Vertical versus Horizontal Tax Incentives Policies in Brazil: Assessing the Impacts Using a Computable General Equilibrium Model

Alexandre Alves Porsse
Professor at the Department of Economics
University of Parana, Brazil

Felipe Gomes Madruga
PhD Student at the Department of Economics
University of Parana, Brazil

Abstract

Since the 2009 financial crisis, some national governments have adopted anticyclical tax policies for recovering and economic growth. These policies can be different in terms of what type of tax incentive policy (income, labor, value added) is chosen as well if the strategy is vertical, benefiting some sectors, or horizontal, benefiting all economic sectors. In Brazil, one of the anticyclical tax policy carried out by the federal government was to reduce the value added tax named "Imposto sobre Produtos Industrializados" (IPI) using a vertical strategy mainly benefiting the automobile sector among few others. Taking into account this recent experience, this paper aims primary to assess the efficacy of vertical versus horizontal tax incentive policies for promoting economic recovering. Additionally, the paper addresses the distributive effects of these policy strategies considering the impact on the income classes as well on the regional public finances. Considering the price effects of tax policies, the computable general equilibrium approach is the most appropriated methodological framework to achieve the objectives of this paper. We calibrated a CGE model for the Brazilian economy for 2007, recognizing the productive structure for 56 sectors and 8 types of labor segmented by income classes. This model is integrated with a public finance module specifying the government accounts for each level of government (federal, states and municipalities) as well the vertical fiscal linkages. The CGE model allow short run and long run simulations. The CGE model was used for simulating two shock scenarios. The first one represents the vertical tax policy and simulate a reduction in the IPI tax rate of the automobile sector in accordance with the average incentives over the period 2010-2013. The second one represents the horizontal tax policy and the simulation imply reductions in the IPI tax rate of all sector keeping the amount of tax revenue reduction equal to the vertical shock. These shocks were simulated for a short run closure considering the transitory nature of anticyclical policies. The simulation results show that the economic impact of vertical and horizontal tax incentives strategies are quite similar. The policy implication is that both strategies are indifferent in terms of the impact on GDP and employment. Nevertheless, the distributive impact evaluated through the effects on labor factor by income classes shows the vertical policy is more regressive than the horizontal policy. Considering the impact on the regional public finance, both policies imply reductions in the level of transfers to the regional governments due the vertical fiscal linkages of the Brazilian federalism. Despite the positive economic impact on GDP and employment, the magnitude of this effect is not so high and fiscal linkages among governments seems play an important role at least for the Brazilian economy.

Keywords: tax incentives, economic impact, distributive effects.

JEL Code: H23, H25, H30.

1. Introduction

The crisis that erupted in the US housing market in 2008 quickly disseminated different countries, both developed and developing, to a greater or lesser degree. In order to mitigate the negative effects, the governments resorted to various counter-cyclical policy instruments in the hope of reducing the spread of this crisis within their home markets. Inside the most frequently used instruments, there was the stimulus policy demand, both through increased government spending and through the use of localized sectoral incentive policy. In Brazil, the federal government promoted cut offs for various taxes, including the Tax on Industrialized Products (IPI) for some sectors that could quickly stimulate economic recovery, such as the automotive sector. In contrast, these sectors generally undertook to ensure the preservation of employment and worker's income for the beneficiary companies.

The literature on the impact of stimulus measures in times of crisis is extensive, analyzing both the mechanisms that operate in the actual decision of when individuals react to determine stimuli, as well as discussing what types of stimuli should be adopted, whether by increasing spending or through tax cuts. As pointed Barrel and Weale (2009) and Crossley et al. (2009), many factors can influence the response that a temporary reduction of taxes will have on stimulating demand in times of crises as witnessed in 2008, such as on the income and substitution effects of individuals. In the income effect, at first, nothing guarantees that the extra income brought about by a family for the reduction of tax is consumed, because if the family understands that the deficit which the government incurs has to be funded in the future by raising the tax burden, it will probably save this gain to bear a greater future cost. The positive income effect tends to occur only where families do not find it difficult to finance, so that an organized credit market can contribute to the effectiveness of the policy. In the case of the substitution effect, what happens is a substitution of future consumption to the present one brought about by the reduction in prices following the reduction of the rates for a particular tax. This effect is more likely for durable goods, which can still be consumed after the reconsideration of the rates, especially in the case of families who do not suffer from credit constraints.

