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IPI reduction and reflexes in publics finances of Minas Gerais municipalities

Redução do IPI e os reflexos nas finanças públicas dos municípios de Minas Gerais

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Resumo

As desonerações do Imposto sobre Produtos Industrializados (IPI), implementadas pela União para contornar os efeitos negativos da crise financeira mundial, influenciaram significativamente a composição do Fundo de Participação dos Municípios (FPM), principal fonte de financiamento das finanças públicas municipais. Dessa forma, este estudo teve como objetivo verificar se as receitas dos municípios de Minas Gerais e seus indicadores socioeconômicos sofreram alterações significativas após a renúncia fiscal do IPI praticada pelo governo federal a partir de 2008. Os resultados evidenciam que os municípios de pequeno porte foram os que mais sofreram os efeitos negativos da redução do IPI sobre o FPM. Por outro lado, identificou-se também que para mais de 50% dos municípios analisados houve um aumento nos níveis da arrecadação tributária e também nos valores transferidos a título do FPM, em virtude do apoio financeiro concedido pela União.
Palavras-chave: IPI. Desoneração. FPM.

Abstract

The IPI tax exemptions implemented by the Union to circumvent the negative effects of the global financial crisis significantly influenced the composition of the Municipal Participation Fund (FPM), the main source of financing of municipal public finances. Thus, this study aimed to verify whether the revenues of the municipalities of Minas Gerais and their socioeconomic indicators changed significantly after the federal government's IPI tax waiver from 2008. The results show that the small municipalities were the ones that suffered the most negative effects of the IPI reduction on the FPM. On the other hand, it was also found that for more than 50% of the municipalities analyzed there was an increase in the levels of tax collection and the amounts transferred under the FPM, due to the financial support granted by the Union.
Keywords: IPI.Tax Relief. FPM.

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INTRODUCTION

The fiscal decentralization impelled after the Federal Constitution of 1988 (FC/88) raised Brazilian municipalities to the condition of federative beings, holding, henceforth, administrative, political and financial autonomy. This autonomy implied tax expansion revenue, enabling the collection of their own revenue from the exploitation of the local tax base, and through transferring responsibilities and attributions of the Union to the municipalities. According to Brunozzi Junior *et al* (2011), municipalities had their competences and attributions expanded, starting to intervene in several issues, such as deliberating on matters that were previously restricted to the competence of the central government. However, the small revenue potential challenged this financial autonomy and the social and fiscal responsibility of the municipal governments.

The revenue potential of municipalities is a reflection of the regional imbalances existing in the country, reflecting in the different levels of socioeconomic development (VIEIRA *et al*., 2017). In order to minimize socioeconomic disparities, the federal government started to intervene in municipal public finances through intergovernmental transfers. These transfers are instruments of equalization inherent to the federalism adopted in the country, and consist of the division of the tax revenue, in which a certain federal entity collects the taxes and passes them on to the federated entities, with the resources percentage being established, through the Constitution, every fiscal year (GALVARRO *et al*., 2009). Currently, the main intergovernmental transference from the Union to municipal governments is the Municipal Participation Fund (FPM).

The FPM is the transfer of revenue from the Union to the municipalities in order to redistribute public resources, based on populational criterion (number of inhabitants), attempting to mitigate the existing inequalities between them. Several criticisms rise from this type of redistribution. According to Moraes (2006), this intergovernmental transference, rather than reducing inequality between municipalities, causes small municipalities to become highly dependent, not striving to collect taxes within their own competence. Even so, the relevance of this redistribution is noticeable when it comes to socioeconomic development, as it aims to adjust the financial imbalance, finance social projects nationwide and reduce the differences between the federated units of the same level of government.

Currently, the FPM is composed of 24.5% of the Tax on Industrialized Products (IPI) and the Income Tax (IR). This means that any IPI or IR tax waiver measure adopted by the federal government “has a direct impact on the Union's transfers to municipalities, which may imply budgetary imbalance” (OLIVEIRA; PINTO; SANTA RITA, 2017, p. 1). In addition, as FPM is the main source of revenue for Brazilian municipalities (SOUSA; ARANTES, 2012; FERREIRA, 2014; MASSARDI; ABRANTES, 2015; 2016; PASSOS; NASCIMENTO, 2018), especially small and low-level economic activity ones, the impact of the IPI waiver on FPM may also reflect on the socioeconomic development of these locations, which depend almost exclusively on the allocation of resources in public policies aimed at this end.

Competent to the Union, IPI has been constantly used by the Brazilian government as an economic policy tool, due to its extra-fiscal nature and the significant growth in its collection (OLIVEIRA; PINTO; SANTA RITA, 2017). Data from the Brazilian Federal Revenue Service (RECEITA FEDERAL, 2018) indicate that the revenue of IPI reached the levels of $ 49.131 billions in 2017, with a growth of more than BRL 1.982 billions compared to 2016, thus evidencing the magnitude collection of this tax for public internal revenue. Therefore, the reduction of the IPI rate, and even its exemption in specific sectors as an alternative to boost the economy, can cause this type of relief to have direct effects on the finances of states and municipalities (MUCCI *et al*., 2016; OLIVEIRA; PINTO; SANTA RITA, 2017).

