

## ANALYSIS OF THE GENERATION AND DISTRIBUTION OF WEALTH AMONG COMPANIES FROM DIFFERENT SECTORS IN BRAZIL

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### ABSTRACT

*This study aimed at using Added Value Statement data (DVA) - mandatory in Brazil since January 1, 2008 - to compare the generation and distribution of wealth – value added - of different sectors companies. After a preliminary study, an intentional non-statistical sample composed of 23 (twenty-three) Brazilian companies, publicly traded, of several sectors that have the highest historical publication of DVA was built. From the sample used in the analysis, one company was set apart in order to serve as a parameter for comparison with the rest of the companies. The company chosen was Petrobras, because of its DVA publication history and for its importance as the largest Brazilian company. The results of Petrobras' generation and distribution of wealth were compared to the remaining 22 (twenty-two) companies in the sample considering the same period. The variables analyzed were: added value distributed as wages, added value distributed as government taxes, added value distributed to financial lenders as interests, added value distributed as dividends, added value received in transfers from other entities, the potential of sales to wealth generation and the potential of equity to wealth generation. The variables were analyzed using graphical and non-parametric statistical tests for independent samples. Mann-Whitney and Kolmogorov-Smirnov statistical tests pointed out that Petrobras distributes a smaller share of their wealth in form of wages in comparison with the average of the group of companies in the sample, while distributing a larger share in the form of taxes. The added value shares distributed to financial lenders and as interest on capital did not show statistically significant differences among Petrobras and the other companies in the sample. Statistical tests for wealth generation indicated a higher average performance for Petrobras in comparison with the other companies in the sample.*

**Keywords:** *Value added. Wealth distribution. Statement of Added Value*

### 1. INTRODUCTION

There is evidence that the economic and social changes seen in recent years point towards an increasing demand of countries as to the social function of companies. The answer to fulfill this demand has been several changes in corporate law.

One example of this issue is that publicly traded companies in Brazil are required to publish a Value Added Statement (DVA). De Luca et al. (2009) understand that the social commitment of a company is much higher today than it was a few years ago. The authors state that companies have become fundamental agents in the social development of nations. They point out that countries have demanded more of companies in an attempt to find answers to the socio-economic problems arising from the operation of enterprises.

One of the main ways to measure the contribution of a company to a country's population lies in the way that the company distributes the wealth generated in a given period.

The Value Added Statement – DVA is the appropriate instrument to demonstrate the generation and distribution of the wealth generated by a company.

Brazilian public companies have been required by Brazilian law number 11.638 / 07 to publish a DVA since January 1, 2008.

This paper presents an analysis of the data from a sample of Brazilian companies DVAs from different sectors in an attempt to answer the question regarding the possibility of a comparison between aspects of wealth generation for companies belonging to different sectors, since several studies in the past have only shown comparisons between companies belonging to the same sector.

The contribution of this study lies in the fact that it uses real companies' data and demonstrates the potential for wealth generation of companies belonging to different sectors. Another contribution it provides is the comparison of aspects of wealth generation and distribution by a single company - Petrobras in this case - with the results of other companies belonging to different sectors, an issue that had not been explored Brazil's literature until now.

## 2. PROBLEM SITUATION

Despite the fact that DVA has been widely demonstrated and explored, we do not find significant studies showing analysis of the generation and distribution of wealth from a single company inserted in a larger context outside its own sector. Unlike studies that compare and analyze companies individually, we can find pioneering and meaningful studies in Brazil that were based on the analysis of companies or industry groups clusters; these studies demonstrate aspects of DVA and its potential. Cunha, Ribeiro and Santos (2005), for example, published a study in which they analyzed 416 companies' DVA data for the period of 1999 to 2003, separating them into two groups, the first one containing the data of 416 companies from various sectors and the second one containing 192 companies' data of other sectors such as utility, wholesale and foreign trade, chemicals and petrochemicals, steel and metal and the food industry. One of the results of this study is presented in a Figure 1.

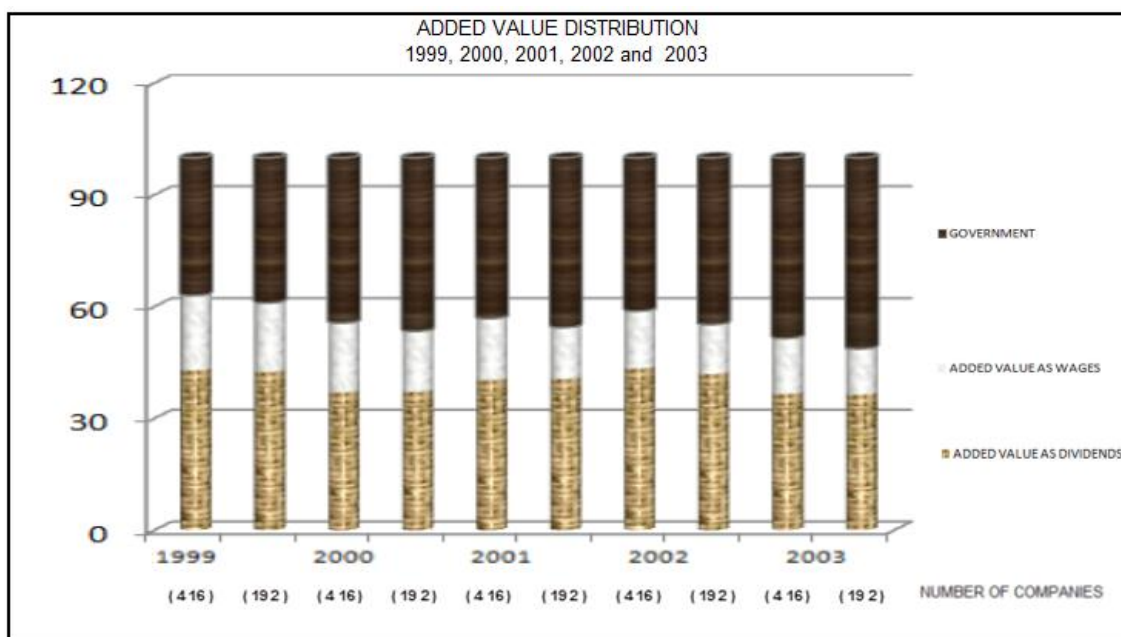


Figure 1 - The Statement of Value Added as a measuring instrument for wealth distribution.  
Source: adapted by authors from Cunha, Ribeiro and Santos(2005).

