



# Does the Manaus Free Trade Zone Have an Impact on Industry Efficiency?

Industrial policies aim at encouraging development and economic growth by increasing the competitiveness of local firms and promoting structural transformation. Therefore, the design of industrial policies that meet these objectives is strategic for the country. In practice, however, many of these policies have resulted in high fiscal costs without any empirical evidence of the alleged beneficial effects.

An industrial policy common to several countries is the free trade zone, areas where companies receive tax exemptions to encourage trade and accelerate industrial development in a given region. In Brazil, the Manaus Free Trade Zone (*Zona Franca de Manaus - ZFM*) was created over half a century ago with the aim of developing and boosting the industry and economy of the Northern region.

Nevertheless, the efficiency of this model has been put into question. In 2018, the World Bank pointed out that policies to support companies in Brazil presented limited results and have a high fiscal cost.<sup>1</sup> In fact, few studies evaluate the impact of tax and non-tax incentives on the development and industrialization of the region.

The present study, carried out by researchers from the Climate Policy Initiative/ Pontifical Catholic University of Rio de Janeiro (CPI/ PUC-Rio), seeks to contribute to this debate by analyzing the impact of ZFM on Brazilian industry, especially with regards to productive efficiency (PE) and energy efficiency (EE). The researchers note that the efficiency levels of ZFM and Brazil are similar and remain stable throughout the analyzed period. This means that, despite the high volume of tax reliefs granted to ZFM's industries, there is no evidence of efficiency gains.

Evaluating all industries at the aggregate level may not adequately represent the firms of the most important industries in the region. Thus, this analysis considers the most significant industries in the ZFM, including their associated tax exemptions, production, and representativeness in the workforce. Researchers find that the energy and productive efficiencies of these main industries in the ZFM did not show a marked difference from those in the rest of Brazil. **In other words, the operation of firms at ZFM has not translated into an increase in productive and energy efficiencies, not even in the cases of the most significant industries of ZFM.**

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<sup>1</sup> World Bank, 2018. "Jobs and growth: Brazil's productivity agenda".

## MANAUS FREE TRADE ZONE OVERVIEW

When the government applies lower taxation in an industrial sector or in a specific region, a distortion is created: the benefited firms can prosper and increase their market share, even if they are not the most efficient firms. In this context, ZFM becomes an especially interesting industrial policy, since several tax reliefs are granted to firms located in the Manaus Industrial Park (*Polo Industrial de Manaus* - PIM). The purpose of such benefits is to keep the sectors of the region competitive against more developed regions of the country and foreign companies.

The ZFM is divided into three sectors: commercial, agricultural, and industrial; the industrial sector being the main one. When the ZFM was structured in 1967, one of the major criticisms of the model was that the PIM industries would become assemblers of imported components. In order to fight this possibility, the government established minimum national content rates for products and maximum import limits for inputs in 1976. This measure, however, was later replaced by the Basic Productive Process (*Processo Produtivo Básico* - PPB) defined as the minimum set of operations that characterizes the industrialization of the product in question.<sup>2</sup>

The main PIM sectors consist of electronics and IT, two-wheel vehicle production, chemicals, plastics, and metallurgy, all of which are eligible for several tax reliefs. The tax exemptions that firms may receive include lower Import Duty (*Imposto de Importação* - II); State Sales Tax (*Imposto sobre a Circulação de Mercadorias e Serviços* - ICMS); Excise Tax (*Imposto sobre Produtos Industrializados* - IPI); Social Integration Program (*Programa de Integração Social* - PIS/PASEP); and Social Contribution on Billing (*Contribuição para o Financiamento da Seguridade Social* - CONFINS).<sup>3</sup>

In order to obtain the benefits, the company must comply with a series of requirements conditioned to its activity: the profits obtained must be reinvested in the region, productivity and competitiveness must be increasing, there must be an increase in job offer, and others (in accordance with the Basic Productive Process).<sup>4</sup>