Results as in Tagkalaki (2008) pointed in this direction, that the stimulus in times of crisis tend to be positive, both from the point of view of growth as a product and as consumption. But that does not end the discussion about the effects of counter-cyclical policies because they analyze Alesina and Ardagna (2010) the difference in growth that can be considered depending on the type of fiscal policy tool. In this study, the authors present evidence favourable to launch policies that cut tax at hand while increasing the place of government procurement for the most suitable propelled growth. Still, according to the authors, after the economic recovery caused by the stimulus, the best way for a country to resolve the eventual deficit caused by the incentives is by reducing spending rather than increasing the tax burden.

Nevertheless, a negative consequence of countercyclical policies can also arise, because if the goods chosen as the target to reduce taxation are durable and higher value-added, it is possible that politics becomes regressive, not necessarily benefiting the portion of the poor and vulnerable population during economic contractions. At this point, it is important, before any fiscal policy, to identify what instruments are to be used, because the results from the point of view of encouraging growth both in the short term towards the transition to long-term, will not necessarily be achieved through the same type of tax (Arnold et al. 2011). Since, in the short term, tax reductions on consumption can be used to stimulate the resumption of an economy in difficult times, which in the long run would make it more desirable to cut taxes on income, both for individuals and companies, as these would impact on the investment and productivity.

According to Mancuso and Moreira (2013), in a study about tax benefits during the period between the promulgation of the 1988 Constitution, most benefits lack clear rules as to its objective at the time of implementation and throughout their execution. It shows mainly the deficiency in the estimates on the financial impact of the budgets, transparency problems and the lack of information at the time of dissemination beyond the analysis of the actual effectiveness of benefits, especially at the time of decision-making on the continuation or for that, which is not an incentive.

Despite the discussion about which fiscal instruments (tax or spending) can be more effective in stimulating economic recovery, another important aspect concerns the sectoral allocation of incentives and their economic effects. In the case of tax policies, it is common to observe that some sectors are chosen as the target of policies to understand the larger multiplier effects than others and thus would be able to ensure a faster return to economic growth. This seems to be one of the strongest arguments for the automotive industry which repeatedly targets these policies. However, it would be desirable that a countercyclical tax incentive policy not only contributes both to the resumption of growth but also benefits the most vulnerable population groups, that is, the smaller income brackets.

In this sense, the objective of this study is to analyze the impact of the recent IPI reductions the the automotive sector had on the Brazilian economy, seeking to evaluate both its impact on growth as well as its distributive effects. Additionally, through a counterfactual analysis, we aim to assess whether there is a trade-off between economic impact and the distributive effects associated with sectoral scope for the tax incentive policy, that is, if the character of the policy is eminently sectoral or general. The assessment of this theme is carried out using a computable general equilibrium model calibrated for the Brazilian economy with the base year as 2007. In this model, the work factor was broken down into eight classes of income to enable analysis of the distributional effects. Two tax exemption policy scenarios are defined to implement the analysis. The first scenario simulates the effects of a sectoral policy of the IPI tax, with the auto industry as a reference for the analysis. The second scenario simulates the effect of a uniform-factual policy against the IPI exemption for all sectors, where the total amount of tax relief is kept equal to that of the policy-specific sector. Thus, the results of economic and distributional impacts of the two scenarios can be evaluated and discussed in order to assess which of these policies (sectoral or general) may be more effective in stimulating the economy and also to "protect" the most vulnerable social groups in the periodical crisis.

This paper is organized into six sections, including this introduction and the final considerations. The second section presents a recent overview of the IPI exemptions in Brazil, discussing its sectoral distribution. The third section presents the EGC model calibrated for the Brazilian economy and used in the simulations. The fourth section presents in detail the modeling strategy while the fifth section reports and discusses the results.

2. Overview of recent exemptions of IPI

The financial economic crisis of 2008/2009 cooled the international and national economic dynamics, leading several countries to adopt countercyclical fiscal policies. In Brazil, the use of tax exemptions has gained more and more momentum. As the exemption estimates published by the Receita Federal (Table 1), the IPI exemption jumped from R$ 1.8 billion in 2010 to R$ 2.6 billion provided for in 2014 (2007 constant prices), representing an increase of 46.7% in the period (8.0% a.a.). In every period, the waiver amount is equivalent to approximately R$ 15.6 billion, of which more than 50% of this volume focuses on the automotive sector. The time evolution of total waivers shows greater intensity in the use of this instrument to stimulate the economy in the years 2011-2014, and from 2015 expected reduction of IPI exemptions.