From the results shown in Figure 1, the authors Cunha, 2005, p. 18-19, concluded:

As can be seen, the comparison of the total sample (416 companies), referring to the distribution of wealth, shows very few differences. The largest, in percentage points, is the participation of the Government in 2002. In that year, all companies of the sample had a percentage tax of 41.2%, while the five specified sectors previously reached 44.8%, a difference of 3.6 percents. In that comparison between companies of the total sample and all five sectors analyzed, that draws the most attention is the decrease in wealth distributed as wages; in both cases this reduction is significant. In the period 1999/2003, the employees of companies saw their share in the wealth fall from 20.1% to 14.9%; in the five sectors analyzed the reduction was still largest, fell from 18.5% to 12.3%.

By the authors conclusion, we can understand that the added value analysis can demonstrate important aspects of sectors and companies.

One can understand that the analysis of sectors is extremely important when focusing in the characteristics of a similar cluster of companies that operate in similar conditions market, however, the analysis of individual companies can also show particular aspects including their relative importance in the formation of the country's Gross Domestic Product-GDP. Giving the gap in the literature concerning individual aspects of companies DVAs obtained through empirical research, the objective of this study was to analyze the aspects of generation and distribution of wealth of a single company comparing the results with other companies from different sectors and using Petrobras as a benchmark. Petrobras was selected because of its DVA publication history and its importance as the largest Brazilian company. Its results were compared to other 22 (twenty-two) large Brazilian companies that operate in various sectors, all of them with DVA publication histories. The research covered the period of 2000 to 2009.

We believe that the innovation brought on by this study is the empirical evidence of the set of observations that are possible when comparing different sectors.

Thus, the question we have tried to address in this study was:

How disparate are the wealth generation and distribution indicators of each company when the characteristics of each specific sector are not taken into account?

### **3. THE ADDED VALUE CONCEPT CONTAINED IN DVA**

Technically, the wealth generated by a company in a given period is called added value. The added value created by a given company is distributed in different ways transforming the company in an agent for the generation and distribution of wealth Tinoco (2001) notes that the DVA is not intended to replace the Income Statement, which has the task of detailing the net income of the period. In fact, the main objective of the DVA is to provide information to "shareholders".

The concept of added value generated by a company derives from the concepts of Gross National Product (GNP), Gross Domestic Product (GDP) and Net National Product (NLP).

On the economic concept of added value, Kroetz (2000) comments on his work that with DVA it is possible to know the economic contribution of the entity for the various segments that it relates to. In addition, the author explains that the concept of added value produced by the company is the share of Gross Domestic Product (GDP) produced by the entity individually.

Santos (2007), explains that from an Economics perspective, the added value is linked to the calculation of the national product. The author also explains that from a Microeconomics standpoint, the added value of a company is the value that a company can add to inputs during the production process.

An additional explanation is needed: The calculation of the GDP by the economists is based on production, whereas the accounting calculation of added value is based on the accounting concept of realization of income, that is, the accounting principle of competence. Larraz (2007) explains that despite the fact that the information about added value presented by accountants and calculated by economists shows differences in their calculation, it is possible to reconcile the added value calculated by both production and sales.

One of the main methodological differences between the economic concept of added value and the added value of companies, evidenced in DVA, is that the DVA uses a company's financial data in a given period, while the economic models are based on the GNP, GDP and NLP estimated using production data (at least part of the calculation).

Although there are temporal and methodological differences between the Accounting and Economics models for the calculation of added value, the DVA is based on macroeconomic concepts, seeking to disclosure the share of contribution that the entity made in the formation of Gross Domestic Product (GDP). The DVA shows the value that the company adds to inputs purchased from other companies, which are sold or consumed during a given period.

The Accounting Pronouncements Committee (CPC) on its No. 09 pronouncement states that the Added Value Statement (DVA), which is part of a company's Social Report, aims at highlighting the wealth created and distributed by the entity during a given period.

Through DVA analysis, it is possible to know the value of the wealth generated and its distribution.

The DVA is based on values from the company's accounting data and should present the wealth distribution created that is detailed on the table below:

ADDED VALUE STATEMENT		
NAME OF COMPANY		
DESCRIPTION	YEAR REFERRED \$ 0.000	LAST YEAR \$ 0.000
1-SALES		
1.1) SALES INCOME		
1.2) PROVISION FOR LOSS		
2-SUPPLIERS OF MATERIAL AMOUNT (include taxes)		
2.1) ROW-MATERIALS USED		
2.2) COSTS OF MATERIALS AD SERVICES		
2.3) MATERIAL, ENERGY, SERVICES, OTHERS.		
2.4) LOSSES/RECOVERY ASSETS		
3 – GROSS ADDED VALUE (1-2)		
4 – RETENTIONS		
4.1) DEPRECIATION, AMORTIZATION, DEPLETION		
5 – NET ADDED VALUE PRODUCED BY COMPANY (3-4)		
6 – ADDED VALUE RECEIVED BY TRANSFER		
6.1) EQUITY ACCOUNTING RESULT		
6.2) FINANCIAL INCOME		
7 – TOTAL ADDED VALUE TO DISTRIBUTE (5+6)		
8 – ADDED VALUE DISTRIBUTION		
8.1) WAGES AND BENEFITS		
8.2) TAXES		
8.3) INTERESTS AND RENTS		
8.4) DIVIDENDS AND OTHERS PAYMENTS TO SHAREHOLDERS		
8.5) RETAINED EARNINGS / LOSS		

Table 1 – Summary of the DVA required model contained in the pronouncement Number.9 to the CPC for non-financial Brazilian corporations. (Adapted by the authors)

According to the model, it is possible to know if the shares of the wealth created and who are its beneficiaries. It is also possible to compare companies from different sectors, their total wealth and its beneficiaries.