According to the Federal Revenue of Brazil (*Receita Federal do Brasil* - RFB), estimated tax expenditures for the ZFM, Western Amazon (*Amazônia Ocidental*) and Free Trade Areas (FTA) for the industrial, agricultural, service, and trade sectors more than doubled from 2010 to 2015.<sup>5</sup> In 2015, they reached R\$ 27.8 billion. In 2015 alone, tax expenditures intended for ZFM's industrial sector exceeded R\$ 6 billion.<sup>6</sup>

This study evaluates the energy and productive efficiency indicators of the entire ZFM against those of the entire country in order to understand if the tax exemptions granted to the region by ZFM promotes improvements in industrial efficiency.

To measure the evolution of these indicators, this study uses annual data for the period 2003 to 2015 at the firm-level from three databases: Annual Survey of Industry (*Pesquisa Industrial Anual* - PIA), Annual Social Information Report (*Relação Anual de Informações Sociais* - RAIS), and average industrial

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2 Brasileiro, V.M.M.. "Análise do trabalho desenvolvido pela SUDAM e pela SUFRAMA para o desenvolvimento da Amazônia" (Analysis of the work developed by SUDAM and SUFRAMA for the development of the Amazon Region). Page 5. Available at: <https://bit.ly/2miyfaG>. Accessed on: September 12, 2019.

3 For PIS/PASEP and COFINS, the exemption is given only for internal receipts and sales, through a zero tax rate.

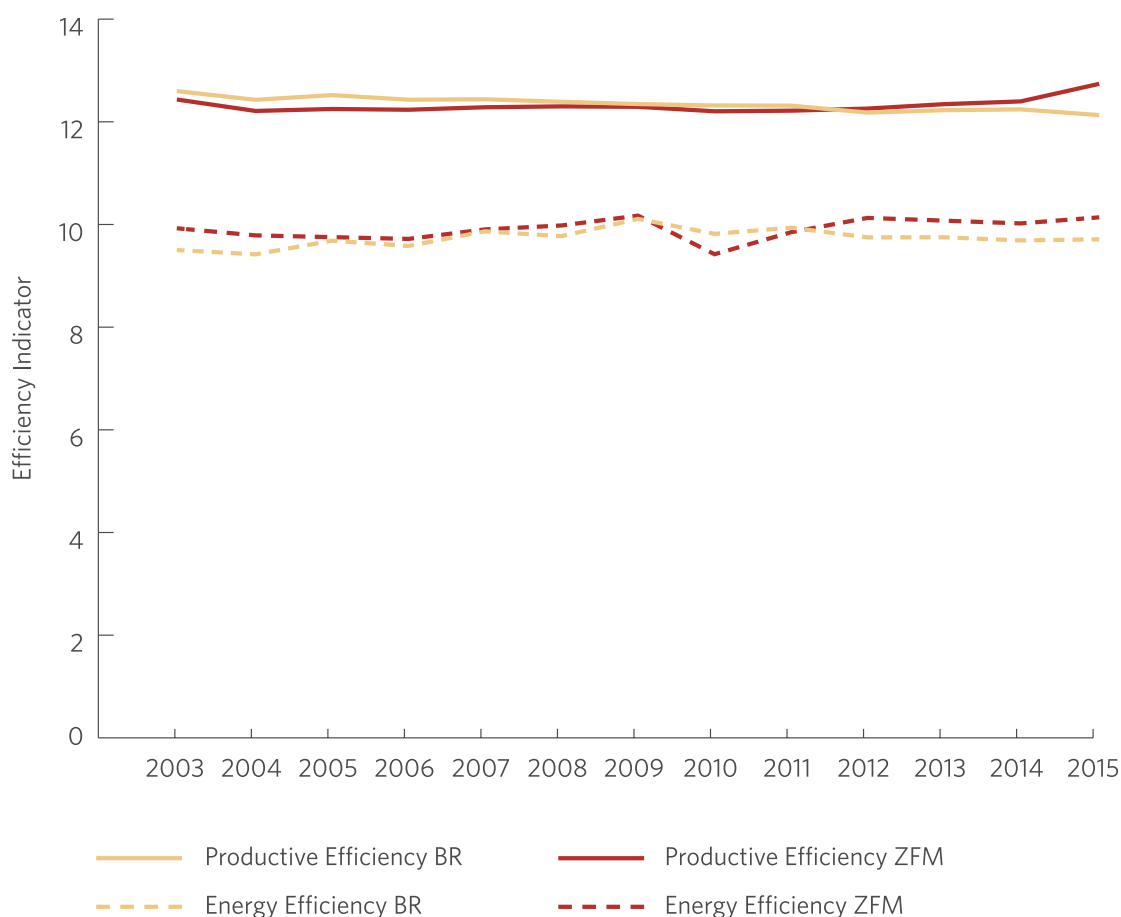
4 BRAZIL. Law No. 8,387, of December 30, 1991.