Table 1. IPI Exemptions (R$ million of 2007)

Exemptions by sector	2010	2011	2012	2013	2014	Total	%
Total	**1.759**	**3.850**	**4.081**	**3.305**	**2.581**	**15.575**	**100,0**
IPI – Automobile sector	562	1.225	2.586	2.413	1.532	8.316	53,4
IPI – Electrical goods	-	-	540	150	268	958	6,2
IPI - Food goods	-	-	58	533	645	1.235	7,9
IPI – Furniture sector	246	346	717	210	136	1.655	10,6
IPI – Others	951	2.279	180	-	-	3.411	21,9

Source: Raw data obtained from the Receita Federal.

The concentration of the IPI exemption policy of the automotive sector reflects a recurring role to choose a strategy for policy-makers, featuring a preference for sectoral nature of countercyclical policies to the detriment of general scope and policy. In the specific case of the automotive industry, its recurring choice as a strategic sector to be stimulated by tax policy is associated with its high degree of backward chaining in the national production chain. Thus, it is expected that the stimuli to the overflow for the remaining sector of the economy promotes an "intense and fast" recovery.

However, the effectiveness of sectoral countercyclical policies is something controversial in the literature since it can become difficult to remove completely, the recovery period and the incentives implemented initially which are to be transient due to organized interest group pressures. Additionally, sector countercyclical policies formulated on the perspective of "maximization of the growth impact" may not necessarily benefit the most vulnerable social groups during economic crisis, that is, the share of the poor. In this context, it is important to evaluate the effectiveness of sectoral countercyclical policies in relation to general anti-cyclical policies, both from the perspective of its impact on economic growth as well as its distributive effects.

This present discussion is relevant for the case of IPI exemption policy in the Brazilian context. As the data in Table 1, investigates whether the economic stimulus of an industry IPI exemption are actually higher than in the case of a wide exemption of IPI. It also investigates the distributional effects of both policies, seeking to identify the character of progressivity or regressivity of them. The aim of this study is to present these investigations within the recent IPI policy exemptions using a computable general equilibrium model calibrated for the Brazilian economy.

3. General features of the EGC model

The construction of CGE models in Brazil has advanced significantly over the last decades, especially with respect to the models developed using the Australian approach (Dixon, 1982; Horridge et al ., 1993). Models PAPA (Guilhoto, 1995) and B- MARIA (Haddad, 1999) can be considered the precursors of CGE models developed for the large-scale analysis of economic policy in Brazil. Models B-MARIA-SP (Domingues and Haddad, 2003) and B-MARIA-RS (Porsse, Haddad and Ribeiro, 2006, 2007 and 2008; Palermo, Porsse and Portugal, 2010) were used to study the economic impact of tax policies. These models generate comparative statics solutions to exogenous shocks policies whose simulation strategy may represent short-term or long-term closures.

To study the distributional effects of tax incentive policies, a CGE model was developed for the Brazilian economy following the specification of the ORANIG model developed for the Australian economy (Horridge, 2011). The Brazilian CGE model is named ORANIG-BR. The model also contain a fiscal account module integrated to the core module to enable evaluating impact of tax policies. The indirect tax on industry goods (IPI) is fully disaggregated in order to allow simulate the tax incentive policies. Additionally, the labor factor was disaggregated into eight types of labor accordingly to income classes to allow assess distributive effect. The model was calibrate for 2007, reflecting the economic and tax structure before the last economic crises. The calibrating used the database from the Resources and Use Table of Brazil and the methodology procedures developed by Guilhoto et. al (2002) and Guilhoto and Sesso Filho (2010). The ORANIG-BR model has 56 sectors, 56 products, one representative household, one external agent, three governments (Federal, State and Municipal) and two primary factors (labor and capital). Figure 1 shows the absorption matrix of the model’s core containing the aggregate monetary flows.

Figure 1. Absorption Matrix of ORANIG-BR Model, 2007 (R$ Millions)

		Users					
		1	2	3	4	5	6
		Firms	Investors	Household	Export	Government	Inventories
	Size	I	I	1	1	3	1
Basic flows	C×S	1.982.631	380.796	1.288.242	308.494	538.283	23.624
Margins	C×S×M	175.281	47.268	161.826	37.580	0	0
Indirect taxes	C×S×T	182.972	36.074	144.059	9.598	799	0
Labor	O	1.099.903					
Capital	1	1.155.630					
Production taxes	1	32.325					
Other costs	1	0					

C = Number of products (56)
I = Number of sectors (56)
S = Source (domestic and foreign)
O = Number of occupations (8)
M = Margins (retail and transport)
T = Indirect taxes (IPI, ICMS, Cofins and others)
G = Governments by level (Federal, State, Municipal)