Even though it has only recently been included in the list of compulsory statements in Brazil, DVA's history begins in the 70s. According to, Luca et al. (2009): "the interest in DVA emerged in the UK in the 1970s, gaining popularity after its inclusion in the annual reports of German, Belgian, Dutch and Norwegian companies."

On the importance of this demonstration, we can mention Santos (1999):

The Added Value Statement, important social reporting component, must be understood as the most competent tool created by accounting to assist in the measurement and demonstration of generation capacity and distribution of the wealth of an entity.

The DVA allows us to evaluate the relative contribution made by companies of different sizes and sectors. We must emphasize that if we assume that companies are different in many ways, the generation and distribution of wealth can also be considered different.

#### 4. RESEARCH METHODOLOGY

This study is characterized by the empirical-analytical approach described by Martins (2000) as:

[...] approaches that have in common the use of collection techniques, processing and analysis of quantitative data predominantly. Emphasize practical studies. The proposals of this method have a technical character, restorative and incremental.

[...] The validation of scientific proof is done by testing instruments, significance levels and systematization of operational definitions.

Secondary data for the research and analysis of results in this work were obtained from FIPECAFI (Institute for Accounting, Actuarial and Financial Research Foundation).

##### 4.1 Sample characteristics

In order to highlight and analyze the distribution of the wealth generated by companies from different sectors in Brazil, an intentional and non-statistical sample containing a group of 23 (twenty-three) large Brazilian companies from different industry sectors was constituted. The period of analysis spans ten years, from 2000 to 2009. The companies in the sample are: Klabin; Natura; Gerdau; Braskem; Lojas Americanas; CSN; Souza Cruz; Telemar; Copel; CPFL; Sabesp; Cemig; Vale; CESP; Eletropaulo; Cosan; Marfrig; Duratex; Usiminas; Gafisa; Ambev, Embraer and Petrobras. These 23 (twenty-three) companies were chosen because they are the largest public companies in Brazil which have an extensive DVA publication history including the period before the publishing of Law 11.638 / 07. These companies were also chosen because they have a high level of accounting disclosure among Brazilian companies. The data used in this study were provided by the Institute for Accounting, Actuarial and Financial Research Foundation - FIPECAFI, which is a foundation of institutional support of the Accounting and Actuarial Science Department at the Faculty of Economics, Business and Accounting (FEA / USP) at University of São Paulo. For comparative and evidenciation purposes of the DVA informative potential, Petrobras was set apart and served as a benchmark for the rest of the 22 (twenty-two) companies in the sample.

The choice of Petrobras as benchmark is due to its single character and its high degree of disclosure, which gives it a different status among large Brazilian companies. Another aspect that motivated this choice lies in the fact that in recent years, after the discovery of oil reserves in the pre-salt, Petrobras acquired a fundamental role in the current economic life of the country in order to be identified as Brazil's largest company and one of the largest companies in the world. Forbes Magazine placed Petrobras among the largest companies in the world in 2010, remaining as the best placed Brazilian company in the list. The magazine's criteria for the classification takes into account annual sales in dollar, profits, assets and market value.

Firstly, we identified companies that had published at least three DVAs from 2000 to 2009 with some representation in the Bovespa Index or participating in enterprise groups with representation in this index over the analysis period. After that, we defined what data would be collected from the database maintained by FIPECAFI.

The data collection period span ten years, from 2000 to 2009. The sample contains 23 (twenty-three) companies, one of which being Petrobras, which served as the basis for the analysis, as previously explained, and the other 22 (twenty-two) companies were selected as the “the control group”.

The variables analyzed were: added value distributed as wages, added value distributed as government taxes, added value distributed to financial lenders, added value distributed as interest on capital, added value received in transfers from other entities, the potential of sales for wealth generation and the potential of equity for wealth generation.

Considering the separation between the values, for Petrobras and for the control group, means were calculated and we proceeded to calculate the results of each test.

#### 4.2 Method used for data analysis

The data extracted from the companies DVAs were analyzed using the Mann-Whitney test, following the example of Machado et al. (2009), who used DVA data in his work to analyze the distribution of wealth to the employees of the electricity sector in Brazil. The Mann-Whitney’s U test was also applied in this work at a significance level of 5%, which means that when the p-value is higher than the level of significance, the null hypothesis of equality means cannot be rejected, on the other hand, if the p-value is less than the level of significance, the null hypothesis of equality means must be rejected and the averages should be considered different.

In order to confirm the results of the Mann-Whitney test, the Kolmogorov-Smirnov test, which has its main application as a test to check the normality of a distribution, was additionally used. Bisquerra et al. (2004), argue that the Kolmogorov-Smirnov test may have other applications. The authors explain that one of the applications is to confirm if two independent samples are from the same population. Traditionally the Kolmogorov-Smirnov test is used to compare an empirical sample with the theoretical normal distribution, however, when using this test for differences in means its function is to contrast two empirical distributions. In the case of this study, two distributions were confronted, one formed by the Petrobras DVA data and the other formed by the control group’s DVA data.

### 5. ANALYSIS OF RESULTS

#### 5.1 Analysis of the added value distribution

First, we analyzed the average percentage of added value paid to employees by Petrobras in comparison to the control group, the average percentages are shown in Figure 2.

