Do Brazilian Publicly Traded Companies That Pay Less Tax Create More Jobs?

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Abstract

This article studies whether there is an association between effective tax rate and job creation in private companies, based on a tax accounting perspective. In macroeconomic terms, there is a widespread assumption – challenged by authors such as Anderson and Pizzigati (2017) – indicating that lower corporate taxation will lead to higher rates of job creation. The study explores the relationship between job creation and three proxies of tax avoidance, or tax aggressiveness, in Brazilian non-financial firms listed in the country's stock exchange B3, in the period between 2011 and 2016. The estimates were conducted using the methods of ordinary least squares (OLS), and quantile regression. The results obtained from the estimates using OLS did not present significant evidence of an association between the rate of job creation and effective tax rates. Regarding the method of quantile regressions, it was possible to find a significant and positive relationship between job creation and effective tax rates, exclusively in quantile 25 of the effective tax rate on value added. Quantiles 50 and 75 presented negative relationships between job creation and effective tax rates in the different tax aggressiveness metrics. The results suggest that the firm’s tax aggressiveness profile influences the relationship. While in the less tax aggressive companies the reduction of the tax burden would potentially stimulate job creation, in those more tax aggressive the tax break may lead to the undesirable effect of a fall in job creation. This innovative and relevant study raises questions about the social efficiency of a general reduction of corporate taxes.

Keywords: Tax aggressiveness; tax avoidance; job creation rate; effective tax rate.
1 INTRODUCTION

Hanlon and Heitzman (2010, p. 128) carried out a literature review on tax research in the fields of accountancy, finance, and economics. They advocate that tax accounting researchers should incorporate or expand tax-related theories and evidence that are produced in economics and finance when they are relevant to tax research in accounting.

Pohlmann (2005, p. 7) adds that tax research is vast and complex, characterized by issues that often require a multifaceted view from researchers. For the author, therefore, tax research is multidisciplinary, and he suggests that the gathering between economists and accountants to study the impact of taxes on business decisions would result in advantages for both sides. The author observes that an economist would help an accountant to improve their capacity of economic analysis and modeling. On the other hand, working with an accountant would help the economist to develop an institutional vision of the company.

Hanlon and Heitzman (2010, p. 128) explain that tax research in economics usually focuses on (i) tax compliance; ii) tax incidence (who supports the corporate tax burden); iii) investments and the effects of economic growth, i.e., whether taxes affect investments; and iv) optimal tax policy. One area of study in economics is related to the job creation rate, which is explained through several factors in the literature.

Thus, this article uses statistical tests to identify the relationship between job creation and tax aggressiveness, seeking to answer the following questions: Do companies who pay less tax create more jobs? What could be the effect of a reduction of the corporate tax burden on the rate of job creation by the benefited companies?

According to Leigh (2018, p. 1), economic and tax literature commonly argues that the lower corporate tax burden leads to a higher job creation rate, and that much of the evidence for this proposition is based on macroeconomic models. However, this belief may be false, as suggested by Anderson and Pizzigati (2017). For the authors, the 92 most consistently profitable US companies with a high profile of tax aggressiveness recorded, on average, a negative job growth rate of 1% between 2008 and 2016. The job growth rate in the same years among US companies in the private sector, as a whole, was of 6%. As for the 92 companies that pay less tax, more than half of them (48 companies in total) eliminated jobs between 2008 and 2016, reducing 483,000 job positions.
Based on a tax accounting perspective, this research carried out a statistical analysis of the relationship between the effective tax rate and the job creation rate in corporations. The tests used ordinary least squares (OLS) and quantile regression in quantiles 25, 50 (median) and 75.

The results of the tests performed using ordinary least squares (OLS) and fixed effects in panel data did not show evidence of an association between the job creation rate and the effective tax rates. In the analysis of the quantile regression, the results were different according to the quantile analyzed. In quantile 25, a positive relation was observed between the job creation rate and the effective tax rate on value added.

In the other quantiles, the tests showed a negative relationship between job creation and effective tax rates. These results occurred in quantiles 50 and 75 and were observed for all the taxes considered in the research (effective tax rate related to income tax paid, tax accounting expenses on profit, and tax expenses on value added).