The production function follows a nested structure specifying three optimization levels for the productive process of firms. Fixed proportion combinations of intermediate inputs and primary factors are assumed at the first level, through the Leontief specification. The second level involves substitution between domestically produced and imported inputs on one side, and substitution between capital and labor on the other side. A constant elasticity substitution (CES) function is used for the combination of inputs and primary factors. The third level involves substitution into the labor primary factor considering eight types of labor by income classes as follow:

- Under 1/2 minimum wage (MW)
- From 1/2 to 1 MW
- From 1 to 2 MW
- From 2 to 3 MW
- From 3 to 5 MW
- From 5 to 10 MW
- From 10 to 20 MW
- Over 20 MW

Investors are a category of use of final demand, and are held responsible for capital formation. They choose the inputs used in the capital formation process through cost minimization using a hierarchically structured technology. This technology is similar to the production technology, with some adaptations. As occurs with the production technology, the capital good is produced by domestic and imported inputs. At the second level, an aggregate bundle of intermediate goods is formed as the combination of inputs from different sources (domestic and imported). A CES function is used in the combination of goods from different sources.

The specification of household demand is based on a CES/linear expenditure system (LES) preference function. The demand equations are derived from a utility maximization problem accordingly to a Klein-Rubin (KR) utility function, whose solution follows hierarchical steps. At the bottom level, substitution

occurs across different domestic and imported sources of supply. This specification gives rise to the linear expenditure system (LES), in which the expenditure share above the subsistence level for each good represents a constant proportion of the total subsistence expenditure of the household.

All export goods have downward sloping demand curves for their own prices in the world market. A vector of elasticity defines the response of foreign demand to changes in the FOB price of regional exports. The government demand for public goods is based on the isolation of the consumption of public goods by the governments. However, productive activities carried out by the public sector cannot be dissociated from those performed by the private sector. Thus, the government's entrepreneurial behavior is dictated by the same cost minimization assumptions adopted by the private sector.

The government finance module incorporates equations determining the gross product, through the decomposition and modeling of its components, on both the expenditure and income sides. Budget constraints by each level of governments are also defined. Other definitions in the model include tax rates, basic prices, and purchase prices of commodities, tax revenues, margins, components of the gross domestic product (GDP), price indices, factor prices, aggregate employment and money wage settings.

The ORANIG-BR model can be used for short-run and long-run comparative static simulations. The basic distinction between these two types of closure lies in the treatment given to the microeconomic approach to capital stock adjustment. Capital stocks are held fixed in the short run, whereas in the long-run policy changes may affect capital stocks in each sector. In the short-run closure, besides the hypothesis of interindustry and interregional immobility of capital, the population and labor supply are fixed. On the demand side, investment expenditures are exogenous – firms cannot reassess investment decisions in the short run. Household consumption follows household disposable income, and government consumption is fixed (alternatively, government deficit can be set exogenously, allowing government expenditures to change). In the long-run closure, capital and labor are mobile across sectors. The major differences from the short-run closure lie in the configuration capital accumulation. Capital is directed towards more attractive sectors. This movement keeps the rates of return at their initial levels.

4. Simulating strategy

Two tax incentive policies are evaluated using the ORANIG-BR model. First, we consider a vertical tax incentive policy where tax exemption is applied exclusively to the automobile sector. Second, we consider a horizontal tax incentive policy where tax exemptions are distributed across all sectors. In both simulations, the total amount of tax revenue relief is the same, which allow compare the results.

The calibration of the shocks takes into account the IPI tax incentive policy implemented by the federal government for economic recovering after the financial crises of 2008/2009. Considering the amount of IPI exemptions published by government fiscal authorities as well as the amount of tax revenue for the period 2010-2013, both related to the automobile sector, it was calculated an average coefficient of IPI exemption. Table 2 presents the calculation procedures. This coefficient was used for calibrating the tax rate shocks on the automobile sector based on the database IPI flows. Thus, the vertical tax incentive policy is simulated using this shock vector.

Considering the coefficient of IPI exemption for the automobile sector applied to the database flow, the tax revenue incentive would be accounted for BRL 4.93 billions in 2007. This monetary amount was distributed over all industry sectors proportionally in order to achieve uniform changes in IPI tax rate. These tax rate changes represent the shock vector of the horizontal tax incentive policy. The shock of the vertical policy represents a reduction of 34.72% in the ad valorem tax rate of the automobile sector while the horizontal policy represents reduction of 6.09% in the ad valorem tax rate of all industry sectors.