5 Estimated tax expenditures are estimated revenue losses from total exemptions.

6 ZFM and FTAs were excluded from the calculation, referring to special tax rates and purchases of goods.

tariff.<sup>7</sup> Merging these databases allows analysts to track the evolution of energy and productive efficiencies for Brazil and for ZFM. The firms' EE indicator is defined using the added value divided by the amount of electricity, while productive efficiency corresponds to the firm's added value divided by the number of employees. Figure 1 shows such indicators for the period from 2003 to 2015.

**Figure 1:** Evolution of energy and productive efficiencies for the aggregate industrial sectors in Brazil and the ZFM



**Source:** Climate Policy Initiative with data from PIA, RAIS, and ANEEL

Figure 1 shows that the energy and productive efficiency levels of ZFM and Brazil are similar and remain stable throughout the analyzed period. Despite the high volume of tax benefits granted to ZFM's companies, there is no indication of efficiency gains. Thus, the stability of the energy and productive efficiencies of the Brazilian manufacturing industry also applies to the ZFM, despite disparities in tax benefits.

<sup>7</sup> Brazilian Institute of Geography and Statistics (IBGE), Ministry of Economy, and National Electric Energy Agency (ANEEL), respectively.

## ESTIMATED TAX EXEMPTIONS

As previously mentioned, the efficiencies – energy and productive – of Brazil and ZFM demonstrate similar trends. This indicates that, despite the inherent fiscal attractiveness in the ZFM, the manufacturing industry in this region has a similar reality to the Brazilian industry in terms of efficiency levels. Thus, the similarity of these efficiency indicators, requires a disaggregated analysis to better understand the sector’s dynamics and the possible effect of tax benefits.

CPI analysts estimate exemptions per sector to assess whether the sectors that receive most of the tax benefits in the ZFM have different patterns than industry across Brazil. Estimation at the sector level requires calculating the ratio of the deductions and revenue for Brazil excluding the ZFM. With this tax rate, it is possible to calculate the difference between what each sector of the ZFM has actually paid in deductions and what they would have paid if they were not part of the ZFM (estimated tax rate multiplied by ZFM’s revenue). With this subtraction, it is possible to recover the value of the tax relief for each ZFM sector that surpasses Brazil’s.

Table 1 shows the share of each sector in the total amount of tax exemptions that ZFM surpasses the rest of the country. In addition, the table also presents sectors with the highest shares in ZFM’s total production and the largest concentration of the workforce in the ZFM compared to the country.

In 2015, of all the extra tax benefits given to the ZFM, two sectors stood out: two-wheel vehicle production and audio and video. Of the total estimated tax benefits that ZFM had, these sectors received 27% and 16% of that amount, respectively. As for production, the two-wheel vehicle production sector accounted for 15% of the total gross value of ZFM’s industrial production, while the audio and video sector accounted for 13%. As for the expressiveness in the workforce, of all firms in the audio and video sector in Brazil, 24% are concentrated in the ZFM. The ZFM two-wheel vehicle sector employs over half (56%) of all personnel working in this sector in Brazil.