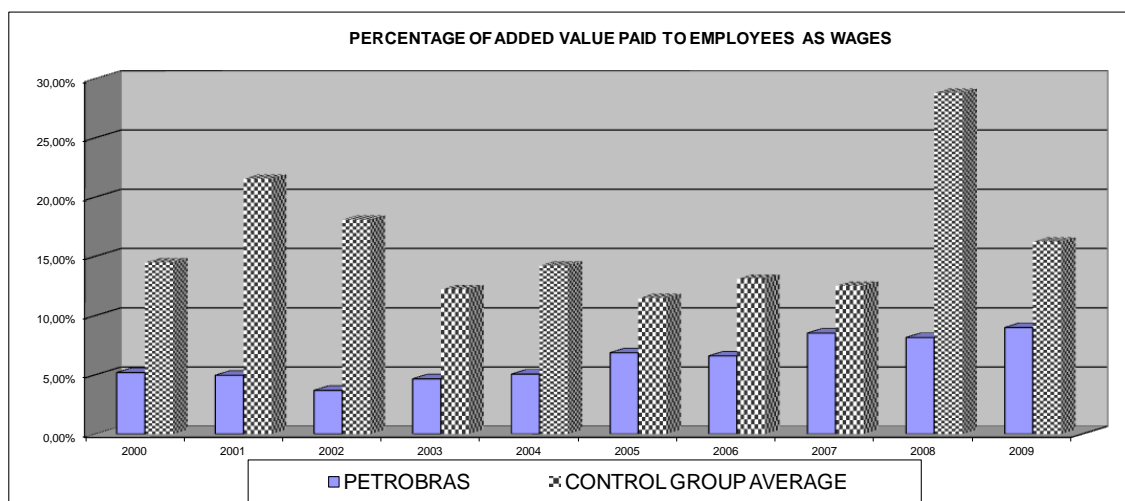


Figure 2 – Average percentage paid to employees as wages.

Next, we analyzed the results of the Mann-Whitney and Kolmogorov-Smirnov tests for the average percentage of added value distributed to the employees presented in Table 2.

PERCENTAGE OF ADDED VALUE PAID TO EMPLOEES AS WAGES	
H0 : $\mu$ Petrobras = $\mu$ Control group	
H1 : $\mu$ Petrobras < $\mu$ Control group	
AVERAGE RESULTS	
Petrobras	Control group
6,25%	16,48%
Mann-Whitney U test	
p-value (two-tail).....	0,002
Kolmogorov-Smirnov test	
p-value (two-tail).....	0,001

Table 2 - Percentage of added value paid to employees statistic test.



For both tests it is considered that if the p-value is greater than the confidence level of 5%, the null hypothesis of equality between the means cannot be rejected. However, in Table 2 we have indicated a p-value of 0.002 to the Mann-Whitney test, and 0.001 for the Kolmogorov-Smirnov test. Since both tests indicated that the null hypothesis cannot be accepted in this case, we can conclude that there is evidence that the average statistics of added value paid to employees is lower for Petrobras in comparison to the control group. It is important to mention that the difference between the means of 6.25% and 16.48% cannot be attributed to chance.

Figure 3 shows the average percentage of amounts distributed in the form of government taxes.

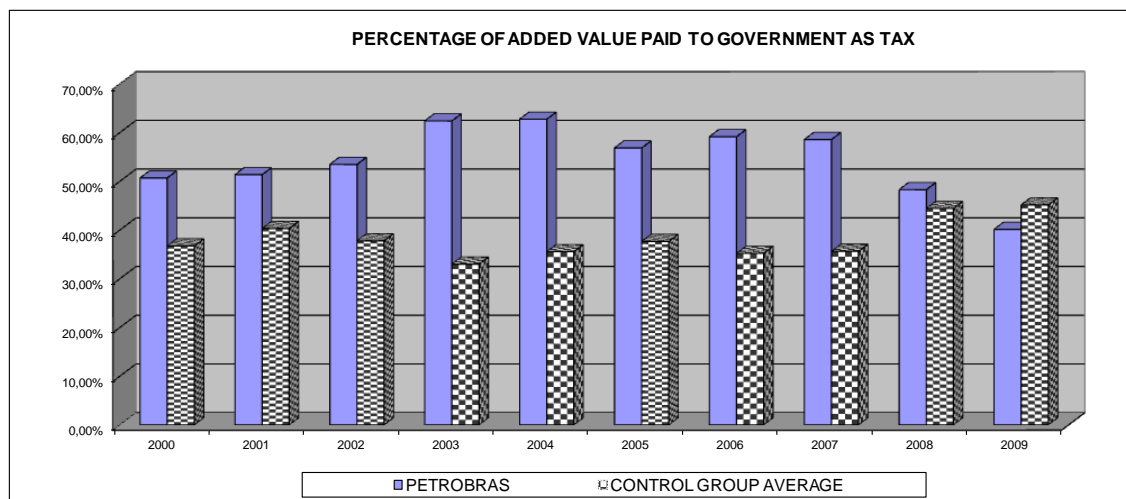


Figure 3 - Percentage of added value paid as government taxes.

Santos (2007), explains that one of the advantages of DVA data is the possibility of knowing all taxes incurred by the company's operation. The survey reveals that the average tax percentage presented by Petrobras is higher than the average presented by the control group, considering that Petrobras case is compatible with the companies that had the highest percentages in this item. Petrobras presents an average percentage similar to energy companies, the cigarettes industry, the beverages industry and cosmetics.

Table 3 presents the results of the statistical tests for the mean values paid as government taxes.

PERCENTAGE OF ADDED VALUE PAID TO GOVERNMENT AS TAXES	
H0 : $\mu$ Petrobras = $\mu$ Control group	
H1 : $\mu$ Petrobras > $\mu$ Control group	
AVERAGE RESULTS	
Petrobras	Control group
54,36%	35,03%
Mann-Whitney U test	
p-value (two-tail).....	0,004
Kolmogorov-Smirnov test	
p-value (two-tail).....	0,002

Table 3 - Percentage of added value paid as government taxes statistic test.

As we can observe in Table 3, the average calculated for Petrobras (54.36%) is higher than the average for the control group (35.03%); We also observed that the values of the p-values for the Mann-Whitney and Kolmogorov-Smirnov tests suggest that the rejection of the null hypothesis is smaller than the confidence level of 5%, thus outside of the acceptance area for the equality of means hypothesis. We conclude that Petrobras, on average, has a higher tax burden than the average of the control group. This difference is based on the tax legislation applicable to the extraction and refining petroleum industry. One remarkable fact is that Petrobras has decreased its tax burden compared to the average tax burden of the control group over the analysis period.

The average percentage of added value distributed as interest payments to lenders is shown in Figure 4.