The simulations were carried out considering the short-run closure. As tax incentives policies are expected to be transitory, this closure would be more appropriated. This mean that primary factors are keep immobile across sectors in the simulation scenario. Additionally, the fiscal solvency rule allows endogenous adjustment for the public deficit, which also seems more appropriated in the context of temporary tax policies.

Table 2. IPI exemptions coefficient on automobile sector (BRL millions, 2007)

Data	2010	2011	2012	2013	**Total**
IPI exemption (A)	562	1.225	2.586	2.413	**6,785**
IPI revenue (B)	4.848	5.600	3.128	2.509	**16,086**
Potential IPI revenue (C = A+B)	5.410	6.825	5.714	4.922	**22,870**
IPI exemption coefficient (A/C)	0,1038	0,1794	0,4525	0,4902	**0,2967**

Source: Elaborated by the authors.

5. Results

Table 3 presents the impact on macroeconomic variables. In general, the results are consistent with what one would expect from a tax incentive in which there is exemption of taxes by the government, as both GDP and employment increase after the policy shocks. Importantly, the impact on employment is higher than to GDP, showing that the tax incentive policies provide a more prominent effect in maintaining jobs.

From a macroeconomic point of view, the results indicate that the impact of vertical and horizontal tax incentives policies are quite similar. Although the automotive industry has high degree of linkage into productive system, the results show that this aspect is not a relevant difference in terms of overall economic impact with regard to preference for a vertical or horizontal exemption policy, at least concerning to the IPI tax policy. As the macroeconomic impact of the two tax incentives strategies is similar, this result would imply that policymakers could be indifferent in terms of choosing which strategy should be adopted for economic recovering.

It is noted that the positive policy effects are determined by the increase in household consumption and exports, as well as by the decrease in imports. As the reduction of the effective tax burden leads to reduction in the prices of domestic goods, there is a substitution effect that favors the production and consumption of domestic goods. Additionally, the price transmission effects on the production costs by sectoral linkages increase the competitiveness of export goods.

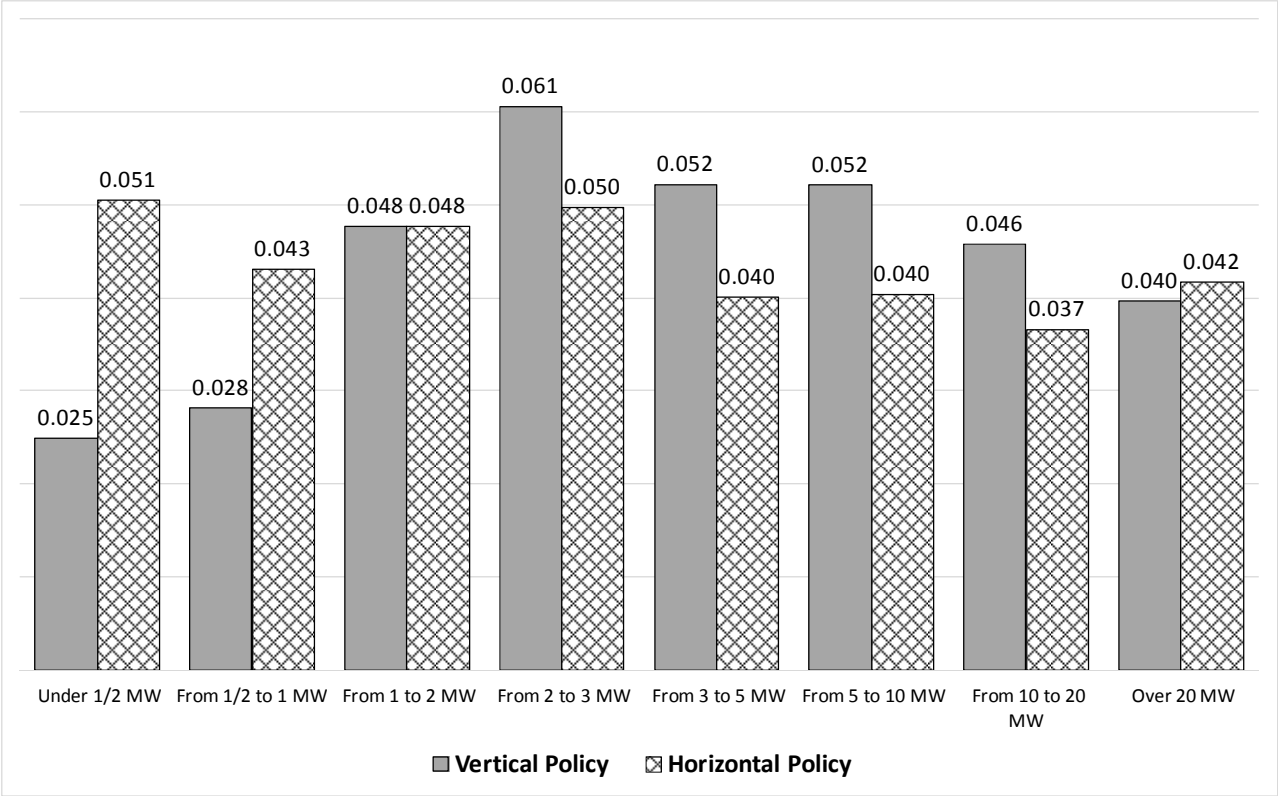
Figure 2 allow evaluating the distributive effects of the two tax incentive policies considering the impact on labor by type. The results show that the vertical policy tends to generate greater impacts the middle and upper income labor (2-10 minimum wages, mainly), while the horizontal policy benefits mostly the very lower income labor classes. The important implication of this result is that vertical tax incentive policy seems to be regressive comparing with horizontal tax incentive policy. On the policymaker view, considering that vertical and horizontal tax policies produce a very similar macroeconomic impact, the distributive effects could be take into account to choose the strategy of tax incentives. In the case of the Brazilian experience related to the IPI tax policy, our results support a horizontal tax policy in order to maximize macroeconomic impact and minimize distributive distortions.

