

Research Article

The Steel Industry in Global Competition and Limited Capital: A Case Study of the Steel Industry in Bolivia

Antonio Rafael da Riga

Universidad Mayor de San Simón, Cochabamba, Bolivia

Email: rafaeldariga@gmail.com

Academic Editor: Nguyen Ngoc Anh

Copyright © 2023 Antonio Rafael da Riga. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract. This article has as its objective to present a study of the impact of tax costs of the investment destined to the expansion of a metallurgical plant in Bolivia, compared with the tax load that would occur if such the investment were made in other countries, specifically, the USA, Canada and Chile. The study has been developed within the context of recognition that certain events which provoke effects upon the level of competitiveness of companies are beyond their action range. Among such events, the tax load, an integral element of government macroeconomic policies, has been considered in this study. The multiple case study method was used to measure the tax cost of a planned investment, contemplating the effective legislation in each of the examined countries. Results of the study allow concluding that, among the four countries under analysis, Brazil presents the largest tax cost, significantly greater than the other countries, which offer fiscal incentives, including a negative tax load. Among the remaining three countries, the company competitiveness has been favoured according to the following order: by Chile, the USA and Canada.

Keywords: *Capital goods, Tax cost, Competitiveness.*

A. INTRODUCTION

Tax management in Bolivia has been characterized by its complexity, given the proliferation of taxes, their interrelationships, autonomy at government levels (federal, state, municipal), use of incentives in government plans, frequent changes in legal texts, etc. In the scope of federal taxes, particularly income tax, Social Contribution on Net Income (CSLL), Social Integration Program (PIS) and Contribution for Social Purposes (COFINS), de Freitas et al. (2021) makes a broad approach on the subject.

In addition to these aspects, the Bolivian tax system also contains devices that affect the development and expansion of certain productive activities. Tax distortions affect and undermine investment decisions, inhibiting production growth and job offers. Part of the taxes is of a cumulative nature, and fall in cascade in the various stages of the production process, such as COFINS and PIS, which, together, represent a significant portion of the total tax burden. Nevertheless, the federal government has been increasing the rates of these taxes de Carvalho et al., 2016).

Thus, when the Government institutes or increases a cumulative tax levied on sales in general, the tendency is for the competitiveness of national producers in relation to their foreign competitors to be reduced. This fact leads to an increase in the so-called “Bolivia Cost” (Llopis et al., 2018).

It should be noted that the surcharge on investments in capital goods, the main theme of this article, is also a factor of distortion of the tax burden, as in addition to increasing the price of products, it hinders the creation of jobs and the country's economic and social development. The high tax burden on capital investments has been pointed out as a

discouraging factor for investments in Bolivia, often causing investors to opt for other countries when investing.

Regarding the tax costs of custom capital goods and their relationship with competitiveness, the objective of this work is to demonstrate how institutional and regulatory policies can contribute, or not, to stimulate the infrastructure sectors, especially, the base industry (da Silva et al., 2020). Despite the fact that Bolivian legislation undergoes frequent changes, the intention is to call the attention of companies and the government regarding the tax cost on capital goods acquired on demand, as a strategic option for reducing costs. It should be noted that, except in the case of Bolivia, the tax costs incurred in the other countries surveyed were treated in a generic way, not representing an in-depth analysis of the specific rates used in each of them (Berolucci & Nascimeto, 2006).

The contribution and relevance of this study are directly related to enabling the debate on the search for competitiveness by companies as a way to ensure their continuity. Another feature that also distinguishes this research is its study focus. In fact, when dealing with the fiscal-tax cost, as a competitiveness factor, the study contributes with the evidence that, in order to be achieved, it needs government action as an agent of the country's competitiveness.

In the current international context, the competitive environment in which companies are inserted presents constant changes. In this context, to remain in the market, organizations must react quickly to changes in technological, economic and political conditions, as well as continuously expand their capacity to innovate and modernize, aiming at a better strategic positioning in the face of what can be called competitive model (Prudencio et al., 2011).