This article has five sections including this introduction. The second presents a literature review and the research hypothesis. The third presents the selection of the sample and the research project, as well as the descriptive statistics carried out on the sample. The fourth shows the multivariate analysis of the data and the discussion of the results, followed by the fifth section with the conclusions.

2 LITERATURE REVIEW AND HYPOTHESIS

The importance of this tax accounting research lies in the fact that, to the best of our knowledge, there are no studies in the respective Brazilian literature seeking evidence between job creation rate and effective corporate tax rate of income tax and the tax levied on the revenues resulting from practices of tax avoidance.

Another relevant point brought up in this research is that the variables that represent the practices of tax avoidance are independent variables, which is not common in tax accounting research.

The literature around tax research uses the terms ‘tax avoidance’ or ‘tax aggressiveness’ as a substitute for the term ‘tax planning.’
As Hanlon and Heitzman (2010, p. 27) point out, “the challenge for the area is that there are no universally accepted definitions of, or constructs for, tax avoidance or tax aggressiveness; the terms mean different things to different people.”

Therefore, in this article, we adopt the definition of tax avoidance and tax aggressiveness as defined by Hanlon and Heitzman (2010), i.e., the reduction of the explicit taxes, which reflect all transactions that influence the explicit tax liability of the company. This definition does not distinguish the practices characterized as ‘tax avoidance practices’ (explicitly designed to reduce taxes), and other activities of the company toward reducing taxes, such as the use of tax breaks.

2.1 Economic and tax research

According to a study by Ljungqvist & Smolyansky (2016, p. 31) with American companies, the increase in corporate tax rates is detrimental to workers, while corporate tax cuts are ineffective in increasing economic activity unless implemented during recessions. In that study, it was found that a one-percentage point increase in the corporate tax rate reduces employment between 0.3% and 0.5% and employment income between 0.3% and 0.6%, ceteris paribus. These estimates vary little over the business cycle and are remarkably stable through circumstances such as labor market flexibility, wealth, population density, or the dominance of small businesses. On the other hand, tax breaks are only useful in recessions, when they increase job creation by about 0.6% and employment income by about 1% for each percentage point cut in the tax rate.

In similar research, Kouparitsas, Prihardini, and Beames (2016, p.27) sought to show the effects of the tax burden reduction in the economic activity of Australian companies. The research showed that a cut in income taxes encourages investment, even after the increase in other types of taxes, or cutting government spending to recover lost revenue. The attraction of investments increases the capital stock and labor productivity.

The authors demonstrate that a 5% reduction in the tax rate of corporate income taxes, financed through a cut in government expenses, will cause a 1.1% pre-tax real increase in wages, and an increase of 0.1% in the job creation rate. Finally, the research estimates that if there is a 5% reduction in the tax rate of corporate income taxes, financed through an increase in value-added taxes, there will be a 1.1% pre-tax real increase in wages, and an increase of 0.4% in the job creation rate.
Dixon and Nassios (2016, p.1) researched the impact of a reduction in the corporate tax rate on the Australian economy since part of the government believed that a reduction in these taxes would attract more foreign investment, increasing wages and production. The authors concluded that a reduction in corporate taxes would stimulate production but reduce the growth of gross national income. Such a reduction, according to the authors, would result in higher real wages, which should be recognized as a distributive impact that favors workers. However, they assume that aggregate employment will not change in the long term.

Anderson and Pizzigati (2017, p.4) studied the validity of the US government’s claim that a reduction in the federal corporate tax rate would lead to an increase in the job creation rate in that country. The researchers detected that the reduction in the effective tax rate was an outcome of practices of tax avoidance employed by the companies that formed the research sample, which explored loopholes in the United States Federal Tax Code. The authors argue that the resources the companies saved through tax avoidance did not stimulate job creation but often served to increase the remuneration of their executives.