The global financial crisis, which started in 2007 and whose reflexes reached countries all over the world in 2008, including those in development, caused the Brazilian government to establish measures to face an economic slowdown (FERRAZ, 2013). In order to do so, as a measure of tax concession, the federal government has interfered with some economic sectors reducing IPI rates, aiming at recovering the economy (ARAÚJO; GENTIL, 2010), avoiding the fall on the consumption of industrialized products and stimulating investments and employment in the country (ABRANTES *et al*, 2017).

Since then, several researches have reported the reflection of these measures in the Brazilian economy. Most studies treat the reduction of the IPI rates for some sectors, such as automobiles (ABRANTES *et al*., 2017; WILBERT *et al*, 2014), mining and the steel industry (BRAGA; ABRANTES; FERREIRA, 2010), construction (SERRANO *et al*., 2018), among others. These studies' results showed impacts for the country's economy as a whole, from the analysis of a specific sector. However, the IPI exemptions considerably affected the public finance of Brazilian municipalities. A survey made by the National Confederation of Municipalities (CNM), has revealed that the IPI and IR exemptions granted in 2008 are BRL 518 billions from 2008 to 2014, overtaxing the municipalities' FPM on more than BRL 122.7 billions (CNM, 2016). This way, any variation on the FPM may directly affect the execution of public policies and the budgetary balance, as it represents 70% of municipal revenue and, for this reason, it is the main transference from the Union to municipalities (SOUSA; ARANTES, 2012).

Due to the importance of the IPI on composing the FPM, and considering how dependent the municipalities are on this resource, this study intends to answer the following research question: Did the public finance of municipalities significantly change after the IPI exemption? The study's general objective is to analyze the performance of municipal public finance from the IPI tax exemptions, specifically the FMP, since it is the main source of resources in Brazilian municipalities. Additionally, it aims at comprehending whether the tax exemption has also reflected on socioeconomic development, as literature has been indicating that FMP is an important tool for promoting the socioeconomic development of the municipality (VIEIRA *et al*, 2017).

The state of Minas Gerais was chosen because it is the Brazilian state with most municipalities, (a total of 853) in a context of severe regional disparities, having stagnant and dynamic regions coexisting in the same space (MASSARDI; ABRANTES, 2015). In addition, as it is composed of many small municipalities, Minas Gerais receives higher resources than it would receive, if the strict distribution criterion of the FPM was adopted, that is, the level of economic and income development *per capita* compared to the populational criterion (PRADO, 2007).

The present paper is organized in five sections; the introduction being the first one. The second section introduces the Theoretical Framework divided into two topics: Municipal Public Finance and the socioeconomic Development; IPI exemption and the Participation Fund of Municipalities (FPM). The objective of this section is to identify the composition of the FPM and also its participation in public finance of municipalities in relation to the municipal socioeconomic development. The third section accounts for the methodology adopted to reach the study's general objective. The fourth section brings the reached findings and the conducted discussions. The last section contains the final considerations of the study and further research suggestions.

THEORETICAL FRAMEWORK

Municipal Public Finance and the Socioeconomic Development

Public finance corresponds to the procurement, distribution, use and control of financial resources (MATIAS-PEREIRA, 2012). In Brazil, they are mainly oriented by the Federal Constitution of 1988 (CF/88), by the Budget Law (Law no 4.320/64) and by the Complementary Law no 101/2000, hereon Fiscal Responsibility Law (LRF), which establishes the guidelines for performance of all federative agents, specially concerning the development and control of public budget.

In the municipal context, public revenue can be a result of the exploration of tax base, through the revenue of taxes of their own competence or from intergovernmental transferences (REZENDE, 2001). With the Federal Constitution of 1988, several tax competences were transferred to municipalities, as it is the case of the revenue of the Imposto Predial Territorial Urbano - IPTU (property tax), Imposto sobre serviços de qualquer natureza - ISS (tax over services of any nature), Imposto sobre a Transmissão de Bens Imóveis - ITBI (property tax), as well as charges and improvement contributions (BRASIL, 1988). As it depends on the economic and demographic characteristics of the municipalities, such as *per capita* income, level of urbanization, population size and sectorial composition of production (RODRIGUES, 2004; CAMPELO, 2003), tax revenue varies between Brazilian municipalities, causing inequalities in terms of capacity and fiscal needs.

Regarding intergovernmental transferences, the most important are transferences from the Union, such as the Imposto Territorial Rural - ITR (Rural Territorial Tax) quota, Imposto sobre Operações Financeiras - IOF-Ouro (Financial Operations Tax) quota, Contribuição de Intervenção no domínio Econômico - CIDE-fuels- (Intervention Contribution in the economic domain), Fundo de Participação dos Municípios - FPM (Municipality Participation Fund), in addition to those corresponding to resources linked to specific areas, such as transfers from the Fundo Nacional de Desenvolvimento e Manutenção da Educação Básica - FUNDEB (National Fund for the Development and Maintenance of Elementary and the Sistema Único de Saúde - SUS (Unified Health System), among others (MENDES; MIRANDA; COSSIO, 2008). Concerning transferences of origin from the states, the share of the Tax on Circulation of Goods and Services (ICMS) and the Tax on Property of Motor Vehicles (IPVA), are the most significant in the budgets of the municipalities, whose volume of resources transferred varies according to the Brazilian states.