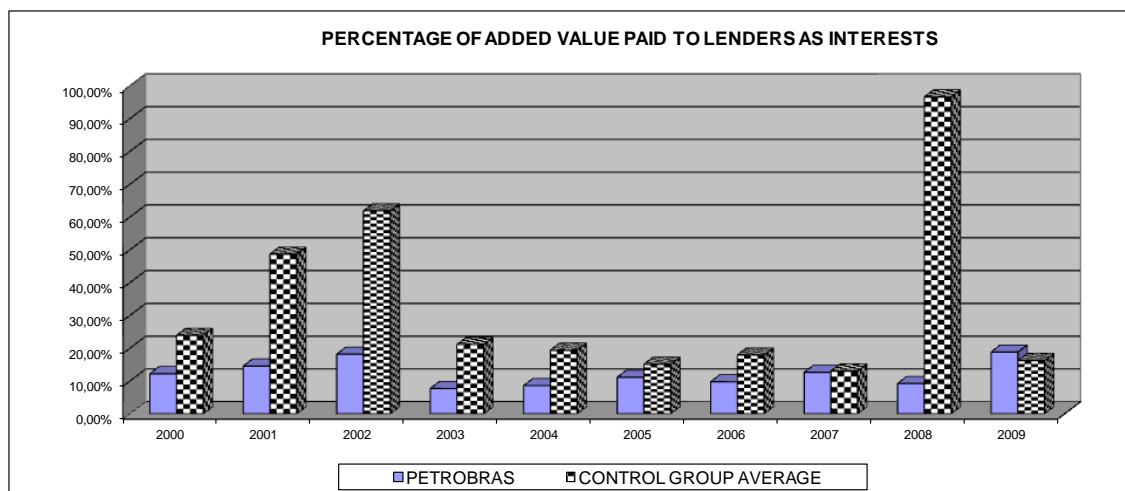


Figure 4 - Percentage of added value distributed as interest payment to lenders.

Table 4 shows the results of statistical tests to the average added value distributed as interests.

PERCENTAGE OF ADDED VALUE PAID TO LENDERS AS INTEREST	
H0 : $\mu$ Petrobras = $\mu$ Control group	
H1 : $\mu$ Petrobras < $\mu$ Control group	
AVERAGE RESULTS	
Petrobras	Control group
12,29%	29,86%
Mann-Whitney U test	
p-value (two-tail).....	0,179
Kolmogorov-Smirnov test	
p-value (two-tail).....	0,044

Table 4. Percentage of added value distributed as interest payments to lenders statistic test.

The results average indicate a lower percentage for Petrobras (12.29%) and the p-values indicate that the null hypothesis should be accepted, that is, statistics indicate that there is evidence that the mean percentage of added value distributed as interest payment for both Petrobras and the control group are similar, that is, the difference presented, 12.29% to 29.86% for Petrobras and the control group cannot be considered statistically significant.

The added value paid as dividends to shareholders can be seen in Figure 5.

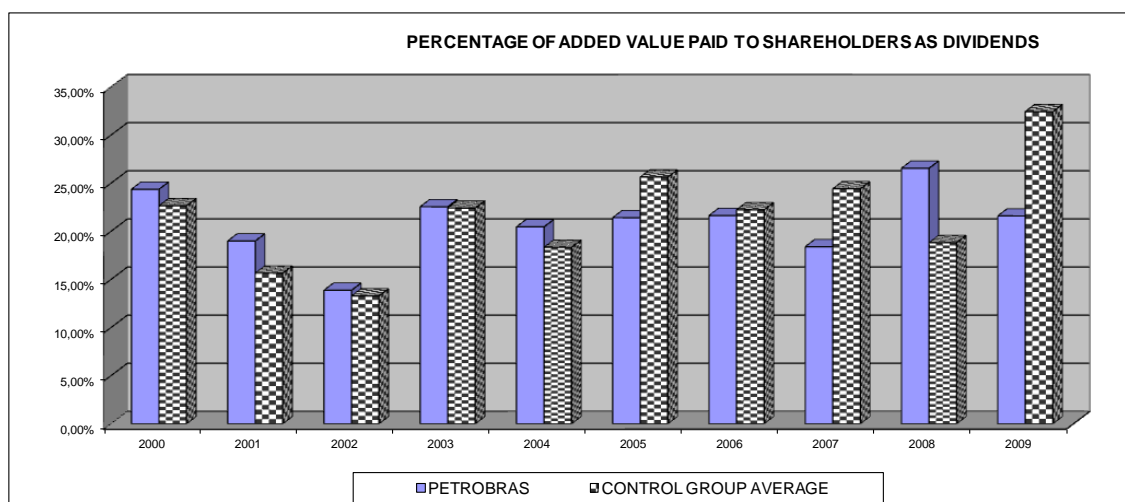


Figure 5. Percentage of added value paid as dividends to shareholders.



The results of the statistical tests are shown in Table 5, in which it can be noted that the p-values suggest the acceptance of the null hypothesis because they are higher than the level of assurance of 5% presenting no statistically significant differences.

PERCENTAGE OF ADDED VALUE PAID TO SHAREHOLDERS AS DIVIDEND	
H0 : $\mu$ Petrobras = $\mu$ Control group	
H1 : $\mu$ Petrobras < $\mu$ Control group	
AVERAGE RESULTS	
Petrobras	Control group
20,99%	21,67%
Mann-Whitney U test	
p-value (two-tail).....	0,507
Kolmogorov-Smirnov test	
p-value (two-tail).....	0,157

Table 5. Percentage of added value paid as dividends to shareholders statistic test.

Figure 6 shows the average percentage of added value received in transfers by Petrobras and the average percentage received by the control group.