Because of the slow recuperation of the American economy due to the 2008-2009 recession, and facing the US federal government’s inertia in economic policy, Shuai and Chmura (2013, p. 4) examined whether a cut in the state corporate tax rate would affect job growth at the state level. The authors clarify that they chose to study the state corporate tax because this tax is a political tool of the states to directly influence the economy recovery.

The authors used two approaches to establish a connection between a state tax break applied to corporate profits and job creation rate. Based on general comparisons related to job creation it was possible to observe that, in the beginning, states that cut corporate income taxes had a slower job growth rate than states that did not make changes regarding corporate income taxes. After some years, however, it was observed that states that cut corporate income taxes have rebounded or even grown faster in terms of job creation. The fixed effects panel regression model used by Shuai and Chmura (2013) found that state corporate tax rates have a significant negative effect on job growth rate. Also, tax reduction has the benefit of short-term job growth as companies react and respond to the new policy. This additional benefit, however, is temporary, lasting only one year.

Neto and De Sousa (2001, p.13) used information from tax collection and national accounting in order to calculate, in Brazil, the effective macroeconomic tax rates related to i) taxation on consumption, ii) taxation on labor income, and iii) taxation on capital income. The researchers observed that the effective macroeconomic tax rates on taxation on consumption
and taxation on labor income are negatively correlated with the job creation rate, that is, when the macroeconomic tax rates increase, the job creation rate decreases. On the other hand, they observed that taxation on capital income is positively correlated with the job creation rate, which means that when macroeconomic tax rates increase, the job creation rate also increases.

Leigh (2018, p.3) analyzed whether profitable Australian companies that pay a lower effective tax rate on accounting profit and taxable profit have a higher rate of job creation. The author does not use macroeconomic variables and adopts variables derived from accounting profit and taxable profit. He separated the companies into two groups: those with a tax rate below 25% and those with a tax rate above 25%. Using taxes as a percentage of accounting profit or taxable profit, the results showed that, as a share of the accounting profit, companies with an effective tax rate of less than 25% eliminate jobs, while companies with an effective tax rate higher than 25% had an annual rate of job growth.

Leigh (2018) then compares his results with those obtained by Anderson and Pizzigati (2017) in the US, by dividing the companies studied into those with an effective tax rate above and below 20%. The results showed that Australian companies with an effective tax rate below 20% eliminate jobs at a rate of 0.1% per annum, the same amount as US companies with an effective tax rate below 20%. On the other hand, Australian companies with an effective tax rate above 20% increased employment at an annual rate of 2.0%, a slightly faster rate than the annual job growth rate of 0.8% for the US private sector as a whole.

Finally, in order to test any relationship across the data, Leigh (2018) regressed the average annual job growth rate in the firm’s effective tax rate. The results showed that the relationship is positive, suggesting that a higher effective tax rate is associated with a faster rate of job creation. The ratio is statistically significant when effective tax rates are calculated as a portion of taxable income, but it is not statistically significant when effective tax rates are calculated as a portion of accounting profit.

2.2 Accounting and tax research

In his PhD dissertation, Pohlmann (2005, p.60) carried out an extensive review of the literature and the following classification of tax research, considering the multidisciplinary nature of this discipline. The author established the following classification of the tax research as a whole: i) tax obedience; ii) audit and public tax management; iii) impact of taxes on taxpayer’s decisions; iv) Optimum taxation and economic efficiency of taxes; v)
macroeconomic aspects of taxation; vi) legal research, which is subdivided into a) legal-tax; b) accounting and tax audit; c) tax planning.

The literature on tax avoidance discusses international operations, the relationship between investment in tax planning and taxes due, and the tax shelter as the main reason for the decline of corporate income taxes in relation to GDP and the total collection. Also, the studies approach the association between reduction of effective tax rates and executives’ compensation and other issues that do not include the subject covered in this research.

Thus, to the best of our knowledge, there is no research in Brazilian tax accounting literature addressing the issue of establishing an association between the job creation rate and tax avoidance or tax aggressiveness.

In the international tax accounting literature, few studies establish a relationship between tax avoidance and job creation rate. The work by Blouin and Krull (2009, p. 1028) is an example. The authors carried out a study on firms’ characteristics and the relation of these characteristics on how they use repatriated funds to benefit from tax breaks offered by the US government to repatriate profits obtained abroad.