Table 3. Macroeconomic effects: percentage change

Variables	Vertical Policy	Horizontal Policy
Real GDP	**0.0214**	**0.0210**
Employment	**0.0481**	**0.0423**
GDP components		
Real household consumption	0.0185	0.0202
Real aggregate investment	-	-
Real aggregate government consumption	-	-
Export volume	0.0268	0.0333
Import volume	-0.0708	-0.0426
Prices		
Consumer price index	-0.1441	-0.0941
Investment price index	-0.0991	-0.0750
Import price index	-	-
Export price index	-0.0163	-0.0180
Government price index	-0.0782	-0.0606
GDP deflator	-0.1020	-0.0758

Source: Calculated by the authors.

Figure 2. Distributive effects on labor by type



Source: Calculated by the authors. (MW = minimum wage).

Finally, Tables 4 and 5 present public finance results disaggregated by level of government. As the IPI is one of the taxes distributed to the regional governments accordingly to the Brazilian constitutional rules, the tax incentive policies, whether vertical or horizontal, imply a negative effect on indirect tax revenue of the federal government as well as on the transfer revenues received by regional governments. Even considering that tax base increases (real GDP) with the tax incentive policy shock, such an increase is not enough to compensate the revenue loss resulting from the tax rate changes. Thus the solvency rule imply an increase in the public deficit for all governments.

Table 4. Public finance effects: vertical policy

Variables	Municipal	State	Federal
Expenditure total	**-0.0949**	**-0.0848**	**-0.1117**
Expenditure on goods and services	-	-	-
Government consumption	-	-	-
Government investment	-	-	-
Personal benefit payments	-0.0991	-0.0991	-0.0991
Interest payments	-0.0806	-0.0806	-0.0806
Transfer expenditures	-0.0806	-0.0806	-0.2151
Other outlays	-0.0949	-0.0848	-0.1117
Revenue total	**-0.0949**	**-0.0848**	**-0.1117**
Government revenue	-0.1612	-0.1083	-0.1650
Direct taxes	-0.0806	-0.0806	-0.0806
Income taxes	-0.0806	-0.0806	-0.0806
Other direct taxes	-0.0806	-0.0806	-0.0806
Indirect taxes	-0.0806	-0.0806	-0.3407
Tariff revenue	-	-	-0.0602
Other indirect taxes	-0.0806	-0.0806	-0.3494
Transfer revenues	-0.2151	-0.2151	-
Other revenue	-0.0806	-0.0806	-0.0806
Public deficit	**-3.1232**	**-1.2621**	**-2.3040**

Source: Calculated by the authors.

