in the number of companies that received tax incentives, generated the same impact on the Brazilian GDP, also presupposes a moderate contribution to income by companies that received incentives in Maranhão. When the

analysis is regionalized, the performance was better, reaching 85%, of correlation between the GDP of the State with the companies encouraged. There was also a strong correlation, 86%, between companies and per capita income in Maranhão, that is, an increase in the tax incentive tends to generate a positive effect of up to 86% on personal income.

Finally, this study sought to discover whether the tax incentives granted to companies have a certain effect on income growth in Maranhão and it can be concluded that this effect exists, because the sectors of the economy that benefit from these incentives have the capacity to generate a quantity of employment and income in a way that directly reflects GDP and income per capita.

Thus, the study ends by showing that there is a certain power of influence in companies that receive tax incentives in Maranhão, when the variable number of companies that benefited from the programs: “PróMarhães” and “Mais Empresas”, was compared with the Brazilian GDP in terms of production.

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