Under the American Jobs Creation Act of 2004, this tax break effectively reduced the tax rate on repatriations by US subsidiaries established abroad from 35% to 5.25%. This tax incentive was created to encourage American multinational corporations to repatriate funds held in foreign subsidiaries to the United States and to use those funds to create jobs and capital investment.

The study, however, found that the firms that used the tax benefit to repatriate profits were those with limited investment opportunities, which means that much of the money was used in operations of share repurchases. There was no evidence of promotion of business investment, job creation, or increased expenses in research and development.

2.3 Hypothesis

The relation between taxes and job creation rate is not addressed in an economic and tax-related point of view (as seen in the literature presented above), but rather from the tax accounting perspective. In other words, the statistical tests carried out in this research allows inferring whether firms reduce jobs as a consequence of tax aggressiveness practiced to reduce the tax burden on income or revenue.
As shown in this literature review, the evidence on the relationship between effective tax rate and job creation rate is not clear. Thus, based on a more general macroeconomic belief, this study tests the following hypothesis:

H₁: Brazilian publicly traded companies with lower effective tax rates have higher rates of job creation.

3 METHODOLOGY AND SAMPLING

3.1 Sample selection

The software Economática® was used to select the companies tested. The sample includes publicly traded Brazilian companies, listed in the stock exchange B3, and covers the period from 2011 to 2016. The sample excluded financial companies, those with losses before taxes, as well as companies that did not have the necessary data to compute the variables used in the analysis. Table 1 shows the sample selection process.

| TABLE 1: SAMPLE SELECTION PROCESS |
|------------------------------------|
| Total number of companies          | 651 |
| Exclusion of financial companies   | (147) |
| Exclusion of companies with a deficit before taxes | (126) |
| Exclusion of companies with lack of data | (263) |
| Number of companies after exclusions | 115 |

| | Years analyzed | Total of observations (115 X 6) |
|----------------|----------------|--------------------------------|
| | 6 | 690 |

Source: Elaborated by the authors with research data using ECONOMATICA®.

3.2 Measurement and models

According to Hanlon and Heitzman (2010), the literature presents several ways to measure tax avoidance. However, not all measurement is appropriate to address the different research questions. Thus, estimates of income and tax payments, essential factors for measuring tax avoidance, can be obtained from any source. Also, most measurements of tax avoidance are obtained from data collected in the firm’s financial statements.

Thus, we use three measurements of tax avoidance or tax aggressiveness in this research to examine the associations among the variables adopted in our model.
The first measurement is the variable Rate_CashETR (Cash effective tax rate), calculated as the total income taxes paid on cash basis, divided by the pre-tax accounting income. Because of the limitations in the disclosure of the firm’s financial statements, the numerator of the division above (total income taxes paid on cash basis) was obtained by using the following formula: Initial balance in the payable IRPJ/CSLL\(^1\) account, added to the IRPJ/CSLL calculated in income statement, deducting the final balance of the payable IRPJ/CSLL account. Thus, the variable Rate_CashETR may contain elements other than the effective payment of taxes, i.e., procedures such as compensations, provided for in the Brazilian legal-tax system.

Hanlon and Heitzman (2010, p. 34) explain that CashETR “is affected by tax deferral strategies but is not affected by changes in tax accounting accruals.” The annual cash ETR\(^2\) could make the numerator and denominator incompatible if the taxes paid in cash including the income taxes paid in a different period (for example, an audit of the tax authority completed in the current year), and the denominator included only the result of the current period.

The second measurement of tax avoidance or tax aggressiveness is the variable Rate_GaapETR (Effective income tax rate), which is calculated as total income tax expense divided by pre-tax accounting income, as observed by Hanlon and Heitzman (2010). The authors clarify that “a tax strategy that defers taxes (e.g., more accelerated depreciation for tax purposes) will not change GaapETR” (p. 34), and highlight several items that are not considered tax planning strategies and could affect GaapETR.

