Available online at www.sciencedirect.com

ScienceDirect

EconomiA 16 (2015) 111–127

ECONOMIA

www.elsevier.com/locate/econ

Vertical tax competition in Brazil: Empirical evidence for ICMS and IPI in the period 1995–2009

Rodolfo Herald da Costa Campos [a,*], Roberto Tatiwa Ferreira [b,a], Rafael Kloeckner [a]

[a] *Graduate Program in Economics, Federal University of Ceará (CAEN/UFC), Brazil*
[b] *Department of Applied Economics, Federal University of Ceará (CAEN/UFC), Brazil*

Available online 28 March 2015

Abstract

The main objective of this study is to quantify the impact caused by changes in federal tax on the tax policy of the Brazilian states, considering the presence of horizontal tax competition between states. Using panel data covering 26 Brazilian states plus the Federal District during the period 1995–2009, two models were estimated representing the average reaction of the states in response to changes in federal tax rates. In the first model, both levels of government act simultaneously, whereas in the second model, reaction is sequential, with the federal government acting as the leader in defining its effective tax rates. The results indicate a positive and significant response of states to increases in the federal tax rate, resulting in an over-taxation of the common tax base and higher tax rates. Additional tests show that the first model is the most suitable to represent the problem analysed.

JEL classification: E62; H20; H77

Keywords: Fiscal federalism; Tax competition; Horizontal and vertical tax externalities; Reaction functions

Resumo

Objetivo principal desse trabalho é quantificar qual o impacto provocado por mudanças no imposto federal sobre a política tributária dos estados, considerando a presença de competição tributária horizontal entre os estados. Utilizando um painel de dados que abrange os 26 estados brasileiros mais o Distrito Federal no período 1995–2009, foram estimados dois modelos que representam a reação média dos estados em resposta a mudanças nas alíquotas do governo federal. No primeiro modelo ambos os níveis de governo agem simultaneamente, enquanto que no segundo a reação é sequencial com o governo federal atuando como líder na definição de suas alíquotas efetivas. Os resultados apontam para uma resposta positiva e significante dos estados à aumentos na alíquota tributária federal resultando em uma sobretaxação da base tributária comum e alíquotas elevadas. Testes adicionais mostram que o primeiro modelo é o mais indicado para representar o problema analisado.

Palavras-chave: Federalismo Fiscal; Competição Tributária; Externalidades Horizontal e Vertical; Funções de Reação

* Corresponding author.
E-mail addresses: rodolfohcc@yahoo.com.br (R.H. da Costa Campos), rtf2@uol.com.br (R.T. Ferreira), mrrafaelk@hotmail.com (R. Kloeckner).
Peer review under responsibility of National Association of Postgraduate Centers in Economics, ANPEC.

http://dx.doi.org/10.1016/j.econ.2015.03.004
1517-7580

1. Introduction

A federal system is characterised by the existence of interdependent levels of government acting in the same federation with a decentralised governance structure. Adopting a system based on fiscal federalism implies distributing constitutional powers of taxation according to the levels of government, where each level is autonomously responsible for the procedures of contribution and budget management, fiscal transfers, composition and dimensioning of expenses to allow a Pareto efficient situation among the levels of government. Therefore, a country that is politically organised according to the patterns of fiscal federalism shares, among the levels of government, the responsibility for managing allocative, distributive and stabilising functions.

However, it is not always possible to find a situation where the levels of government in the federation act efficiently in a Pareto sense. In federal systems, where the various levels operate simultaneously in the same tax regime and set tax rates on the same bases, there may be the existence of externalities. In this context, one might see a phenomenon known as tax competition. Keen (2008) defines tax competition as a strategy of fiscal adjustment in a non-cooperative game among government levels, where each level adjusts the parameters of its tax system taking into account the tax policy movements of other governments.

The phenomenon of tax competition arises when the decisions of fiscal and tax policy taken by a level of government affect the tax revenues of other governments in the federation (Mintz and Tulkens, 1986; Goodspeed, 1998). Thus, each government entity has the ability to modify the size of its tax base when adjusting its tax rates at the expense (or benefit) of its neighbours (Mintz and Tulkens, 1986). In this context, fiscal interactions can lead to two types of externalities: one horizontal and one vertical. In the first case, the externality occurs when governments at the same level in the federation compete for mobile revenue sources (e.g., capital, labour, firms), setting their tax rates to attract them into their territories. In the second case, the externality arises when different levels of government (e.g., state and federal governments) are taxing the same economic base. This co-occupancy may be explicit or implicit when tax bases are somehow inter-related in some economic sense. The vertical interaction can result in overtaxing, creating a situation in which the tax rates are higher than those that would prevail in the social optimum (Keen and Kotsogiannis, 2002). In both cases, the decisions regarding the adjustment of tax rates in one level of government end up affecting the tax revenues of the other level of government, whether they are distinct or not.

The theoretical model proposed by Flowers (1988) and its developments made by Boadway and Keen (1996), Boadway et al. (1998), Keen (1998), Flochel and Madies (2002) and Keen and Kotsogiannis (2002, 2003, 2004) show two important aspects of vertical interaction: interdependence among different government levels and the equilibrium levels of taxation. The theoretical analysis of interdependence explores how the lowest government levels react to a change in the tax rate of the highest level of government.[1] The theoretical prediction for this analysis is generally ambiguous in the sense that there may be positive or negative reactions from the lower levels of government in response to increases in the tax rates of the highest level. An increase in taxes at one government level results in a revenue reduction for another government level, due to contraction in the shared tax base. In the equilibrium, the result is usually an over-taxation of the common base at higher tax rates.

The focus of this work is the vertical tax competition between states and the federal government in Brazil. Once tax competition between levels of government may distort the levels of taxation, the main purpose of this work is to estimate the reaction functions that quantify the average effects of states' tax policy in defining their effective tax rate of ICMS, in response to increases in the effective tax rates of IPI, because they both focus on the same tax base (consumption, in general). In other words, this work aims to determine empirically whether, on average, there exists a significant strategic interaction – from a statistical point of view – between states and the federal government in setting their tax rates. The analysis of these results provides empirical evidence to determine whether, in the Brazilian tax system, the states and the federal government are overcharging the same tax base.

Empirical studies on vertical tax competition have been focusing on the estimation of a reaction function that shows how subnational governments respond to tax policy choices from the federal government. The works of Besley and

[1] The works of Boadway and Keen (1996), Keen (1998) and Besley and Rosen (1998) provide a theoretical framework for the analysis of interdependence in tax policies among different levels of government that share a common tax base.