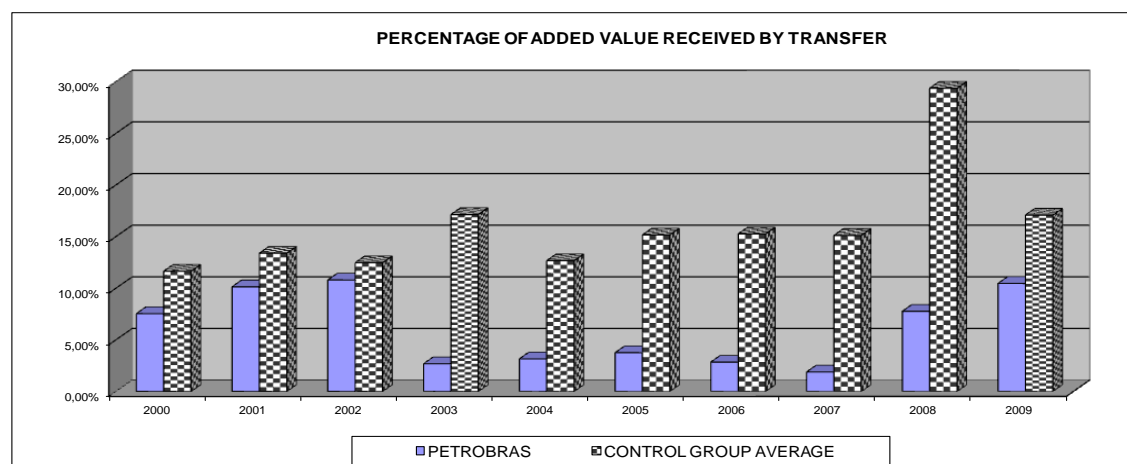


Figure 6. Percentage of added value received by transfer.

Statistical tests for the means of the added value received in transfers are shown in Table 5.

The significance tests suggest the rejection of the null hypothesis because they are smaller than the confidence level of 5%. The evidence suggests that Petrobras received less added value in transfers than the companies in the control group.

PERCENTAGE OF ADDED VALUE RECEIVED BY TRANSFER	
H0 : $\mu$ Petrobras = $\mu$ Control group	
H1 : $\mu$ Petrobras < $\mu$ Control group	
AVERAGE RESULTS	
Petrobras	Control group
6,10%	16,41%
Mann-Whitney U test	
p-value (two-tail).....	0,004
Kolmogorov-Smirnov test	
p-value (two-tail).....	0,008

Table 6. Percentage of added value received in transfers statistic test.

Figure 7 is an attempt to join a view of the average percentage for each added value distribution category.

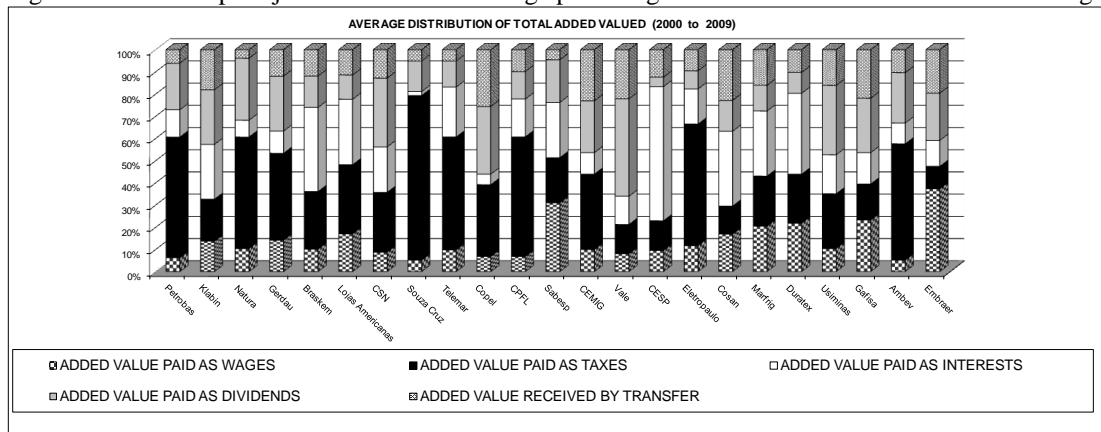


Figure 7. View of average percentage for each company in the sample.

### 5.2 Potential Wealth creation indicator analysis

Another issue included in this study was the use of DVA data as an analytical tool for wealth creation potential. Initially, we analyzed the asset potential to generate wealth. This ratio measures how much each dollar invested in assets contributes to the generation of added value, which will then be distributed by the company, Luca [et al] (2009). Note that on Figure 8 this indicator was higher for Petrobras than for the control group in all the years analyzed. Also, note that this indicator shows a decrease trend from the year 2005 for both Petrobras and the control group.

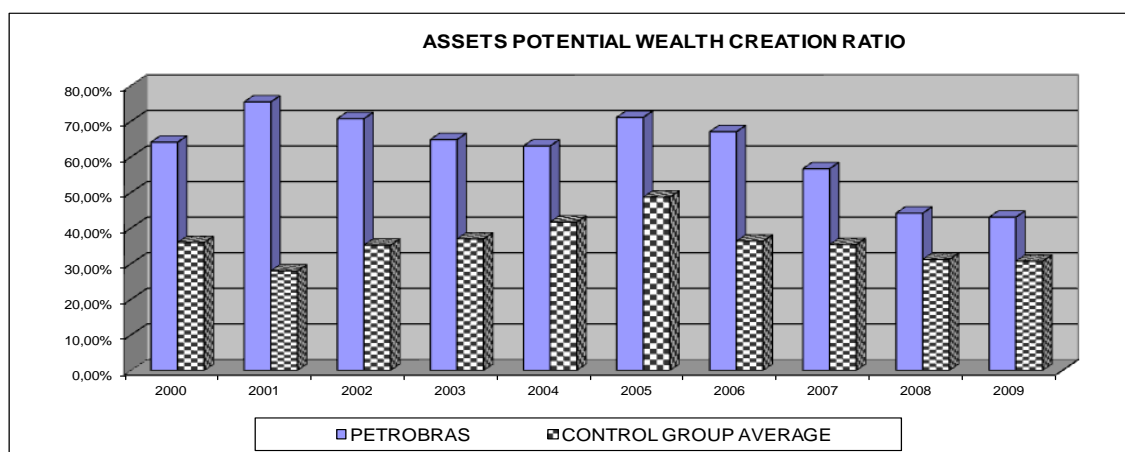


Figure 8. Assets potential wealth creation ratio.

When we analyze the average of this indicator through confidence statistical tests, which are shown in Table 6, we observe that Petrobras (0.62) is higher than the control group (0.41), and p-values in both Mann-Whitney and Kolmogorov-Smirnov tests suggest null hypothesis rejection, That is, it suggests that there is enough evidence to conclude that the potential wealth creation for Petrobras assets is greater than for companies in the control group.