For Hanlon and Heitzman (2010), the GaapETR is the most used measurement to indicate the degree of tax aggressiveness. Thus, a low GaapETR means that a company is more aggressively engaged in tax planning than others with higher GaapETR.

The third measurement of tax avoidance or tax aggressiveness is the variable Rate_VAS (Effective tax rate on value added). This measurement was introduced in the Brazilian literature by Martinez and Motta (2015) and seeks to establish the firms’ tax aggressiveness realized in the total taxes levied on value added. The authors argue that this measurement captures tax avoidance or tax aggressiveness in a similar way to GaapETR. The measurement indicates that low taxation rates on value added means that the firm adopts tax avoidance practices. Also, when this measurement is used to compare different firms, the one with lower total effective tax rate is more tax aggressive.
The data to calculate Rate_VAS was obtained on the CVM website since it is not available on the Economática® software. For the calculation of the tax rate on revenues, we had to extract the values referring to the income tax. Thus, Rate_VAS is calculated as the tax burden of value added statement deducting the income tax, divided by the total value added to distribute.

It is important to emphasize that the Rate_GaapETR and Rate_CashETR measurements are exclusively related to corporate taxes, IRPJ and CSLL. Therefore, they refer to the effects of avoidance of these taxes specifically. The basis for calculating the aggressiveness is the pre-tax income. As for the Rate_VAS, it includes all direct and indirect taxes from the cities, states, and the union, using the value added as a basis to calculate the rate. It is noteworthy that its magnitude is not directly comparable with the measurements based on the effective tax rate (ETR).

The Rate_VAS stands out because this third measurement of tax avoidance, atypical in studies outside Brazil, is more comprehensive than those derived from the ETR, and it captures the effects of all taxes paid by a company. The information about these other taxes is available in the case of Brazilian publicly traded companies, since it is mandatory for them to report the Value Added Statement.

In order to obtain the variation of job creation in the companies of the sample, we used the variable Job_Gr_Rate, (number of the firm’s employees in the current year/number of employees in the previous year) – 1. The number of employees was collected from the reference form sent to CVM, using the software Empresas.NET. The model used to test the relationship between job creation rate and tax avoidance or tax aggressiveness, is:

\[
\text{Job_Gr_Rate}_{i,t} = \beta_0 + \beta_1 \text{Tax_Avoidance}_{i,t} + \beta_2 \text{Size}_{i,t} + \epsilon_{i,t}
\]  

Equation (1)

To perform the tests, the dependent variable ‘job’ was replaced by the variable JOB_GR_RATE. The independent variable that measures the effective tax rate (Tax_Avoidance) of the selected companies will be replaced by one of the following variables: Rate_CashETR, Rate_GaapETR, and Rate_VAS.

The last variable of the model (SIZE) is a control variable, which is obtained by calculating the natural log of sales.

The summary and form of calculation of all variables used in this study are presented in Table 2:
TABLE 2: SYNTHESIS OF THE VARIABLES

| VARIABLES    | MEANING                                                                 | CALCULATION                                                                 |
|--------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| JOB_GR_RATE  | Firm’s annual employment growth.                                         | (Number of employees in the current year/Number of employees in the previous year) – 1 |
| RATE_CASHETR | Cash effective tax rate.                                                 | Initial balance in the payable IRPJ/CSLL account + IRPJ/CSLL calculated in income statement – the final balance of the payable IRPJ/CSLL account. |
| RATE_GAAPETR | Effective income tax rate.                                              | Total income tax expense divided by pre-tax accounting income.               |
| RATE_VAS     | Effective tax rate on value added                                       | (Tax burden of value added statement – income tax)/Total value added to distribute |
| SIZE         | Firm’s size                                                             | Natural log of sales                                                         |

Source: Elaborated by the authors

After collected from Economatica® and CVM website, the data were processed in Excel® to generate the variables and the respective long and balanced panel. After this treatment, we carried out tests on STATA®.

3.3 Descriptive statistics

Table 3 shows the descriptive statistics, and the data was winsorized in the 1st and 99th percentages, due to the existence of outliers.