In this same sense, Koch et al. (2020) and Junior & Martinez (2020) infer that “the increase in competition has been causing profound changes in the productive systems of companies. The trend of these modifications can be seen by comparing the production system of a modern company with that of a traditional company”. From this comparison, it is denoted that continuous improvement has become an incessant search for improving efficiency and productivity, which demands a series of decisions to be taken by managers, such as, for example, the renovation or expansion of the industrial park.

This finding, however, leads to the issue of tax costs, since, in this context, a transformation in the focus of strategic cost management is noted. Companies also began to focus on tax costs, and not only on (internal) operating costs, as has traditionally been the case. This transformation stems from the fierce competition in the market, which requires managers to pay special attention to tax costs as a relevant factor in the competitive position of companies. This ends up defining the competitive position of companies today, especially in the international arena.

Nabais (2019) and Fernandes (2010) understand that competitiveness is the result of several factors that interfere in business activities, whether systemic, structural or internal. Systemic factors are related to all macroeconomic, political-institutional, political-regulatory components, among others, that can impact the performance of companies.

Structural factors correspond to the set of specific conditions of the environment in which the company operates, such as the market and industrial organization. Finally, internal factors are all those elements internal to the company that make it competitive or not, such as industrial management and technological innovation. The first two sets of factors encompass conditions external to the business organization, in which the possibilities of changing the company's competitive strategy may occur through the involvement of industry associations and federations.

Traditionally, it has been understood that Systemic Factors were outside the company's field of action. Currently, however, it is noted that more and more companies, through associations and federations representing the sector, have sought greater interaction with

government bodies, thus generating what can be called mutual influence. Thus, if on the one hand companies expect better institutional and regulatory policies in terms of taxation on investments in capital goods, on the other hand, the government hopes, with such policies, to attract investments aimed at the country's economic development.

This fact is corroborated by the measures taken by the Bolivian federal government within the scope of the Special Regime for the Acquisition of Capital Goods for Exporting Companies (RECAP), which is presented as a tax exemption program for investments in capital goods of companies that export more than 80 % of your production.

Therefore, it becomes part of a set of public policies, such as RECAP, for example, which advocates, according to the Ministry of Industry Development and Foreign Trade Pohlmann et al. (2010), that “some industrial projects, still under study, are already strong candidates to be contemplated by the new measure of the Government”. Among them, enterprises in the steel and paper and cellulose sectors stand out, whose investments already point to resources in the order of US\$ 10 billion, which should generate foreign exchange of more than US\$ 3 billion annually.

It can be inferred, therefore, that currently the conjectures around competitiveness must take into account, in addition to the internal factors of organizations with regard to investment decisions, systemic factors, particularly public policies that affect corporations. In other words, there is no more space to treat competitiveness exclusively in the internal environment of companies.

From this perspective, investment decisions in capital goods stand out, which notably translate into competitive advantages, such as: technological advances, social and economic changes (Dalmolin, 2021; Castala et al., 2014).

B. METHOD

The present study has a quantitative and qualitative character and used the method of multiple case studies. This method is characterized as an empirical investigation that investigates a contemporary phenomenon within its real-life context (YIN, 2001). Multiple case studies are appropriate when the research objective is descriptive, theory building, or theory testing. In addition, multiple case studies allow for cross-case analysis and theory extension, yielding more general research results.

Data collection was carried out through documents and technical reports provided by the engineering departments of companies affiliated with the Bolivian Institute of Steelmaking (IBS), whose corporate name will not be declined (Machado & Nakao, 2012).

From the analysis of the aforementioned documentation, two similar investment projects were selected for the assembly of the studied model, which have already been installed in companies affiliated with the IBS. The analysis of the results was carried out with a quantitative and qualitative approach and occurred through the comparison of the data obtained with each other and their interpretation in light of the theory and current tax legislation.

C. RESULT AND DISCUSSION

The study demonstrates a way of measuring the collection of taxes on investment in capital goods by order which, impelled by the public power, burdens the costs of companies in Bolivia, resulting in a loss of competitiveness, especially when comparing with other countries.

In addition, it also demonstrates the harmful effect that tax policy can have on the Bolivian economy, since, in addition to sharply reducing the chances of productive investments, it inhibits job creation and the country's economic and social development.