In addition to complementing municipal revenue, transfers are important instruments for reducing regional inequalities (MENDES; MIRANDA; COSSIO, 2008; BAIÃO; CUNHA; SOUZA, 2017), especially the FPM, which, as a mandatory transfer, expands autonomy of the receiving government, which, then, is able invest the resources in areas that require greater investments.

Current FPM distribution criteria use the population and income factor *per capita* for the capitals of each state, and population ranges for inner state municipalities Such criteria do not require efforts by the municipalities to receive the resources from the respective fund, causing tax revenue inefficiency revenue (ORAIR; ALENCAR, 2010) and, therefore, high levels of financial dependence (SOUSA; ARANTES, 2012; MASSARDI; ABRANTES, 2015; 2016; PASSOS; NASCIMENTO, 2018).

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Massardi and Abrantes (2015) identified that the small municipalities of Minas Gerais were highly dependent on the FPM, and for some municipalities the dependence on this transfer represented on average 75.2% of the total current revenue for the analyzed period. These results were corroborated by Passos and Nascimento (2018), who found a strong dependence on the FPM for municipalities in the state of Piauí. Thus, the FPM is fundamental for municipal public finances, especially for small municipalities, which, due to low exploitation of their tax base, depend on this resource to finance public services.

Concerning the reduction of regional inequalities and the promotion of socioeconomic development, research has sought to understand the role of public finance management in achieving this purpose. Massardi and Abrantes (2015) studied the municipalities of Minas Gerais and observed that a large part of the municipalities presented a low level of fiscal effort (revenue) and a high level of dependence on the FPM. Additionally, when correlating the level of dependence of the FPM with the fiscal effort index and with the socioeconomic development, measured by the IFDM, they verified a negative correlation; on the other hand, the fiscal effort index showed a positive correlation with the IFDM. This result was corroborated by Vieira *et al* (2017), who found that the municipalities with the greatest collection effort showed higher levels of socioeconomic development.

IPI Tax exemptions and the Participation Fund of Municipalities

The IPI originated from the former Consumption Tax of 1934, was instituted by Constitutional Amendment nº 18, of December 1, 1965 and its competence belongs to the Union and it is expressed in the current Federal Constitution (CF / 1988) and in the National Tax Code (Law 5.172 / 66). According to the constitutional text, the IPI "is a non-cumulative tax that affects consumption, being selective according to the essentiality of the good and whose value is passed on to the final consumer" (BRASIL, 1988). These characteristics allow different rates according to the product, that is, a higher or lower rate that may vary over time, and that converge to the interests of the fiscal policies that governments want to implement (ABRANTES *et al*, 2017).

Although it has fiscal characteristics, that is, a fund-raising function for public coffers, the IPI is essentially extra-fiscal, as it aims to interfere in the economic sphere, remaining as a means to achieve the ends of the current fiscal policy (ABRANTES *et al*, 2017; OLIVEIRA; PINTO; SANTA RITA, 2017). "Extrafiscality does not necessarily mean that the State will stop collecting resources with taxes coming from this tax function" (ABRANTES *et al*, 2017, p. 55). The difference is characterized by the purpose of the tax, which, in this case, is not exclusively collected, even though it provides the inflow of funds to public finances (ABRANTES *et al*, 2017). Thus, the IPI is used as an instrument of state intervention in the economic and social spheres.

Serrano *et al* (2018) recommend that the flexibility in the application of IPI legitimizes its use for regulatory purposes, whose objective is to intervene in the economy. This intervention can be "encouraging or discouraging of certain operations or activities, by means of greater or lesser taxation on them" (ALEXANDRINO; PAULO, 2002, p. 63).

Due to the characteristics of an extra fiscality, the IPI reduction was used as a regulatory measure for the 2008 crisis, which has drastically reverberated in Brazil. Some measures of exemption of this tax were taken, such as the ones in Ordinances 6.687/2008, 6.743/2009, 6.825/2009, 6.890/2009, 7.394/2010, 7.57/2011, 7.660/2011[4] and 7.725/2012 that initially benefited the automobile sector and after the construction supplies, basic appliances and furniture sectors (MARTINS, 2014; ABRANTES *et al*., 2017). It is estimated that up to date the repercussions of such measures reflect on the public internal revenue, once the Union did not raise BRL 6.1 billions related to IPI exemption on the automotive sector (MARTINS, 2014).

It is evident that the exemptions adopted by the Brazilian federal government have directly impacted the economy of the country. Abrantes *et al*. (2017) have shown that the reduction in the payment of IPI in the tax exemption periods has negatively influenced the turnover of companies in the automotive sector. Therefore, results suggesting that "individual tax changes arising from fiscal policies, in this case, the exemption from IPI, was not effective overall for the increase in gross sales revenue of companies in the Vehicles and Parts and correlates" (ABRANTES *et al*., 2017, p. 66). On the other hand, Serrano *et al*. (2018) have found a positive relationship between the reduction in the IPI and the increase in gross revenue in the construction sector.

In addition to the impacts on the productive sectors, the data showed that the tax waiver granted from 2008 onwards related to the IPI had a direct impact on the distribution of tax revenue, particularly on transfers from the Participation Funds of States (FPE) and Municipalities (FPM), which are constituted by the resources from the collection of IPI and IR.