**Table 1:** The most representative sectors of ZFM in terms of tax exemptions, production, and workforce

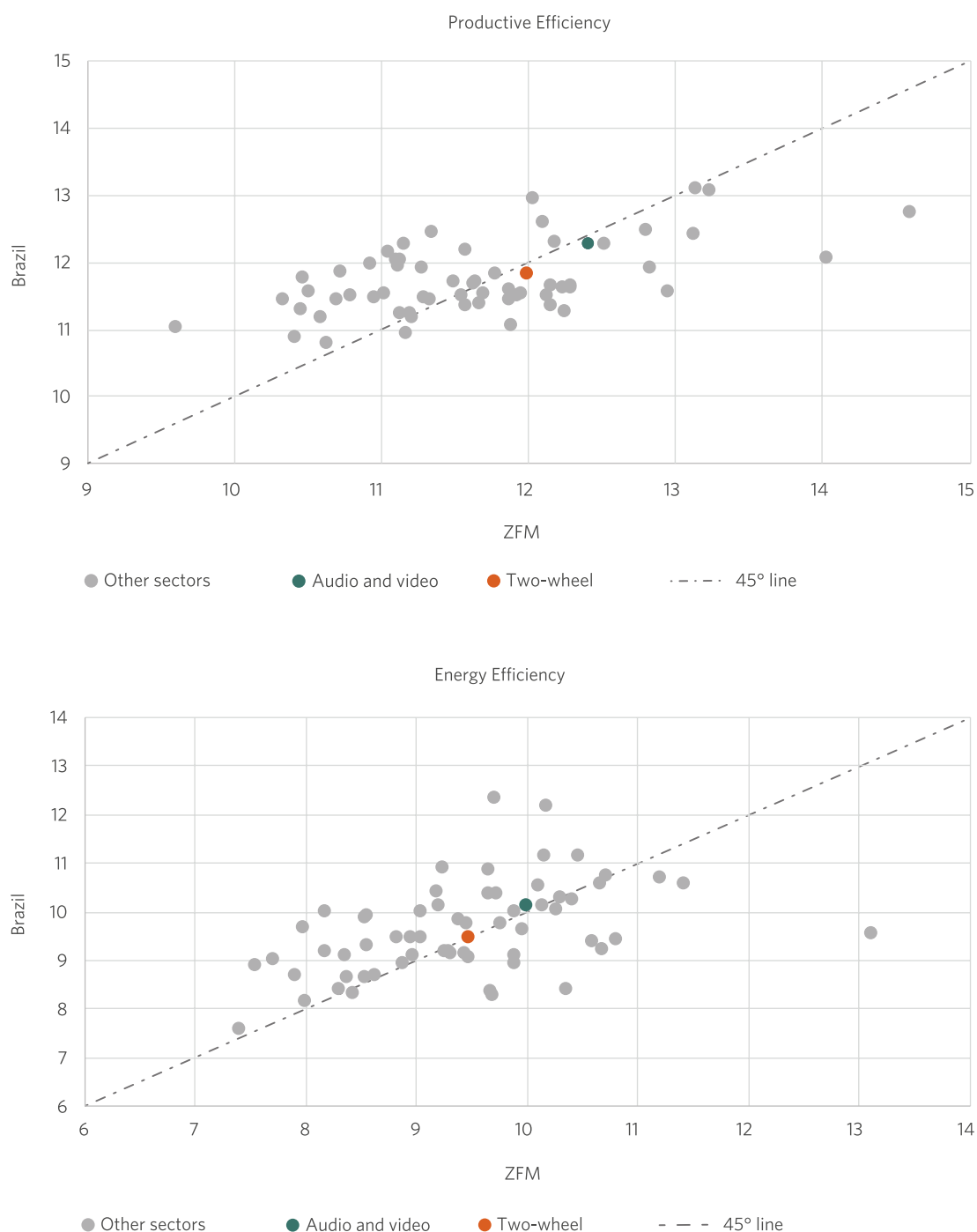
	Tax exemptions (%)	Production (%)	Workforce (%)	
	Estimated tax exemptions	Gross value of industrial production	Ratio of ZFM's firms	Ratio of total ZFM's employees
<b>Two-wheel</b>	27	15	18	56
<b>Audio and video</b>	16	13	24	42
<b>Non-alcoholic beverages</b>	8	12	3	3
<b>Plastic</b>	7	4	2	3
<b>Communication</b>	6	17	14	27
<b>Machinery and equipment</b>	3	4	1	5