Premises Adopted for the Study

Based on the established assumptions, for the purposes of the study, only the amount of taxes levied on the acquisition of goods and services carried out during the period of construction of the new unit until the moment of its entry into operation was taken into account (PRICEWATERHOUSECOOPERS, 2004). At this point, given the complexity of the Bolivian legal and tax system, as well as the variety of goods and services acquired or contracted for an investment of this magnitude, the rates that are usually practiced in the steel industry were adopted as a standard, which are presented in Table 1.

Table 1. Taxes and Rates

Taxes	Percentage
COFINS	7.60%
PIS	1.65%
CPMF	0.38%
ICMS	18.00%
Import tax	14.00%
IPI Electric/Electronic Equipment	15.00%
IPI Mechanical Equipment	5.00%
Taxes on payments abroad	20.00%
IRPJ e CSL	34.00%
ISS	4.00%

In order to allocate the amount invested in each stage of the project and, consequently, to determine the basis for calculating the taxes involved in said acquisitions, in addition to the budget for the implementation project of the new unit, technical reports provided by the engineering departments were used of companies affiliated to IBS. To assemble the studied model, two similar investment projects that have already been installed were selected.

Analysis of the Tax Burden on Steel Investment

From the application of the assumptions referred to in item 4.1, the tax burden incident on the implementation of a new steel plant in Bolivia was determined. The data are shown in Table 2, which presents the project divided into two large groups: one for investments in equipment and the other for the provision of services. With regard to expenses, a division was made between the national and international scopes.

With regard to taxes levied in Bolivia, it should be noted that financial adjustments were made in relation to ICMS, PIS and COFINS tax credits on acquisitions for fixed assets, in order to bring them to present value. This adjustment was necessary due to the fact that, although such credits originate from the collection of these taxes at the time of acquisition of the assets, their use is deferred, by express provision in Bolivian legislation for the moment in which the investment begins to operate.

As a discount rate for calculating said present value, shown in the “Credits” column of Table 2, the percentage of 16% was used, which represents the average annual rate of SELIC, the index used by the Federal Government to update credits tax. The two-year period for setting up the plant and starting operations was also taken into account.

In Bolivia, companies are subject to several taxes, including corporate income tax, value-added tax (VAT), withholding tax, and municipal taxes. Corporate income tax is levied on the company's net income at a rate of 25%. VAT is imposed on the value added to goods and services, typically at a rate of 13%. Withholding tax is levied on certain types of payments made to non-residents at a rate of 12.5% to 25%. Municipal taxes are assessed on property and vary by location.

The tax burden on steel investment in Bolivia could depend on several factors, including the size and scope of the investment, the location of the investment, and any incentives or exemptions offered by the government. Bolivia may have specific tax incentives or exemptions for investments in the steel industry, which could reduce the tax burden for companies. Additionally, the tax burden could be affected by any bilateral investment treaties or free trade agreements between Bolivia and other countries.

It's important to note that tax laws and policies can change over time, and the tax burden on steel investment in Bolivia could be different today than it was in the past or will be in the future. Companies considering steel investment in Bolivia should consult with tax experts and legal advisors to understand the current tax laws and potential tax implications.

In addition to the types of taxes and factors that could affect the tax burden on steel investment in Bolivia, there are some other considerations to keep in mind:

1. **Political stability:** The political situation in Bolivia can affect the investment climate and tax policies. Any political instability, changes in leadership, or shifts in policy priorities could impact the tax burden on steel investment.
2. **Infrastructure:** The availability and quality of infrastructure, such as transportation, energy, and telecommunications, can affect the cost of doing business and, consequently, the tax burden.
3. **Labor costs:** The cost of labor in Bolivia can vary depending on the industry and location. Companies considering steel investment should factor in labor costs, as they could affect the overall cost structure and, in turn, the tax burden.
4. **Regulatory environment:** The regulatory environment in Bolivia can impact the ease of doing business and the tax burden. Companies should be aware of the regulatory requirements for steel investment and any potential regulatory hurdles that could increase costs and affect the tax burden.
5. **Market demand:** The demand for steel in Bolivia and the surrounding region could affect the profitability of the investment and, therefore, the tax burden. Companies should consider the market demand for steel products before investing in the industry.