TABLE 03: DESCRIPTIVE STATISTICS

| Variables    | Observations | Standard deviation | Mean  | Quantile 25 | Median | Quantile 75 |
|--------------|--------------|--------------------|-------|-------------|--------|-------------|
| JOB_GR_RATE  | 688          | 0.2942             | 0.0449| -0.0429     | 0.0082 | 0.0721      |
| RATE_CASHETR | 689          | 0.3696             | 0.2418| 0.0573      | 0.1895 | 0.2947      |
| RATE_GAAPETR | 687          | 0.2119             | 0.2612| 0.1407      | 0.2541 | 0.3239      |
| RATE_VAS     | 689          | 0.2712             | 0.1407| 0.1407      | 0.2213 | 0.3540      |
| SIZE         | 690          | 1.5794             | 14.8876| 13.9293     | 14.8845| 15.8257     |

Source: Elaborated by the authors using Software Stata®.

The results are consistent with previous studies such as Martinez and Silva (2018), where it is verified that the effective tax rates of companies are lower than the legal rates. The means presented for the variables RATE_CASHETR (24.18%) and RATE_GAAPETR (26.12%) suggest that companies are paying income taxes, and calculating income tax expenses in their accounting reports, that are, on average, substantially lower than the official rate of 34%.

The analysis of the quantiles shows that the companies of the sample in quantile 25 are paying income taxes (Rate_Cashet) at an effective rate that is equal to or less than 5.73%. It is possible to observe in quantile 25 that these companies are calculating in their accounting reports, income tax rate (Rate_Gaapet) at an effective rate that is equal to or lower than 14.07%. These data show that 25% of the companies that make up the sample are carrying out tax
avoidance activities that substantially reduce their tax burden on income. The median (quantile 50), which represents 50% of the companies in the sample, shows that the cash effective tax rate is equal to or lower than 18.95%; and the effective rate of income tax calculated in the companies’ accounting reports is equal to or lower than 25.41%. These data show that 50% of companies are engaged in tax avoidance activities that substantially reduce their tax burden on income. Finally, the descriptive statistics presented in quantile 75 show that only 25% of the companies in the sample are paying income taxes with an effective rate that is equal to or greater than 29.47%; and that the income tax expense disclosed in the accounting reports represent an effective rate that is equal to or greater than 32.39%. Even if small, these rates are still below the legal tax rate of 34%.

As for the effective tax rate on value added (RATE_VAS), there is also a significant reduction of the tax burden, since the total tax burden legally provided is 39.25% (IPI and ICMS 15% each; COFINS 7.6%; and PIS/PASEP 1.65%) and the results showed: mean 14.07%; quantile 25, 14.07%; median 22.13%; and quantile 75, 35.40%.

The descriptive statistics for the variable JOB_GR_RATE resulted positive for the mean, median and quantile 75. The data collected showed that the companies researched increased the number of jobs by an annual average of 4.49%. As for the companies in quantile 50 and 75, they increased the number of jobs at an annual rate of 8.20% and 7.21%, respectively.

As for the companies in quantile 25, however, the descriptive statistics for the variable JOB_GR_RATE were negative. These firms are reducing the number of jobs at an annual rate of 4.29%.

4 ANALYSIS AND DISCUSSION

The data collected from Economatica® and the CVM website were processed using Excel®, generating the variables and the respective long and balanced panel, which allowed starting the statistical tests.

The tests were conducted after separating the sample into two groups, inspired by the procedure adopted by Leigh (2018). Therefore, we carried out the tests observing the mean, using ordinary least squares (OLS), and the quantile regression to calculate the results for quantiles 25, 50 (median), and 75.
Koenker and Basset (1978), pioneers of the quantile regression, point out that while the ordinary least squares lead to an estimate of the conditional mean of the dependent variable, quantile regression can be used to estimate any conditional quantile of the dependent variable.