A survey made by the National Confederation of Municipalities (CNM), based on the methodology of the Federal Court of Accounts (TCU - Brazil), has estimated that the tax waivers of IPI and IR are more than BRL 516 billions from 2008 to 2014, having a negative impact on the FPM transfer of BRL 122,7 billions, being the southeast the region with the most negative impact coming from the transfers result to IR and IPI exemptions (CNM, 2016).

Mucci *et al* (2016) have found that despite the improvements of an economic nature, the exemption from the IPI has impacted the formation of the FPE, compromising its main function, which is to promote socioeconomic balance and alleviate regional inequalities through the development of the poorest states of Brazil (MUCCI *et al*., 2016). Oliveira, Pinto and Santa Rita (2017) identified that the IPI exemptions granted by the central government to some productive sectors did not compromise the public finances of municipalities of the state of Alagoas, nor did they indicate a significant imbalance to compromise the financial autonomy of the municipalities or the continuity of current public policies. This is due to the fact that the reduction in FPM resources, caused by exemptions from the IPI, was stabilized by the increase observed in the collections of ISS and IPTU (OLIVEIRA; PINTO; SANTA RITA, 2017). Thus, the magnitude of the impact of the exemption from the IPI tax on municipal public finances is also conditioned by the revenue capacity of Brazilian municipalities.

METHODOLOGY

In this study, a descriptive research was carried out, with a quantitative approach, given that statistical techniques were used to analyze whether municipal public finances, especially the FPM, underwent significant changes with the exemption from IPI.

The analysis universes are the municipalities of Minas Gerais state. The state is nationally recognized as the third biggest participation in the Brazilian PIB, BRL 598,5 billions in 2018, only behind São Paulo and Rio de Janeiro states. Thus, in addition to economic representativeness vis-à-vis other Brazilian federative entities, the state of Minas Gerais is also identified

[4] Revoked by Ordinance no 8.950, from 2016.

as the Brazilian state with the largest number of municipalities with 853 municipalities, 15.5% of the country's total, the majority of which are small. Also noteworthy is the fact that the state is located in the Southeast region, which suffered the greatest negative impacts from the reduction of FPM transfers due to the exemptions from the IPI, accounting for 48.7% of the total waivers from 2008 to 2014 (CNM, 2016).

Given the unavailability of some data for some municipalities over the analyzed years, the final sample of this study is composed of 565 municipalities, representing, therefore, 66.20% of the total municipalities in Minas Gerais.

The data was obtained from official government sources, such as the Brazilian Public Sector Tax and Accounting Information System (SICONFI), available on the National Treasury website and the Firjan Institute (FIRJAN). The variables selected to represent municipal public finances, as well as variables related to socioeconomic development, are shown in Table 1 below, accompanied by the respective sources.

Table 1 - Variables used in the study

Initials	Variable	Description	Source
RC	Current Revenue	It represents the sum of resources available to the municipalities (own collections and transferences).	SICONFI
IPTU	Imposto Predial Territorial Urbano	It represents the valued collected by the municipality for the Imposto Predial Territorial Urbano	SICONFI
ITBI	Imposto sobre a Transmissão de Bens Imóveis	It represents the value collected by the municipality for the Imposto sobre a Transmissão de Bens Imóveis.	SICONFI
ISS	Tax on services of any stripe	It represents the value collected by the municipality for the Imposto sobre a Transmissão de Bens Imóveis.	SICONFI
TX	Charges	It represents the value collected by the municipality through charges.	SICONFI
CM	Improvement Contribution	It represents the value collected by the municipality for Improvement Contribution.	SICONFI
FPM	FPM Portion	It represents the Participation Fund of Municipalities	SICONFI
DC	Current Expense	It represents the sum of current expenses of the municipality	SICONFI
FPM Dep	FPM Dependency	Proxy for the municipality dependency to the FPM transference. It represents the part of FPM in relation to the total current revenue.	-
IFDM-S	IFDM- Health	Firjan Index of Municipal Development Health.	FIRJAN
IFDME-E	IFDM- Education	Firjan Index of Municipal Development - education.	FIRJAN
IFDM-ER	IFDM- Employment and Income	Firjan Index of Municipal Development-employment and income.	FIRJAN

Source: own authors

Considering the fact that many small municipalities form Minas Gerais and considering that the population size is preponderant for the economy development and for the public finance behaviour, the municipalities were classified in accordance with the inhabitants' number (Table 2).

Table 2 - Stratification of Minas Gerais municipalities by the number of inhabitants

Strata	Interval	Quantity of municipalities										
		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Small I	Up to 5.000	140	139	131	130	138	138	138	126	127	127	127
Small II	From 5.001 to 10.000	160	149	155	154	149	148	148	154	149	149	148

Small III	From 10.001 to 20.000	114	132	130	130	129	130	130	130	134	134	135
Midsize I	From 20.001 to 50.000	94	90	93	95	92	92	92	97	97	97	96
Midsize II	From 50.001 to 100.000	31	30	31	31	30	30	30	30	29	29	29
Big	Above 100.000	26	25	25	25	27	27	27	28	29	29	30
Total		565	565	565	565	565	565	565	565	565	565	565

Source: own authors based on data from the Brazilian Institute of Geography and Statistics (IBGE)