Overall, while tax burden is an important consideration for steel investment in Bolivia, it is only one factor among many that companies should consider when making investment decisions. Companies should conduct comprehensive due diligence and consider a range of factors before investing in the steel industry in Bolivia.

Comparison with Other Countries

With regard to Chile, its choice aimed to verify how a Mercosur partner treats investments in capital goods. It should be noted that, except in the case of Bolivia, the tax costs incurred in the other countries surveyed were treated in a generic way, not representing, therefore, an in-depth analysis of the specific rates used in each country. This limitation resides in the fact that for each state and/or municipality of the countries used for comparison, there is a different tax legislation. Thus, in Table 4, the average state rates for each country were used.

Thus, for the purposes of comparison with the tax burden levied in the aforementioned countries, the same operations used to identify and determine the tax burden levied in Bolivia are considered to determine the basis for calculating the taxes involved.

It can be seen from the analysis of that, in the USA and Chile, both federal and state taxes allow the taxpayer to recover, by taking tax credits for the amounts paid in the acquisition of goods or services, so that there is no immediate tax impact. In Canada, there is a tax burden of 4.88% of the total expenses necessary for the implementation of a new steel plant. Additionally, in the comparative tables of taxation between countries, the effect that the incentive of accelerated depreciation represents in terms of income tax savings, since such

benefit is conferred in the US, Canada and Chile for the implementation of investments in the steel industry (Paes, 2017).

The steel industry is a global industry, with countries around the world producing and consuming steel. There are several factors that can be used to compare countries in the steel industry, including production capacity, output, consumption, trade, and technological advancements. Production capacity refers to a country's ability to produce steel, and it can be measured in terms of annual production capacity. China is currently the largest producer of steel in the world, with an annual production capacity of over 1 billion metric tons. Other major steel producers include India, Japan, the United States, and Russia (Pulido, 2016).

Output refers to the actual production of steel, measured in terms of annual production. Again, China is the world's largest producer of steel, followed by India, Japan, and the United States. However, the distribution of output varies by region, with Asia accounting for a significant share of global steel output. Consumption refers to the use of steel within a country and can be measured in terms of annual consumption. China is also the world's largest consumer of steel, followed by the United States, India, and Japan. The level of consumption can be influenced by several factors, including economic growth, infrastructure development, and construction activity (Dakua, 2019).

Trade refers to the import and export of steel between countries. Some countries, such as China, are net exporters of steel, meaning they export more steel than they import. Other countries, such as the United States, are net importers of steel, meaning they import more steel than they export. Trade in the steel industry can be affected by trade policies, such as tariffs and quotas.

Technological advancements refer to the level of innovation and technology adoption in the steel industry. Some countries have advanced steel production technologies, such as electric arc furnaces and continuous casting, which can increase efficiency and reduce costs. Others may have older, less efficient production technologies. In summary, the comparison of countries in the steel industry involves several factors, including production capacity, output, consumption, trade, and technological advancements. These factors can vary significantly by country and can be influenced by a range of economic, political, and technological factors.

In addition to the factors mentioned above, there are other ways to compare countries in the steel industry, including:

1. **Cost of production:** The cost of producing steel can vary by country due to differences in labor costs, energy costs, and raw material prices. Some countries may have a competitive advantage in steel production due to lower costs of production.
2. **Environmental regulations:** The steel industry is a major contributor to greenhouse gas emissions and other forms of pollution. Countries with stricter environmental regulations may impose higher costs on steel producers, which could affect the competitiveness of their steel industry.
3. **Industry structure:** The steel industry can be highly concentrated, with a few large producers dominating the market. Some countries may have a more diversified industry structure, with many smaller producers.
4. **Supply chain integration:** The steel industry is part of a complex global supply chain that includes raw material suppliers, transportation providers, and end-users. Countries with well-integrated supply chains may have a competitive advantage in the steel industry.
5. **Innovation and research:** Countries that invest in research and development in the steel industry may develop new technologies or processes that increase efficiency and reduce costs.

Overall, the comparison of countries in the steel industry is complex and involves many factors. Different countries may have different strengths and weaknesses in the steel industry, depending on their natural resources, economic policies, technological capabilities, and other factors. Understanding these factors is essential for companies considering investments in the steel industry and policymakers looking to promote economic growth and development in their countries.