Zamprogno, Jesus Filho, and Funchal (2009) add that it is possible to analyze the estimated coefficients, intuitively, via the quantile equation, in the same way as the coefficients of the OLS, but no longer as a mean effect but as a specific sensitivity to the quantile of the dependent variable. Thus, the coefficients of the quantile regression can be interpreted using the partial derivative of the conditional quantile in relation to each specific independent variable.

4.1 Multivariate analysis OLS

The model of fixed effect in panel data allowed performing the tests using the ordinary least squares (OLS). The results presented, however, did not present any significant evidence of an association between the effective tax rates and the job creation rate, as shown in table 4.

| Variables    | Observations | JOB_GR_RATE | INTERCEPT | R² Overall |
|--------------|--------------|-------------|-----------|------------|
|              | Coefficient  | P-Value     | Coefficient | P-Value   |
| RATE_CASHETR | 687          | -0.0378     | 0.356     | 1.8423     | 0.020      | 0.0031     |
| RATE_GAAPETR | 685          | -0.0739     | 0.161     | 1.9455     | 0.016      | 0.0020     |
| RATE_VAS     | 687          | -0.0525     | 0.680     | 1.9792     | 0.017      | 0.0044     |

Source: Elaborated by the authors using Software Stata®

4.2 Multivariate analysis – Quantile regression

In the analysis using quantile regression (with the studied companies divided into quartiles), the results presented significant evidence of an association between effective tax rates and job creation rate, as observed in table 5.

| JOB_GR_RATE | QUANTILE 25 | QUANTILE 50 | QUANTILE 75 |
|-------------|-------------|-------------|-------------|
|             | Coefficient | Pseudo R²   | Coefficient | Pseudo R² | Coefficient | Pseudo R² |
| RATE_CASHETR| -0.0104     | 0.0016      | -0.0195**   | 0.0010     | -0.0301     | 0.0010     |
| INTERCEPT   | -0.0679     | -0.0001     | -0.0214***  | 0.0026     | -0.0378**   | 0.0025     |
| RATE_GAAPETR| -0.0117     | 0.0032      | -0.0453     | 0.0052     | -0.0378**   | 0.0025     |
| INTERCEPT   | -0.0453     | 0.0052      | 0.0003      | -0.0738**  | 0.00883     | 0.0027     |

Note: ***, ** and * indicate statistic significance at levels 1%, 5%, and 10%, respectively.

Source: Elaborated by the authors using Software Stata®
4.3 Discussion of results

As documented in the OLS estimates, the results did not offer significant evidence of an association between effective tax rates and job creation rates. In other words, any reduction in the effective tax rate does not imply, on average, an increase in job creation rate.

When analyzing the results of the quantile regressions, it is possible to observe that some of the companies presented effective tax rates that are negatively (inversely) correlated to the job creation rate, i.e., when the effective tax rates decrease, the job creation rate increases. However, there is also a group of companies that present effective tax rates that are positively (directly) correlated with the job creation rate (when effective tax rates decrease, the job rate decreases).

Examining the variable that represents the cash effective tax rate (RATE_CASHETR), only quantile 50 shows a negative association (-0.0195) with statistical significance at the level of 5% (p-value = 0.022). This result suggests that the companies that are grouped around this quantile maintain an inverse relationship between cash effective tax rate and the job creation rate. Thus, a decrease in the effective tax rate would lead to an increase in the job creation rate, or an increase in the tax rate would reduce the job creation rate.

For the effective income tax rate (RATE_GAAPETR), quantile 50 shows a negative association (-0.0214) with statistical significance at the level of 1% (p-value = 0.012). Therefore, the companies in this quantile have an inverse relationship between the effective income tax rate and the job creation rate. The RATE_GAAPETR also presents a negative association (-0.0378) with a statistical significance of 5% in quantile 75.

Lastly, for the effective tax rate on value added (RATE_VAS), quantile 25 shows a positive association between the ETR and the job creation rate of 0.0480, with statistical significance at the level of 10% (p-value = 0.091). This result suggests that companies in this quantile are reducing the effective tax rate on value-added and reducing job creation rate at a level of 4.8% per annum. This rate on value-added also presents a negative association (-0.0738) with statistical significance at the level of 5% (p-value = 0.030) in the quartile 75.