The time frame corresponds to 2006 to 2016, aiming at observing the periods of IPI exemption. The period from 2008 to 2011 was used as a reference to verify the performance of public finance before and after the IPI exemption that has mainly occurred from the sanctioned ordinances in these years, as exposed in the theoretical framework. The Extended National Consumer Price Index (IPCA) from the Brazilian Institute of Geography and Statistics (IBGE) adjusted all data on 12/31/2016. That said, the analysis were conducted in two parts and they were based on a previous and after exemption period, as seen in Table 2:

Table 2 - Delimitation of periods of analysis

	Exemptions			
	Ordinance no 6.687, of December 11th 2008		**Ordinance no 7.567 and no 7.660 of 2011**	
Period	**Panel A (2006 to 2011)**		**Panel B (2007 to 2016)**	
	Previous	Average from 2006 to 2008	Previous	Average from 2007 to 2011
	Posterior	Average from 2009 to 2011	Posterior	Average from 2012 to 2016

Source: The authors

Once the periods were established, the hypothesis test of differences of medians for paired samples was used, which, according to Bussab and Morettin (2010), is a test used when the observations of two samples are made from the same individual, measuring their characteristics before and after certain intervention. In the present study, considering that the objective is to analyze whether public finance of Minas Gerais municipalities suffered significant changes after the IPI exemption, the following hypothesis, representing each of the variables described in Table 1 were established:

H_0: differences among the variables related to Public Finance =0

H_1: differences among the variables related to Public Finance ≠0

The null hypothesis (H_0) presumed in the study infers that the difference between the median of each variable (Table 2) before and after the IPI exemption is zero, that is, the IPI exemption does not implicate in significant changes in municipal finance. In turn, the alternative hypothesis (H_1), implies that there is a difference between the medians of the variables before and after the exemption from the IPI, that is, there are indications that the exemption from the respective tax reflected statistically in the performance of public finances in the municipalities of Minas Gerais.

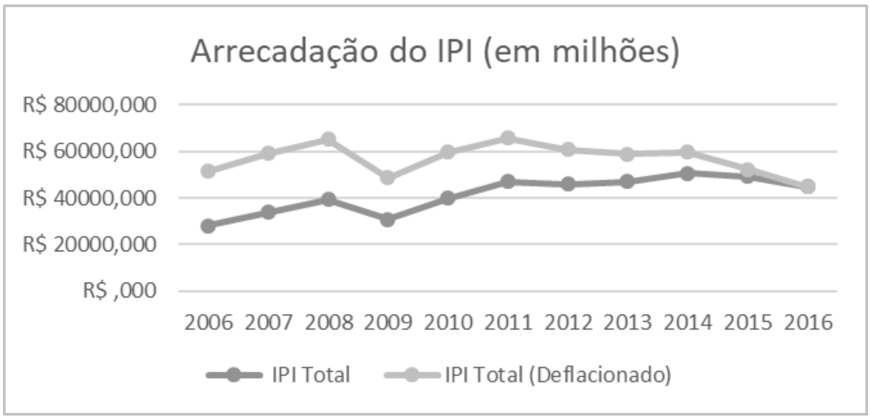
In order to apply the hypothesis test of median differences for paired observations in each of the variables described in Chart 1, the assumption of normality had to be verified in order to identify whether such a test will be a parametric or non-parametric test. That said, when performing the *Kolmogorov-Smirnov* normality test, we identified that the data do not follow a normal distribution, for a nominal significance level of 5% (α = 5%), being used in this study of the non-parametric *Wilcoxon* test.

The *Wilcoxon* test is a non-parametric test, alternative to the test *t* for paired samples, used to compare whether the position measurements of two paired samples are equal, at a given level of significance (PESTANA; GAGEIRO, 2005). In other words, it is a test that compares the behavior of the data in relation to one or more variables at two different times (before and after), being, therefore, appropriate to analyze the performance of public finances in the municipalities of Minas Gerais before and after the IPI tax exemptions.

RESULTS ANALYSIS

Analysis of the IPI revenue

In order to identify whether the public finances of the municipalities of Minas Gerais have undergone significant changes with the exemption from IPI, one must analyze the execution of municipal revenue over the analyzed period, as well as to know the behavior of the IPI revenue, identifying its variation. Considering this, graph 1 below shows the revenue of the federal tax for the period 2006-2016, considering the nominal and deflated values.



Graph 1: IPI revenue behavior over the years
Source: Research Results

Graph 1 features the two moments when the revenue of IPI decreased. The first, between 2008 and 2009, due to the federal government measures to reduce the respective tax rates, according to Temporary Statue nº 451 of November 14, 2008 and Decree nº 6.687 of December 11, 2008, attempting to face the consequences of the 2007/2008 economic crisis that started in the United States. The second, between 2011 and 2013, which resulted in the reduction of the rate for some sectors of the economy, automobile, import of inputs related to national security, among others, through decrees such as: Decree 7.437, MP 540 (Law 12.546), Decree 7.541, Decree 7,542, Decree 7,543, MP 544 (Law 12,598). Table 2 shows, by tax, the most relevant real variations and the factors that contributed to the result of the total IPI.