South Korea is one of the world's largest producers and exporters of steel, with a strong and competitive steel industry. The country has a long history in the steel industry and has developed advanced technologies and processes for steel production.

In terms of production capacity, South Korea ranks as the fifth-largest steel producer in the world, with an annual production capacity of around 78 million metric tons. The country's steel output is dominated by two major steelmakers: POSCO and Hyundai Steel. South Korea is also a major exporter of steel, with exports accounting for more than half of the country's total steel production. The country's main export markets include China, Vietnam, and the United States.

One factor that has contributed to South Korea's success in the steel industry is its focus on technology and innovation. The country has developed advanced steel production technologies, such as electric arc furnaces and continuous casting, that have increased efficiency and reduced costs. South Korean steel companies have also invested in research and development, resulting in new products and technologies that have helped the industry remain competitive.

Another factor that has contributed to South Korea's success in the steel industry is its close integration with other sectors of the economy. The country has a well-developed supply chain for steel production, with a strong domestic network of raw material suppliers, transportation providers, and end-users. This integration has helped South Korea's steel industry remain competitive and efficient. In recent years, South Korea's steel industry has faced challenges from increasing competition from China and other countries, as well as rising raw material costs and environmental regulations. However, the industry has continued to adapt and innovate, and South Korean steelmakers remain major players in the global steel industry.

Brazil is one of the world's leading steel producers, with a strong and competitive steel industry. The country has abundant natural resources, including iron ore and coal, which are essential inputs for steel production.

In terms of production capacity, Brazil ranks as the ninth-largest steel producer in the world, with an annual production capacity of around 34 million metric tons. The country's steel industry is dominated by a few large steelmakers, including ArcelorMittal, Gerdau, and Usiminas. Brazil is also a major exporter of steel, with exports accounting for more than a quarter of the country's total steel production. The country's main export markets include the United States, Mexico, and Argentina.

One factor that has contributed to Brazil's success in the steel industry is its natural resources. The country has large reserves of high-quality iron ore and coking coal, which are essential inputs for steel production. Brazil's steel industry has also benefited from the government's support for infrastructure development and investment in the sector. Another factor that has contributed to Brazil's success in the steel industry is its focus on sustainability. The country's steel industry has made significant progress in reducing its environmental impact, with improvements in energy efficiency, emissions reduction, and waste management. The industry has also invested in research and development, resulting in new technologies and processes that have increased efficiency and reduced costs.

However, the steel industry in Brazil has faced challenges in recent years, including rising costs of raw materials and energy, as well as competition from other countries.

Additionally, the COVID-19 pandemic has had a significant impact on the industry, leading to lower demand and production levels. Nonetheless, the industry has continued to adapt and innovate, and Brazil remains a major player in the global steel industry.

D. CONCLUSION

As demonstrated, competitiveness results from a synergy between government policies, investments in infrastructure, technological innovation and, above all, business resourcefulness in the foreign market. In this sense, it appears that the business community recognizes that the foundations of competitiveness are supported by competitive dynamics, that is, that they are based on the skills of practicing the competitive strategies required by the standards of a globalized economy beyond the internal environment of organizations.

It is noted that the option to exempt capital investments is a broader strategic decision at the government level, becoming a factor of attraction for an industrial policy of sustained growth in the country, aiming to make the economy expand, raise the level of employment and income. The data from this study reaffirm that competitiveness at the domestic and international level is inevitably influenced, in this aspect, more by taxes than by business management. However, tax policy is conditioned to the sovereignty of countries, their institutional and regulatory policies.