When taken together, only part of the result is consistent with Leigh’s (2018) research, who documented a positive relationship, suggesting that a higher effective tax rate is associated with a higher job creation rate. This consistency is verified for quantile 25, regarding the effective tax rate on value added (RATE_VAS). In this case, it was observed that the firms that practice effective tax rate equal or inferior to 14.07% have a positive relationship between job creation rate.
creation rate and tax rates. For this group of firms that appear to be more tax aggressive, a reduction in the effective tax rate would lead to a reduction in the job growth rate, contrary to the general belief that reducing the tax burden results in more jobs.

For the other results, there was a negative relation between the effective tax rates and job creation rates. These results occurred in quantiles 50 and 75, and repeated for all proxies of tax aggressiveness applied in the research, namely CASHETR, GAAPETR, and VAS rates. For these firms, the results show an inverse relationship between the effective tax rate and the generation of jobs, so in these subgroups, a reduction in the effective tax rate could be effective for an increase in job creation.

The results show that the degree of tax aggressiveness of the company is crucial to identify the net effect of a reduction of taxes in job creation. Particular attention should be directed to those companies that present more aggressive behavior because, for them, tax reduction is not followed by job creation or increase in expenses with personnel.

5 CONCLUSION

The multidisciplinary nature of the tax research leads the tax accounting researcher to embrace and develop tax-related theories and evidence relevant to accounting but produced in the fields of economics and finance. Based on the tax accounting perspective, this study was conducted to identify, using statistical tests, the relationship between the job creation rate and the effective tax rate on value-added and income taxes in Brazilian publicly traded companies.

The companies of the sample were separated into groups during the application of the tests, conducted to identify the mean by using ordinary least squares (OLS). Also, the quantile regression was used to determine the results of the companies that make up quantiles 25, 50 (median), and 75.

The results of the tests performed using ordinary least squares (OLS), using the model of fixed effects in panel data, did not present significant evidence of an association between job creation rate and effective tax rates. In the analysis of the results obtained from the quantile regression, when considered together, only part of the findings was consistent with Leigh’s (2018) study. The consistency was verified in quantile 25 regarding the effective tax rate on value added, where a positive relation was found between effective tax rates and job creation rates. In these companies, therefore, when the effective tax rate is reduced, the job growth rate is also reduced. For the other quantile regressions, quantiles 50 and 75, there was a negative relation between effective tax rates and job creation.
The results suggest that the profile of corporate tax aggressiveness may influence the relationship between effective tax rate and the job creation rate. While in the less tax aggressive companies reducing the tax burden would potentially stimulate job creation, in those with a more aggressive profile, the measure may lead to a drop in the rate of job creation.

The findings documented are somewhat compatible with those reported by Anderson and Pizzigati (2017) for American companies, considering that the focus of the authors was on those companies characterized as very tax aggressive. For firms that avoid paying taxes, reducing the tax burden does not necessarily mean job creation, but only an increase in executive’s compensation packages and, in some cases, a significant reduction of jobs.

In addition to being innovative in the Brazilian context and addressing a relevant social issue, this research is up-to-date since it raises questions about the effectiveness of a general reduction in corporate taxation. We are living in a scenario with several proposals regarding tax reform advocating for more favorable corporate taxation. These proposals are based on the belief that this measure would stimulate growth and the level of employment. Against this backdrop, the findings of this research contribute to explain the complex relationship between the tax burden borne by companies and job creation.

Finally, the literature review and the evidence documented in this research allow us to conclude that the relationship between effective tax rate and job creation rate is still not clear. Therefore, it is crucial to promote new tax accounting research around this issue, analyzing in depth the effects of the tax avoidance practices in this relationship. Future research may carry out studies controlling economic sectors, or factors such as the use of intangibles, fixed capital, and the level of education, and qualification required from employees.

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1 IRPJ (*Imposto de Renda das Pessoas Jurídicas*) [Corporation tax]; CSLL (*Contribuição Social sobre o Lucro Líquido*) [Social contribution on net income].

2 Effective Tax Rates.

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