ASSETS POTENTIAL WEALTH CREATION RATIO	
H0 : $\mu$ Petrobras = $\mu$ Control group	
H1 : $\mu$ Petrobras > $\mu$ Control group	
AVERAGE RESULTS	
Petrobras	Control group
0,62	0,41
Mann-Whitney U test	
p-value (two-tail).....	0,000
Kolmogorov-Smirnov test	
p-value (two-tail).....	0,000

Table 6. Assets potential wealth creation ratio statistic test.

The potential sales to generate wealth was another indicator that we have analyzed. This indicator is obtained by dividing the added value by the total value of sales. Santos (2007), explains that this ratio can be called sales productivity and it indicates how each dollar sold has turned into wealth. One important detail to be noticed is that the DVA item used in this calculation. In the calculation of this ratio, we must use the added value produced by the company (Item 5 of the CPC model). This question relates to the understanding that the total added value for distribution (Item 7 of the CPC model) contains the portion of the added value that the company received on transferred from other companies and it was not generated by their own sales effort, which does not happen when using the added value generated by the company.

Figure 9 shows the results of this ratio for Petrobras and the control group.

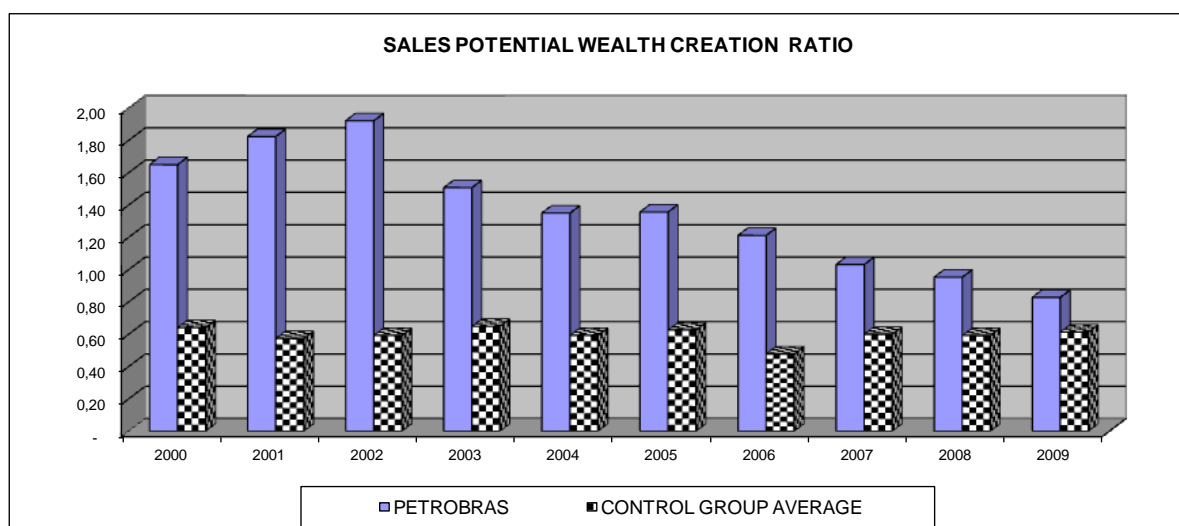


Figure 9. Sales potential wealth creation ratio.

The average ratio indicates that Petrobras achieved a higher average (0.74) than the control group average (0.54), suggesting that Petrobras' sales have a higher potential than the other companies do to generate wealth. The statistical tests, Mann-Whitney and Kolmogorov-Smirnov, indicate values outside the acceptance area of the null hypothesis for equality means, indicating statistical evidence that, in fact, the average of Petrobras is higher than the control group for this ratio.

SALES POTENTIAL WEALTH CREATION RATIO	
H0 : $\mu$ Petrobras = $\mu$ Control group	
H1 : $\mu$ Petrobras > $\mu$ Control group	
AVERAGE RESULTS	
Petrobras	Control group
0,74	0,59
Mann-Whitney U test	
p-value (two-tail).....	0,005
Kolmogorov-Smirnov test	
p-value (two-tail).....	0,000

Table 7. Sales potential wealth creation ratio statistic test.

Another wealth generation indicator is the potential of shareholders' equity to generate wealth. This ratio is obtained by dividing the added value generated by the company during the period by the amount of shareholders' company equity. This ratio indicates how the company distributes each dollar of equity-generated wealth, Luca et al. (2009).

In Figure 10 we can see the relationship between Equity and the added value of Petrobras and the control group.

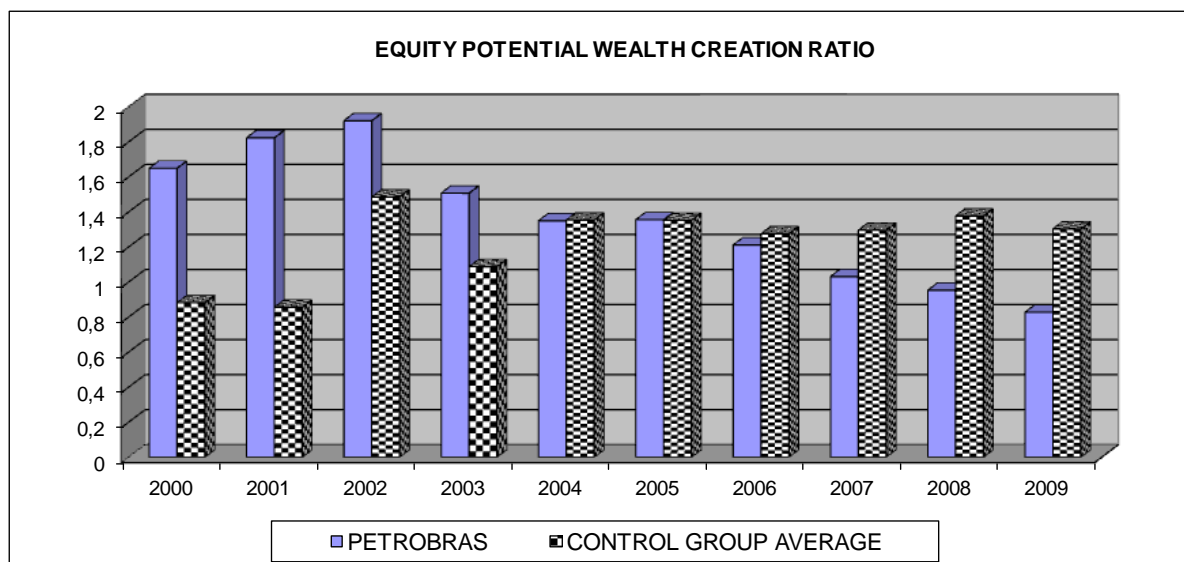


Figure 10. Shareholders' equity potential wealth creation ratio.