REFERENCES

1. Banerjee, A., & De, A. (2014). Determinants of Corporate Financial Performance Relating to Capital Structure Decisions in Indian Iron and Steel Industry: An Empirical Study. *Paradigm*, 18(1), 35-50.
2. Bertolucci, A. V., & Nascimento, D. T. D. (2006). The cost of federal taxation. *Revista Contabilidade & Finanças*, 17, 36-50.
3. Casalta Nabais, J., & Lavouras, M. M. (2014). The Financial Transactions Tax. *Boletim Ciências Economicas*, 57, 2455.
4. da Silva, B. S., De Carvalho, O. A., Pinheiro, L. E. T., & Francisco, J. R. D. S. (2020). Effect of Tax Incentives on the Generation and Distribution of Wealth of Brazilian Publicly Traded Companies/Efeito dos Incentivos Fiscais na Geracao e Distribuicao de Riqueza das Companhias De Capital Aberto Brasileiras. *Revista de Contabilidade e Controladoria*, 12(1), 63-84.
5. Dakua, S. (2019). Effect of Determinants on Financial Leverage in Indian Steel Industry: A Study on Capital Structure. *International Journal of Finance & Economics*, 24(1), 427-436.
6. Dalmolin, L. C. (2021). Hidden sides of the capitalist tax structure. *Economia e Sociedade*, 30, 1051-1068.
7. de Carvalho, T. M., de Lima, P. F., & Thome, K. M. (2015). Economic Analysis of Taxes in Agribusiness: Production Cost or Transaction Cost. *CEP*, 70, 550.
8. de Freitas, H. B. M., Moreira, C. S., da Silva, A. R. P., do Nascimento, Í. C. S., & de Melo, G. C. V. (2021). Tax management: analysis of the influence on the equity cost of Brazilian companies. *Revista Ambiente Contábil-Universidade Federal do Rio Grande do Norte-ISSN 2176-9036*, 13(2).
9. Fernandes, F. A. D., Teixeira, A., & Baptista, É. C. (2010). Brazil's COFINS Tax: An Empirical Study of the Change in the Calculation Rules on the Profits of Companies Listed on the BOVESPA and its Impact on Federal Tax Revenue. *Review of Business Management*, 12(35), 171-190.
10. Junior, E. P., & Martinez, A. L. (2020). The Relation between Operational Efficiency and Tax Aggressiveness in Brazil. *Revista Universo Contábil*, 15(4), 31-48.

11. Koch, C. J., Bampi, J., Scheren, G., & Roberto Dittadi, J. (2020). Relation between Economic and Financial Indicators With the Tax Burden of Non-Financial Companies Listed In B3. *Revista de Contabilidade do Mestrado em Ciências Contábeis da UERJ*, 25(1).
12. Llopis, R. M., Becerra, O. A. D., Diaz, S. C., & Esparza, A. A. (2018). Tax burden borne by electricity and mining companies in Peru during 2010-2015 period. *Revista Contemporânea de Contabilidade*, 15(37), 71-84.
13. Machado Gomes, A. P. (2016). Corporate Governance Characteristics as a Stimulus to Tax Management. *Revista Contabilidade & Finanças-USP*, 27(71).
14. Machado, M. C., & Nakao, S. H. (2012). Differences between taxable income and accounting profit of Brazilian companies with open capital. *Revista Universo Contabil*, 8(3), 100.
15. Nabais, J. C. (2019). Taxation of Companies by Real Income. -62A *Boletim Ciências Economicas*, 62, 121.
16. Nabais, J. C., & Lavouras, M. (2021). The Relationship between Accounting and Corporate Taxation in Portugal. *Boletim Ciências Economicas*, 64, 201.
17. Paes, N. L. (2017). The Cost Of Direct Taxation On Investment In Brazil. *Revista de Economia Contemporânea*, 21.
18. Paul, P., & Mitra, P. (2018). Analysis of the effect of working capital management on profitability of the firm: Evidence from Indian steel industry. *Asia-Pacific Journal of Management Research and Innovation*, 14(1-2), 32-38.
19. Pohlmann, M. C., & De Iudícibus, S. (2010). The relationship between the income taxation and the capital structure of large companies in Brazil. *Revista Contabilidade & Finanças*, 21, 1-25.
20. Prudencio Tinoco, J. E., Moraes, P. B., Peleias, I. R., Carvalho Santos Claro, J. A., & Joao, B. D. N. (2011). Study on the tax burden of Brazilian companies through the demonstration of the value added tax (VAT)-2005 to 2007 period. *Revista Ciências Administrativas*, 17(1), 84-111.
21. Pulido, M. M. M. (2016). *Corporate tax avoidance and ex ante equity cost of capital in Europe* (Doctoral dissertation, Universidade de Lisboa (Portugal)).