Table 2 - Revenue of IPI by type of product (in millions)

Year	IPI Tobacco	Var (%)	IPI Beverages	Var. (%)	IPI Autom.	Var. (%)	Linked IPI	Var. (%)	IPI Others	Var. (%)
2006	4.373,98	-	4.767,56	-	7.830,51	-	11.241,09	-	23.186,75	-
2007	4.899,10	12.0	4.513,05	**-5.3**	9.101,95	16.2	13.458,99	19.7	27.205,21	17.3
2008	5.298,52	8.1	4.022,87	**-10.9**	9.897,92	8.7	17.165,81	27.5	28.742,38	5.7
2009	5.242,88	**-1.0**	3.624,56	**-9.9**	3.248,99	**-67.2**	13.304,41	**-22.5**	23.230,64	**-19.2**
2010	5.534,30	5.6	3.614,29	**-0.3**	8.473,38	160.8	16.912,31	27.1	25.207,12	8.5
2011	5.251,35	**-5.1**	3.969,18	9.8	9.788,11	15.5	19.267,07	13.9	27.536,59	9.2
2012	5.404,04	2.9	4.171,05	5.1	5.468,48	**-44.1**	21.161,28	9.8	24.669,20	**-10.4**
2013	6.378,65	18.0	4.299,56	3.1	4.385,71	**-19.8**	19.036,81	**-10.0**	24.853,85	0.75
2014	6.650,26	4.3	3.932,64	**-8.5**	5.362,10	22.3	17.863,36	**-6.2**	25.838,48	3.9
2015	6.039,33	**-9.2**	2.708,01	**-31.1**	4.304,00	**-19.7**	17.877,16	0.08	21.431,87	**-17.1**
2016	5.716,59	**-5.3**	2.634,50	**-2.7**	2.884,62	**-32.9**	13.465,23	**-24.6**	20.250,37	**-5.5**

Source: Research Results, based on the National Treasury Secretariat.
Note: Deflated values (IPCA / 2016).

Table 2 shows that the sector suffering the greatest exemption from the IPI is the automobile sector, with emphasis on the year 2009, which registered a drop of 67.2%. Despite this reduction in the IPI on automobiles, Wilbert (2014), realized that even the exemption from IPI being capable of causing a behavioral change in the market, it did not cause any change in the sales trend, which may reflect in the increase in the collection of other taxes . However, in this same research, Wilbert (2014) states that if the IPI reduction had not happened, the result would have been a drop in car sales. Thus, the importance of the IPI is clear as a market stabilizer, reinforcing its feature as a regulatory instrument of an interventionist state.

The study of the National Confederation of Municipalities (2009), identified that the crisis of 2007/2008 and the measures of the federal government to face it, caused, in 2008, a relief of 69.60% of the IPI split in the sectors of automobiles, tobacco and others, which, added to a reduction of 11.39% in the Income Tax, were responsible for the fall of the FPM in 8.5% between the first quarter of 2008 until 2009. The CNM (2009) also shows that 6.5% of these 8.5% are attributed to the crisis and 1.9% to the expansion of FUNDEB's retention percentage. These figures caused a reduction in state transferences to the State of Minas Gerais by 12.5%, in February 2009.

Descriptive Statistics for the Variables

It is noticeable that the exemptions from the IPI caused considerable reductions in the general revenue of the Union, mainly in 2009, when the tax reduction reached the level of approximately 25%, when compared to the previous year. Since this tax is an important source of funds for the Municipal Participation Fund, the behavior of municipal finances in this period must be analyzed.

Table 3 - Descriptive statistics (average for the period 2006 to 2016)

	Small I		Small II		Small III	
	Average	**CV[1] (%)**	**Average**	**CV (%)**	**Average**	**CV (%)**
RC	BRL 12.422.324,05	21.13	BRL 17.060.176,36	28.55	BRL 29.724.590,77	31.85
IPTU	BRL 32.394,85	107.52	BRL 109.828,38	211.16	BRL 343.420,63	138.87
ITBI	BRL 49.492,86	108.38	BRL 111.497,47	112.20	BRL 276.385,83	96.51
ISS	BRL 240.552,11	242.68	BRL 458.187,65	255.71	BRL 808.314,05	130.63
TX	BRL 36.641,47	112.16	BRL 88.505,24	109.41	BRL 237.575,02	114.73
CM	BRL 3.368,61	398.72	BRL 9.068,78	404.13	BRL 12.842,83	338,84

FPM	BRL 69.799.273,93	1.00	BRL 7.614.719,26	16.86	BRL 11.400.814,81	15.82
Dep_FPM	0.5777	17.97	0.4677	23.37	0.4069	24.13
DC	BRL 9.619.756,95	21.46	BRL 13.193.409,80	25.49	BRL 23.495.638,65	31.80
IFDME-E	0.6671	7.54	0.6588	7.60	0.6731	8.41
IFDM-S	0.6353	14.73	0.6257	18.49	0.6135	22.58
IFDM-ER	0.4313	13.66	0.4524	17.31	0.4730	15.92
	Midsize I		**Midsize II**		**Big**	
	Average	**CV (%)**	**Average**	**CV (%)**	**Average**	**CV (%)**
RC	BRL 62.993.179,13	54.78	BRL 171.805.715,7	39.85	BRL 832.774.699,5	170.32
IPTU	BRL 1.106.789,15	128.62	BRL 5.402.693,41	105.39	BRL 51.388.591,29	294.43
ITBI	BRL 726.890,79	132.09	BRL 2.814.405,62	141.79	BRL 20.832.695,10	281.22
ISS	BRL 2.840.774,60	145.02	BRL 11.156.330,03	109.53	BRL 76.134.910,37	244.83
TX	BRL 793.119,68	126.18	BRL 2.486.040,79	62.84	BRL 18.172.689,39	218.32
CM	BRL 42.155,93	216.53	BRL 80.463,12	268.40	BRL 31.511,66	252.49
FPM	BRL 16.977.614,00	17.08	BRL 28.672.530,97	12.84	BRL 64.590.968,45	108.68
Dep_FPM	0.30242	26.39	0.1832	27.51	0.1213	46.83
DC	BRL 49.599.427,85	51.86	BRL 135.793.153,0	37.12	BRL 679.149.889,3	175.82
IFDME-E	0.6909	6.93	0.7253	4.09	0.7047	5.31
IFDM-S	0.6328	19.04	0.6926	7.41	0.7237	9.38
IFDM-ER	0.5324	16.72	0.6684	8.23	0.6763	9.77