Statistical tests for this ratio indicate, by the values of p-values, that there is evidence that the levels for Petrobras are higher than the levels of other companies in the control group.

EQUITY POTENTIAL WEALTH CREATION RATIO	
H0 : $\mu$ Petrobras = $\mu$ Control group	
H1 : $\mu$ Petrobras > $\mu$ Control group	
AVERAGE RESULTS	
Petrobras	Control group
1,36	1,18
Mann-Whitney U test	
p-value (two-tail).....	0,025
Kolmogorov-Smirnov test	
p-value (two-tail).....	0,014

Table 8. Shareholders' equity potential wealth CREATION statistic test.

### CONCLUSION

This study was based on the analysis of 23 Brazilian companies DVA data, which led to the confirmation of the effectiveness of DVA in the production of information that can be used to help understand the role of economic agents in the generation of wealth as well as their socio-economic role by the distribution of the wealth generated. We consider that the results show that the issue raised in the introduction of this paper has been addressed.

The core of the study is an exploratory research that aimed at analyzing the generation and distribution of wealth by only one company compared to other companies belonging to different sectors and, therefore, Petrobras was chosen as a benchmark because of its importance in generating wealth for the country. The data obtained from Petrobras DVA were compared with the same data from other 22 (twenty-two) Brazilian companies over a period of ten years, from 2000 to 2009.

The values used from statements of added value in each year were:

- Added value paid by wages and contributions (salary, benefits, etc.);
- Added value paid to government by taxes (Federal, State and City);
- Added value paid to lenders by interests and other payments (interest, rents, royalties, etc.);
- Added value paid to shareholders by dividends and other payments (interest on capital, dividends);
- Added value received in transfers (interest, rents, royalties, etc.).

Additionally, three ratios that indicate the potential for wealth generation were calculated:

- Assets potential Wealth creation ratio (added value divided by assets);
- Sales potential to generate wealth ratio (added value divided by sales);
- Shareholders' equity potential to generate wealth ratio (added value divided by shareholders' equity).

Nonparametric tests for means of two independent samples were calculated. The test results are shown in Table 9.

YEAR 2000 to 2009		PETROBRAS	CONTROL GROUP
PERCENTAGE OF ADDED VALUE PAID TO EMPLOYEES AS WAGES	AVERAGES	6,25%	16,48%
	p-value	0,002	
	conclusion	LOWER	HIGHER
PERCENTAGE OF ADDED VALUE PAID TO GOVERNMENT AS TAX	AVERAGES	54,36%	35,03%
	p-value	0,004	
	conclusion	HIGHER	LOWER
PERCENTAGE OF ADDED VALUE PAID TO LENDERS AS INTERESTS	AVERAGES	12,29%	29,86%
	p-value	0,179	
	conclusion	NO DIFFERENCES	
PERCENTAGE OF ADDED VALUE PAID TO SHAREHOLDERS AS DIVIDENDS	AVERAGES	20,99%	21,67%
	p-value	0,507	
	conclusion	NO DIFFERENCES	
PERCENTAGE OF ADDED VALUE RECEIVED BY TRANSFER	AVERAGES	6,10%	16,41%
	p-value	0,004	
	conclusion	LOWER	HIGHER
ASSETS POTENTIAL WEALTH CREATION RATIO	AVERAGES	0,74	0,59
	p-value	0,000	
	conclusion	HIGHER	LOWER
SALES POTENTIAL WEALTH CREATION RATIO	AVERAGES	0,62	0,41
	p-value	0,005	
	conclusion	HIGHER	LOWER
EQUITY POTENTIAL WEALTH CREATION RATIO	AVERAGES	1,36	1,18
	p-value	0,025	
	conclusion	HIGHER	LOWER

Table 9. Summary of statistic test results between Petrobras and Control group of companies.

Initially we can conclude that the generation and distribution of wealth presented by Petrobras in almost all indicators is significantly different from the control group average.

Considering that this study did not take into account every business sector, the findings revealed that there are statistical evidence to conclude that one of the characteristics of Petrobras is the smallest distribution of value added as wages. It is important to mention that the tests were performed with the mean value of the total wages paid regardless of the number of employees in each period.

The tests also indicated that another feature of Petrobras is the distribution of a higher share of added value to governments in the form of taxes. This fact leads us to the understanding that Petrobras supports higher taxation than the average of the control group, only comparable to the level of electrical companies and superfluous products manufacturers (see Table 6). This is due to specific federal, state and local taxes.

For the added value paid as interest to lenders the average tests showed evidence that the means of Petrobras are the same as those for the control group. In addition, for the added value paid to shareholders as dividends the tests showed no significant differences, with results being higher than 5%, which suggests that the average for Petrobras is similar to the control group.

The added value received in transfers, which represent values that were generated by other entities, showed evidence that they are lower for Petrobras in comparison to the control group with the p-value of the Mann-Whitney test equal to 0.004.

The analysis of wealth generation potential ratios, assets, sales and potential equity indicated that Petrobras has a greater potential than the control group shown by the average of the three ratios. Statistical tests corroborate this conclusion presenting p-value values smaller than 5% in all three cases.

After completing the analysis, we concluded that Petrobras has significant differences in the distribution of wealth generated in relation to the group of companies, which were taken as a parameter for analysis without taking into account each company that these companies belong to.

These results do not end the discussion over the issue of generation and distribution of wealth among companies from different sectors. Therefore, we recommend that other authors consider the possibility of implementing other analyzes with other spanning other periods and taking into account other statistical tests in order to further evaluate the results of this work.

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