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Contaduría y Administración 62 (2017) 1657–1669

[www.contaduriayadministracionunam.mx/](http://www.contaduriayadministracionunam.mx/)

**Contaduría y  
Administración**  
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# Gibrat's law test on Brazilian commercial banks<sup>☆</sup>

*Contraste de la Ley de Gibrat en la banca comercial brasileña*

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Received 21 December 2016; accepted 22 May 2017

Available online 27 November 2017

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## Abstract

In recent years, Brazil has been one of the countries with the biggest changes in the banking sector. The process of deregulation that began in 2002 has entailed the increase of the presence of foreign banking and the increase of competition, among other aspects. In this context, the objective of this study consists in contrasting Gibrat's Law in the Brazilian commercial banking during the period of 2002–2013 with the objective of contributing with evidence for the construction of a growth model for banking that will guide the financial policy of the country. For this, the quartile regression methodology is utilized, since we consider that it analyzes the relation between growth and the size of the entities more thoroughly than the empirical contrasts given by previous empirical evidence. The results obtained indicate that there is a non-linear relation in an inverted U form between growth and size in the Brazilian commercial banking. These results allow us to affirm that the relative dispersion of the sizes of the financial entities will tend to decrease in time and with this, the concentration of the sector.

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*JEL classification:* G01; G20; G21

*Keywords:* Commercial banks; Brazil; Gibrat's law; Growth; Size

## Resumen

En los últimos años Brasil ha sido uno de los países con mayores cambios en el sector bancario. El proceso de desregulación iniciado en 2002 ha conllevado el aumento de la presencia de banca extranjera y el

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<sup>☆</sup> This work has received the financial aid of the *Junta de Extremadura*, concretely of the *V Plan Regional de Investigación Desarrollo Tecnológico e Innovación* (2014–2017), through the *Grupo de Investigación GIMAF* (reference GR15027).

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Peer Review under the responsibility of Universidad Nacional Autónoma de México.

<https://doi.org/10.1016/j.cya.2017.10.004>

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incremento de la competencia, entre otros aspectos. En este contexto, el objetivo del presente estudio consiste en contrastar la Ley de Gibrat en la banca comercial brasileña durante el periodo 2002–2013 con el objeto de aportar evidencia para la construcción de un modelo de crecimiento para la banca que oriente la política financiera del país. Para ello se emplea la metodología de regresiones cuantílica que consideramos analiza de manera más exhaustiva la relación entre el crecimiento y el tamaño de las entidades que los contrastes empíricos aportados por la evidencia empírica previa. Los resultados obtenidos nos indican que existe una relación no lineal en forma de U invertida entre crecimiento y tamaño en la banca comercial brasileña. Estos resultados nos permiten afirmar que la relativa dispersión de los tamaños de las entidades financieras tenderá a reducirse en el tiempo y con ello la concentración del sector.

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*Códigos JEL:* G01; G20; G21

*Palabras clave:* Banca comercial; Brasil; Ley de Gibrat; Crecimiento; Tamaño

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## **Introduction**

During recent decades, the financial sector has experienced significant changes due to the liberalization and deregulation of the markets, the technological changes, and the international financial crisis, which have entailed an increase in the degree of banking concentration and the size of the entities (Fernholz & Hoch, 2016).

Traditionally, the empirical studies on banking concentration have been based on the contrast of Gibrat's Law, which implies the absence of relation between size and growth, so that all entities have the same probability of growing (Alhadeff & Alhadeff, 1964; Benito, 2008; Fernholz & Hoch, 2016; Goodard, McKillop, & Wilson, 2002; Goddard, Molyneux, & Wilson, 2004; Goddard, McKillop, & Wilson, 2014; Rhoades & Yeats, 1974; Shehzad, De Haan, & Sholtens, 2013; Tschoegl, 1983; Vennet, 2001; Ward & McKillop, 2005; Wilson & Williams, 2000; Yeats, Irons, & Rhoades, 1975). However, these studies present two important limitations: they focus on the analysis of the banking sectors of developed countries, and the results obtained are mixed. For this reason, it would be advisable to expand the previous empirical evidence with the objective of obtaining conclusive results.

In this sense, it is important to indicate that in recent years it has been observed that the number of total assets of the entities has decreased in the Euro zone and the United Kingdom (BOE, 2010), while it has increased in other countries such as Brazil (Cull & Martínez Pería, 2013). Proof of this is the outstanding presence of foreign financial entities such as the Spanish Banco Santander and the British HSBC in the Brazilian banking sector, occupying the fifth and sixth position in market shares, respectively.

In this context, the objective of this study is to analyze the growth of banking in Brazil during the 2002–2013 period through the contrast of Gibrat's law and the incorporation of a series of methodological novelties regarding the traditional studies. Firstly, we analyze the growth-size relation by quartiles, as we consider that the attainment of mixed results by the previous empirical evidence can depend on the distribution of the growth rates of the entities, even finding different relations per entity groups. Secondly, we carried out an analysis to detect if the results found per quartiles significantly differ between them. In this manner, the quartile analysis allows us to carefully analyze the type of existing relation between the growth and size of the entities, finding that sometimes the relation between said variables is more complex than what could be assumed

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