Source: Research Results.
Notes: [1] Variation Coefficients

The results of the descriptive statistics show a disparity chart between municipalities of Minas Gerais, as shown by the variation coefficient, even inside strata formed by same size municipalities, which corroborates do the findings of Galvarro *et al* (2009) and Costa *et al* (2012), which found an inter-regional disparity chart in the national context. The variation is greater between the variables that represent municipal public finances, especially in terms of their own revenue, confirming the existence of distinguished fiscal efforts (MASSARDI; ABRANTES, 2015).

The bigger municipalities, with over 100 thousand inhabitants, presented the higher averages for the financial variables and also for municipal human development indexes, suggesting that better levels of exploration of economic activity and public finances yield better socioeconomic conditions.

On the other hand, it is noticeable that small municipalities (small I), have low revenue potential, receiving the biggest portion transferred as FPM (BRL 69.799.273,93). Besides, due to the low revenue flow, the FPM represents, on average, 57.7% of the current revenue in such municipalities, making them highly dependent on this financial resource. Also, the municipalities with no more than 20.000 inhabitants, small II and III, are FPM dependent to a level of 46.7% and 40.6%, respectively, corroborating to Massardi and Abrantes (2015) on the importance of FPM for municipalities with small populations and low economical potential.

Municipal finances before and after exemption from IPI

Aiming at verifying if the municipal finances showed significant changes after the exemption from IPI, the *Wilcoxon* test was carried out, with results laid in Table 3.

Table 3 - *Wilcoxon* Test Results

	RC	IPTU	ITBI	ISS	TX	CM	FPM	DC	IFDME-E	IFDM-S	IFDM-ER
Panel A											
Z	-20.01[a]	-13.42[a]	-13.59[a]	-15.46[a]	-10.13[a]	-2.15[b]	-20.08[a]	-19.88[a]	-20.56[a]	-13.63[a]	-2.70[a]
p-value	0.000	0.000	0.000	0.000	0.000	0.031	0.000	0.000	0.000	0.000	0.007
Panel B											
Z	-19.80[a]	-14.66[a]	-15.19[a]	-11.16[a]	-11.87[a]	-0.94[b]	-17.99[a]	-19.89[a]	-20.59[a]	-17.83[a]	-15.88[b]
p-value	0.000	0.000	0.000	0.000	0.000	0.346	0.000	0.000	0.000	0.000	0.000

Source: Research Results

Notes: [a], based on the negative *ranks*; [b]. based on the positive *ranks*

On panel A, that congregates the results of the *Wilcoxon* test for the period from 2006 and 2011, we noted that the *p-value* was smaller than $\alpha =$ 5% for all variables, suggesting that there is significant evidence of statistical differences on the behaviour of municipal finances before and after the Ordinance n. 6.687, published on December 11th, 2008, which indicated the set of measures for the exemption from IPI implemented by the federal government.

Consistent with the results obtained for Panel A, the results for the second period of analysis (Panel B) point to significant differences in the behavior of revenue flow (IPTU, ITBI, ISS and fees), for FPM and human development indexes, since the value *p* in the statistics of the *Wilcoxon* test was lower than the significance level ($\alpha =$ 5%), which meant rejecting the null hypothesis, excepting the special assessment tax, whose *p-value* was 0,346. We verified, therefore, that the alterations promoted by Decrees n. 7.567 and n. 7.660 of 2011, on IPI revenue flow also reflected on how public municipalities' finances behaved.

In general terms, both results obtained on panels A and B show that public finances and socio economic indexes of municipalities of Minas Gerais changed significantly after exemptions in 2008 and 2011. The existence of variations on public expenditure after IPI exemptions was also noticed by Oliveira, Pinto and Santa Rita, (2017), that reported alterations in the transfer of FPM to municipalities of Alagoas in 2009. However, the changes on the finances of municipalities in Minas Gerais were positive, suggesting that during that time there was an accession on the amount that corresponded to the municipalities' public revenue. This increase is mainly a result of the extension of the municipal tax base, which implicates greater levels of own revenue, which compensates the IPI reduction in the composition of the FPM passed on to the municipalities.