Table 5. Public finance effects: horizontal policy

Variables	Municipal	State	Federal
Expenditure total	**-0.0705**	**-0.0621**	**-0.0907**
Expenditure on goods and services	-	-	-
Government consumption	-	-	-
Government investment	-	-	-
Personal benefit payments	-0.0757	-0.0757	-0.0757
Interest payments	-0.0558	-0.0558	-0.0558
Transfer expenditures	-0.0558	-0.0558	-0.1922
Other outlays	-0.0705	-0.0621	-0.0907
Revenue total	**-0.0705**	**-0.0621**	**-0.0907**
Government revenue	-0.1376	-0.0840	-0.1415
Direct taxes	-0.0558	-0.0558	-0.0558
Income taxes	-0.0558	-0.0558	-0.0558
Other direct taxes	-0.0558	-0.0558	-0.0558
Indirect taxes	-0.0558	-0.0558	-0.3198
Tariff revenue	-	-	-0.0401
Other indirect taxes	-0.0558	-0.0558	-0.3285
Transfer revenues	-0.1922	-0.1922	-
Other revenue	-0.0558	-0.0558	-0.0558
Public deficit	**-3.1376**	**-1.1533**	**-2.1785**

Source: Calculated by the authors.

6. Final remarks

The use of countercyclical tax policies for promoting economic growth has intensified in the Brazilian economy, especially after the latest international economic crisis. Although it is expected that such policies boost economic recovery, its formulation is rarely accompanied by a more careful evaluation of the potential economic impacts. In the Brazilian case, the countercyclical tax policies have been oriented to specific sectors, more precisely to the automobile sector because its strong linkages into productive system. This strategy reflect a preference of the Brazilian policymakers for adopting vertical tax incentive policies. In this paper we used a CGE model for evaluating this vertical policy strategy against a horizontal tax incentive policy.

Our results showed that the macroeconomic impact in terms of GDP and employment resulting from vertical or horizontal tax incentive policies are quite similar. But the distributive impact showed be more regressive to the vertical policy strategy than to the horizontal one. Both polices imply reduction in tax revenue for all levels of governments as well increase in the public deficit. As an import result of this investigation, policymakers should consider not only the macroeconomic impact of tax incentive policies but also their distributive effects. Considering the Brazilian experience, our results suggests that horizontal tax incentive policies would be preferable if the policy target is to promote economic recovering with less distributive distortion.

References

Alberto, A.; Ardagna, S. Large changes in fiscal policy: taxes versus spending. *NBER Chapters, in: Tax Policy and the Economy*, V. 24, p. 35-68, 2010

ALMEIDA, A. N. Elasticidades renda e preços: análise do consumo familiar a partir dos dados da POF 2008/2009. Nereus/USP, Texto para Discussão 04, 2011. Disponível em: http://www.usp.br/nereus/wp-content/uploads/TDNereus_04_11.pdf

Arnold, J. M.; Brys, B.; Heady, C.; Johansson, A.; Schwellnus, C.; Vartia, L. Tax policy for economic recovery and growth. *Economic Journal, Royal Economic Society*, v. 121, p. F59-F80, 2011.

BARREL, R.; WEALE, M. The economics of a reduction in VAT. *Fiscal Studies*, v. 30, n. 1, p. 17-30, 2009.

CROSSLEY, T. F.; LOW, L.; WAKEFIELDS, M. The economics of a temporary VAT cut. *Fiscal Studies*, v.30, n. 1, p. 3-16, 2009.

DE WET, T. J. (2003) The effect of a tax on coal in South Africa: a CGE analysis. PhD Thesis, University of Pretoria. Disponível em: http://upetd.up.ac.za/thesis/available/etd-06302004-143319/

DIXON, P. B. *et al*. *ORANI: a multisectoral model of the Australian economy*. Amsterdam: North-Holland, 1982.

DIXON, P. B. *et al*. *Notes and problems in applied general equilibrium economics*. Amsterdam: North-Holland, 1992. (Advanced Textbooks in Economics 32).

DOMINGUES, E. P.; HADDAD, E. A. Política tributária e re-localização. *Revista Brasileira de Economia*, v. 57, n. 4, p. 849-871, 2003.

DOMINGUES, E. P.; HADDAD, E. A. Sensitivity analysis in computable general equilibrium models: an application for the regional effects of the Free Trade Area of the Americas (FTAA). *Revista de Econometria*, v. 25, n.1, p. 1-25, 2005.

EMINI, C. A. *Designing the financial social accounting matrix underlying the "integrated macroeconomic model for poverty analysis"*: the Cameroon Country-case. 2002. Manuscrito.

GUILHOTO, J. J. M. *Um modelo computável de equilíbrio para planejamento e análise de políticas agrícolas (PAPA) na economia brasileira.* Tese (Livre Docência) – Escola Superior de Agricultura Luiz de Queiroz, Universidade de São Paulo, Piracicaba, 1995.

