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# Determinants of leverage in mining companies, empirical evidence for Latin American countries

*Determinantes de apalancamiento en compañías mineras, evidencia empírica en países latino americanos*

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## Abstract

This paper applies static and dynamic panel data methods to explore the determinants and the trend of leverage across 14 mining firms in Mexico, Colombia, Chile, Brazil and Peru from the first quarter in 2004 to the third quarter in 2014, and also contrasts the results with relevant theories. We find that tangibility increases leverage, while growth and size do not have significant effect. Profitability reduces leverage, which is consistent with the first alternative of the Hierarchical Order theory. The Colombian firms start with lower levels of leverage and reduce it as tangibility, size, growth and profitability increase and hence, these firms are more financially stable, and their performance, in particular, is consistent with the first alternative of the Hierarchical Order theory. Lagged values of leverage are more robust determinants of present values of leverage than the other explanatory variables.

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*Keywords:* Capital structure; Leverage; Profitability; Firm size; Firm growth

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## Resumen

En el artículo se aplican modelos estáticos y dinámicos de datos de panel para explorar las determinantes y la tendencia del apalancamiento en 14 empresas mineras de México, Colombia, Chile, Brasil y Perú, del primer trimestre de 2004 al tercer trimestre de 2014 y se contrastan los resultados con teorías relevantes. Encontramos que la tangibilidad incrementa el apalancamiento, mientras que el crecimiento y tamaño no tienen efecto significativo. La rentabilidad reduce el apalancamiento, lo cual es consistente con la primera alternativa de la teoría del Orden Jerárquico. Las firmas Colombianas inician con niveles de apalancamiento más bajos y lo reducen conforme la tangibilidad, el tamaño, el crecimiento y la rentabilidad se incrementan, por lo tanto estas empresas son financieramente más estables y su desempeño, en particular, es también consistente con la primera alternativa de la teoría del Orden Jerárquico. Los valores rezagados del apalancamiento son determinantes más robustos de los valores presentes en comparación con las demás variables explicativas.

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*Palabras clave:* Estructura de capital; Apalancamiento; Rentabilidad; Tamaño de la empresa; Crecimiento de la empresa

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## Introduction

In this paper a panel data model is estimated to analyse the variables that explain the stock structure of the mining firms in Mexico, Colombia, Chile, Brazil and Peru with information from the 2004 to 2014 period, with this information the determinants that guide the indebtedness level of the firm are identified, for this analysis concepts from the capital structure corporate finance theory are used.

From actual information the interrelationship that exists between the economic factors and the financial decisions was empirically established using static and dynamic panel data models, the model is specified based on a set of selected variables that were calculated using the financial reports of the firms.

The analysis is based on the financial neoclassical economic theory as [Damodaran \(2001\)](#) referred; indicating that in order to study the stock structure the main focus must be set on the corporate value and the impact that contains the capital structure. In particular we focus on the Trade-Off theory and the Hierarchical Order theory.

The financing decision seeks to maximise the value of the company, which is equivalent to solving the problem of minimising the corporates capital cost, which corresponds to the weighted average of a mixture between the cost of their own funds and cost of debt used to acquire productive assets.

Literature shows that it is an issue that has been explored to find the factors that motivate different debt levels; the first researcher to address this problem was [Grunfeld \(1958\)](#) in his doctoral thesis. As an econometric tool he used the panel data structure to find empirical evidence, within this research his database is relevant since it has specific characteristics, which allows the problem solving.

From the economical point of view, the financing decision corresponds to the choice of the economic agents between the shareholder funds or debt subscription resources, this choice is oriented to the lower long-term cost, which creates a greater value for the company, this concept

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