Furthermore, although the impact of the IPI tax exemptions on Union revenue, and, consequently, on municipal revenue, through the FPM, it is worth mentioning that the effects were not very significant, considering the results of this study. This since the policy of the federal government to provide financial support to municipalities, according to Temporary Statute No. 462 of May 2009, converted into Law No. 12,058 / 2009, with its publication meant that the amounts transferred under FPM were not so different from previous periods to the exemptions, in an attempt to minimize the negative effects of fiscal policy actions from the central government (ASSUNÇÃO; ORTIZ; PEREIRA, 2012).

Considering that the averages of the indicators are different, it is possible to identify, in Table 4, how many municipalities had an increase and how many had a reduction in the behavior of public finances and in the socioeconomic indicators after the implementation of the sets of exemptions described in panels A and B.

Table 4 - *Ranks* established by the *Wilcoxon* test for the paired samples

		Panel A			Panel B		
		N	**Ranks average**	**Sum of the ranks**	**N**	**Ranks average**	**Sum of the ranks**
RC	Negative Ranking	7	320.14	2241	13	236.62	3076
	Positive Ranking	558	282.53	157654	552	284.09	156819
	Total	565			565		
IPTU	Negative Ranking	144	193.42	27852	140	164.30	23002
	Positive Ranking	421	313.64	132043	425	322.10	136893
	Total	565			565		
ITBI	Negative Ranking	139	195.40	27161	115	182.12	20944
	Positive Ranking	426	311.58	132734	450	308.78	138951
	Total	565			565		
ISS	Negative Ranking	94	211.65	19895	171	214.15	36620
	Positive Ranking	471	297.24	140000	394	312.88	123275
	Total	565			565		
TX	Negative Ranking	160	253.83	40612	134	252.73	33866
	Positive Ranking	405	294.53	119283	431	292.41	126029
	Total	565			565		
CM	Negative Ranking	115	102.72	11813	137	123.34	16898
	Positive Ranking	85	97.49	8287	114	129.19	14728
	Ties	-			314		
	Total	565			565		
FPM	Negative Ranking	13	154.69	2011	39	258.67	10088
	Positive Ranking	552	286.02	157884	526	284.80	149807
	Total	565			565		
DC	Negative Ranking	27	102.52	2768	17	160.12	2722
	Positive Ranking	538	292.06	157127	548	286.81	157173
	Total	565			565		
IFHM-E	Negative Ranking	6	22.33	134	1	1	1
	Positive Ranking	559	285.80	159761	564	283.50	159894
	Total	565			565		
IFHM-S	Negative Ranking	134	201.75	27035	82	130.52	10703
	Positive Ranking	431	308.26	132860	483	308.89	149192
	Total	565			565		
IFDM-ER	Negative Ranking	250	277.82	69455	466	303.91	141623
	Positive Ranking	315	287.11	90440	99	184.57	18272
	Total	565			565		

Source: Research Results

As a result of the *ranks*, it is noted that for all the analyzed variables, the municipalities of Minas Gerais showed a positive variation, as evidenced by the greater amount of positive *ranks*. Panel A shows that less than 3% of the sample studied (13 municipalities) presented a reduction in the transfer of the FPM, 12 of these being small municipalities. Also, in that same period, there was an increase in revenue of more than 50% of the cases, with emphasis on the ISS, increasing in 471 municipalities.

Panel B shows that the number of municipalities with FPM reduction (negative *ranks*) was higher than the previous period analyzed (Panel A), reaching 39 municipalities, that is, the exemptions from the IPI implemented by Decrees No. 7,567 and No. 7,660 of 2011 negatively impacted a larger number of municipalities. On the other hand, there was a significant improvement in the socioeconomic development indicators, given that 564 and 483 municipalities registered an increase in IFDM Education and IFDM Health, respectively.

FINAL REMARKS

The present research sought to identify the effects of the exemption from IPI on the performance of public finances in the municipalities of Minas Gerais, as the Municipal Participation Fund (FPM), the main source of financing for municipal public spending, accounts for 24.5% of the net revenue IPI and Income Tax (IR).

The first results show the IPI behavior over the 11 years analyzed (2006 to 2016), in which it is possible to set two points of decline: one between 2008 and 2009 and another between 2011 and 2012, periods corresponding, respectively, to decrees n 6687 of 2008 and n 7,567 and n 7,660 of 2011 sanctioned by the federal government.

The second part of the study was carried out considering the reduction in the IPI revenue, evaluating the performance of public finances in the municipalities of Minas Gerais. For this purpose, the collection of funds, current expenses and the transference of the FPM from the municipalities of Minas Gerais were studied at two different times: a period before and another after the main decrees that resulted in the tax waiver of a significant portion of public resources.

The results of the *Wilcoxon* test indicated statistically significant variations in the behavior of public finances in the municipalities analyzed, especially for the variables of socioeconomic development. However, the variations found were positive for more than 50% of the municipalities analyzed, indicating an increase in the levels of tax revenue, including for the FPM, due to the financial support granted by the Federal Union. Few municipalities have suffered the negative impacts of the fiscal policy adopted by the federal government, which are characterized by small population, low economic dynamism and high financial dependence, which evince their vulnerability to the current system of intergovernmental transferences. Thus, since the IPI is a market stabilizer, given its extra-fiscal nature and the expressiveness in the composition of the Union's revenue, it is expected that the negative effects of tax waiver policies remain for these same municipalities, and ultimately compromise the financial autonomy or the continuity of their public policies.

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