GUILHOTO, J. J. M.; SESSO FILHO, U. A.; LOPES, R. L.; HILGEMBERG, C. M. A. T.; HILGEMBERG, E. M. Nota metodológica: construção da Matriz Insumo-Produto utilizando dados preliminares das Contas Nacionais. Anais do II Encontro de Estudos Regionais e Urbanos, 2002.

GUILHOTO, J. J. M.; SESSO FILHO, U. A. Estimação da Matriz Insumo-Produto utilizando dados preliminares das Contas Nacionais: aplicação e análise de indicadores econômicos para o Brasil em 2005. *Economia & Tecnologia*, v. 23, p. 53-62, 2010.

GUILHOTO, J. J. M.; SESSO FILHO, U. A.; LOPES, R. L.; HILGEMBERG, C. M. A. T.; HILGEMBERG, E. M. Nota metodológica: construção da Matriz Insumo-Produto utilizando dados preliminares das Contas Nacionais. Anais do II Encontro de Estudos Regionais e Urbanos, 2002.

GUILHOTO, J. J. M.; SESSO FILHO, U. A. Estimação da Matriz Insumo-Produto utilizando dados preliminares das Contas Nacionais: aplicação e análise de indicadores econômicos para o Brasil em 2005. *Economia & Tecnologia*, v. 23, p. 53-62, 2010.

HADDAD, E. A. *Regional inequality and structural changes: lessons from the Brazilian experience*. Aldershot: Ashgate, 1999.

HADDAD, E. A. *Retornos crescentes, custos de transporte e crescimento regional*. Tese (Livre Docência) – Faculdade de Economia e Administração, Universidade de São Paulo, São Paulo, 2004.

HORRIDGE, J. M.; PARMENTER, B. R.; PEARSON, K. R. ORANI-F: a general equilibrium model of the Australian economy. *Economic and Financial Computing*, London, v. 3, n. 2, 1993.

HORRIDGE, M. ORANI-G: a generic single-country computable general equilibrium model. Centre of Policy Studies and Impact Project, Monash University, Australia, 2011.

JOHANSEN, L. *A multi-sectoral study of economic growth*. Amsterdan: North-Holland, 1960.

MANCUSO, W. P.; MOREIRA, D. C. Benefícios tributários valem a pena? Um estudo de formulação de políticas públicas. *Revista de Sociologia e Política*, v. 21, n. 45, p. 107-121, 2013.

PALERMO, P. U.; PORSSE, A. A.; PORTUGAL, M. S. Exercícios de reestruturação tributária para o Rio Grande do Sul: análise com um modelo de equilíbrio geral computável inter-regional. *Economia*, v. 11, p. 187-216, 2010.

PORSSE, A. A.; HADDAD, E. A.; RIBEIRO, E. P. Competição tributária regional, externalidades fiscais e federalismo no Brasil: uma abordagem de equilíbrio geral computável. In: Secretaria do Tesouro Nacional. (Org.). *Finanças Públicas: X Prêmio Tesouro Nacional*, 2005: coletânea de monografias. São Paulo: Ágape Editores Ltda., 2006.

PORSSE, A. A.; HADDAD, E. A.; RIBEIRO, E. P. Economic effects of regional tax incentives: a general equilibrium approach. *Latin American Business Review*, v. 7, p. 195-216, 2007.

PORSSE, A. A.; HADDAD, E. A.; RIBEIRO, E. P. Competição tributária regional no Brasil: análise com um modelo EGC inter-regional. *Pesquisa e Planejamento Econômico*, v. 38, p. 351-387, 2008.

Receita Federal do Brasil – Desonerações Instituídas. Disponível em: http://www.receita.fazenda.gov.br/Arrecadacao/RenunciaFiscal/default.htm

SOUZA, F. E. P.; LUPORINI, V. Câmbio ou Preços: o quê mais tem afetado as exportações brasileiras? Instituo de Economia – UFRJ, Grupo de Conjuntura Econômica, 2011. Disponível em: http://www.ie.ufrj.br/images/conjuntura/Cambio_ou_precos.pdf.

TAGKALAKIS, A. The effects of fiscal policy on consumption in recessions and expansions. *Journal of Public Economics*, v. 92, p. 1486-1508, 2008.

TOURINHO, O. A. T.; KUME, H.; PEDROSO, A. C. S. Elasticidades de Armington para o Brasil – 1986-2002: novas estimativas. IPEA, Rio de Janeiro, Texto para Discussão 974, 2003. Disponível em: http://www.ipea.gov.br/portal/images/stories/PDFs/TDs/td_0974.pdf