*Source:* Climate Policy Initiative with data from PIA, RAIS, and ANEEL

Figure 2 shows, for the year 2015, the dispersion of the industrial sectors in Brazil and ZFM in relation to their energy and productive efficiencies, and the 45° line.

The sectoral analysis points out that despite the differentiated tax system, the two-wheel vehicle sector and the audio and video sector have similar levels of productive efficiency and energy efficiency compared to the rest of the country, given that both sectors are on the dotted 45° line. In this sense, tax benefits have not made the ZFM industries in these sectors more efficient than those in the same sectors in the rest of the country.

**Figure 2:** Dispersion of the productive and energy efficiency of the sectors for Brazil and the ZFM and the 45° line for the year 2015



*Source:* Climate Policy Initiative with data from PIA, RAIS, and ANEEL

## SECTORAL ANALYSIS

### Audio and video sector

It is difficult to differentiate ZFM's audio and video sector from that of Brazil, since both efficiencies are very similar. This indicates that for this sector, the location of companies in the ZFM does not translate into comparative advantages in terms of productive and energy efficiencies.

It is worth noting that this similarity between the indicators of Brazil and the ZFM is not justified by a total concentration of this industry in the PIM. Only 24% of the firms of this sector are located in the ZFM.

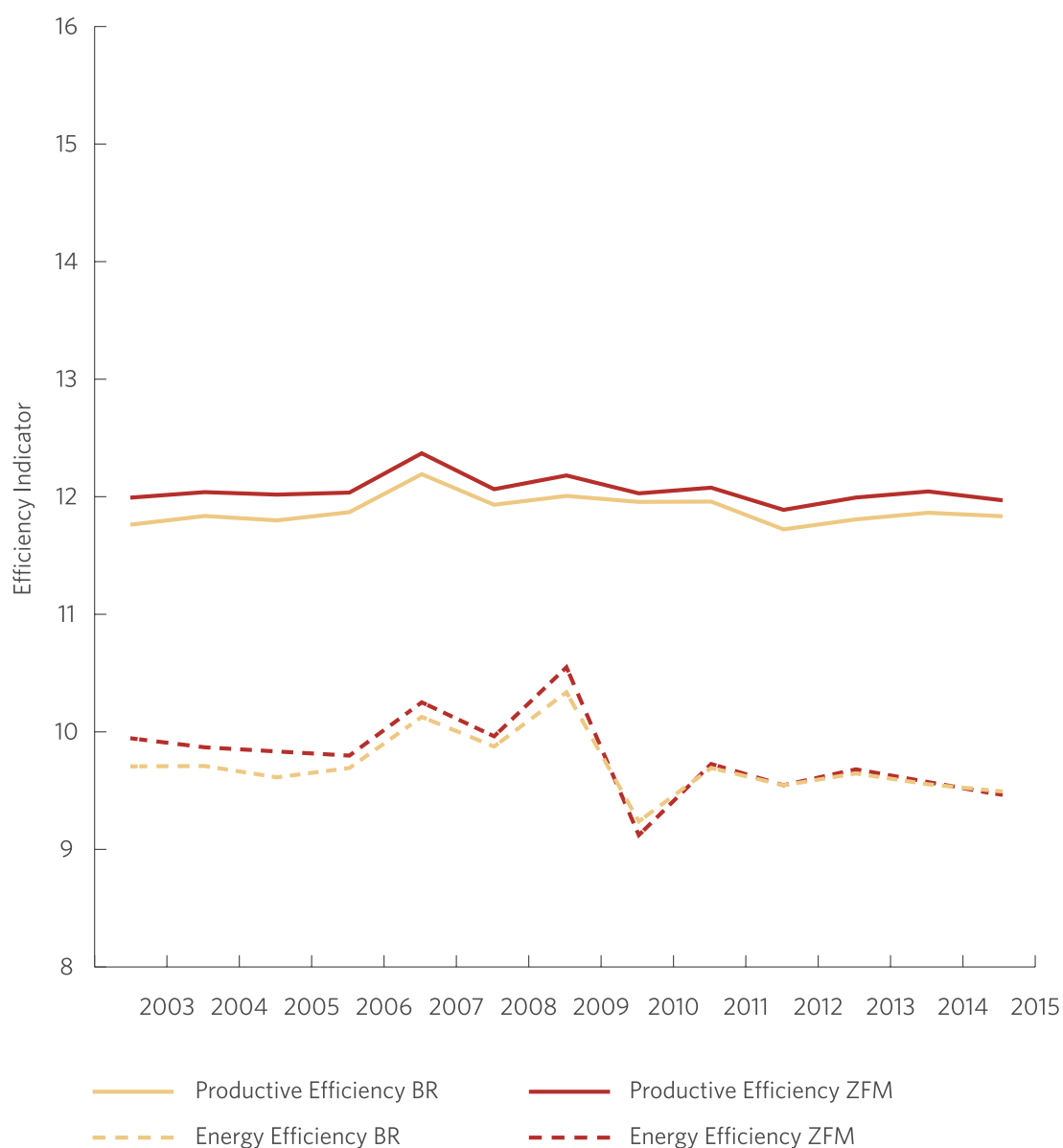


Source: Climate Policy Initiative with data from PIA, RAIS, and ANEEL

## Two-wheel vehicle production sector

Despite being the most benefited sector from ZFM's tax exemptions, compared to the rest of the country, and having factories of large companies installed for decades in the region, the two-wheel vehicle sector does not show any indication of improvement in its levels of efficiency over the years.

As in the audio and video sector, the similarity between Brazilian and ZFM's indicators cannot be justified by a total concentration of this industry in the PIM, since only 18% of the firms of this sector are located in the ZFM.



**Source:** Climate Policy Initiative with data from PIA, RAIS, and ANEEL

It is worth noting that even most relevant sectors of the ZFM do not stand out in relation to Brazil, given the similarity of efficiency indicators. This finding concludes that the benefits received by the ZFM are not translated into higher levels of efficiency.

## CONCLUSION

The researchers demonstrate in this study that, despite the tax benefits, ZFM industries are very similar, in terms of energy and productive efficiencies, to industry in general. Therefore, despite the tax exemptions, this industrial policy has not contributed to an increase in the country's productivity and energy efficiency.

This sector disaggregated analysis allows policymakers to better understand the dynamics inherent to each industrial sector. This work reveals that the ZFM firms are not more efficient than those in the rest of the country, yet they benefit from significant tax exemptions. These benefits have not led to an improvement in the efficiency of the firms.

Such findings set the stage to discuss the Brazilian industrial structure and the costs associated with it. This study emphasizes how lower production costs, arising from tax benefits, cannot be associated with increases in efficiency. Ultimately, this work highlights the need for policymakers to better understand the role that ZFM plays in promoting efficiency and in stimulating growth for the region and for the country. It is necessary to investigate the possibility that the consequences of tax exemptions are related only to the attractiveness to Manaus.

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*Climate Policy Initiative (CPI) works to improve the most important energy and land use policies around the world. We support decision makers through in-depth analysis on what works and what does not. CPI's Brazil program partners with the Pontifical Catholic University of Rio de Janeiro (PUC-Rio). This work is funded by the Instituto Clima e Sociedade - ICS.*

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