Tax haven ownership and business groups:

elusion incentives in Ecuadorian firms

BALAS Track: Corporate Finance

Keywords: Business Groups, Tax havens, Tax Elusion

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ABSTRACT

The objective of this paper is to assess the existence of transfers within business groups in Ecuador, especially those with shareholders located in tax havens, with the motivation of reducing their tax burden. We estimate the differential sensitivity of profitability to the marginal tax rate, controlling for firm and industry characteristics. We find the tax response coefficient between group and stand-alone firms is significantly different, especially when accounting for tax-haven ownership indicators. This analysis contributes to understanding this business configuration and to public policy design to improve the efficiency of the taxation system regarding tax havens.

1. Introduction

Business groups have been widely studied in the academic literature. They are defined as a set of legally independent firms, operating in multiple industries, which are bound together by persistent formal and informal ties (Khanna and Yafeh, 2007). In developing economies, business groups configuration and practices are of particular interest since they control an important share of the economy. This paper contributes to the business groups literature as it provides evidence of profit shifting using methods that relate the reported profitability of companies to their tax incentives, and shows how different ownership configurations, specifically Business Groups, are used to take advantage of tax havens in a developing economy.

There are adverse economic implications of tax havens, particularly for developing economies, as they rely on tax revenues for government expenditure and investment. Thus, the development of business groups, the relocation of capitals to tax havens, and the increasing volume of transactions between related parties have been a concern for tax administrations, rising awareness of firms' incentives for income shifting among affiliates to minimize the tax bill.

This paper aims to shed light into Ecuadorian business groups behavior in response to tax incentives, and to provide evidence of tax motivated income shifting among domestic affiliates, especially those with ownership in tax havens. Understanding business groups will allow the tax administration to enhance better risk analysis and to provide policymakers with a better guidance to address harmful taxation practices.

2. Corporate Taxation and Tax Havens in Ecuador

Corporate income tax is levied on companies that are residents in Ecuador, on worldwide income basis. Taxable income is the profit derived from business activities, and is calculated deducting all the expenses from the revenues used to produce them. In 2010, the Organic Code of Production, Commerce and Investment introduced a progressive reduction of the corporate income tax from 25% to 22%. Hence, since 2013, the standard corporate income tax rate in Ecuador is 22%. However, the corporate income tax rate still depends on the composition of the company shareholders. If the shareholders are located in tax-haven jurisdictions, the corporate tax rate is increased to 25%, and it is applied to the tax base in proportion to the tax-haven shareholders' ownership; if this ownership exceeds 50%, the 25% rate applies to the entire tax base (EY, 2016).
In the Ecuadorian Taxation System, firms' losses can be carried forward and be used to offset taxable income from up to the next five years, only up to the 25% of the fiscal year profits. These two taxation configurations are applied in the modelling of tax rates for the study.

The fiscal year is a calendar year. Each firm must file in a separate tax return regardless of being part of business group. Consolidated tax returns are not allowed. Recording is done on the accrual basis. International Financial Reporting Standards were adopted from 2010, following a schedule[1] imposed by the Companies' Supervisory Authority of Ecuador (*Superintendencia de Compañias*). By 2012, all types of firm adopted the IFRS. In compliance of IFRS, the corporate income tax return form has been structured/adapted to report the financial statements following the international rules.

In 2007, the Ecuadorian IRS started the identification of firms that are Business Group members: "for taxation purposes, a business group is defined as a set of members, persons or organizations (companies), domestic or foreign, where one or some of them directly or indirectly own 40% or more of the shareholding in other companies" (LORTI, 2010). By 2016, Ecuador's Internal Revenue Service (IRS) identified 200 business groups that include 6,361 tax payers. Business groups accounted for 51% of the total income tax revenue, and 17% of the total tax revenue for the fiscal year 2015. Additionally, the Transfer Pricing Regime was introduced in 2008. While transactions between related parties must be conducted at arm's length terms, specific regulations were introduced for common income shifting transactions such as management services, transfers of assets (tangible and intangible), and thin capitalisation rules, but these regulations are related solely to foreign transactions. Transactions occurring between domestic affiliates of business groups are not subject to any report, based on the assumption that all domestic companies are taxed with the same corporate income tax.

[1] Resolution No. 2008.11.20 08.G.DSC.010 issued by the Superintendent of Companies and published in Official Gazette No. 498 of 31 December 2008

During the years 2016 and 2017 the most representative increase is presented, since the number of groups grew by 66% in relation to the average of previous years. The most relevant sectors where this grow occurred are mining and oil, telecommunications, manufacturing, banking and insurance, fishing and construction. Recently, the IRS announced in that, by August 2017, business groups owed a total of USD 2,260 million (equivalent to 2% of GDP) to the tax administration (IRS, 2017). Those values represent, according to the tax authorities, more than 50% of the total tax debt. These figures provide a clear insight on the importance of business groups for a developing economy as Ecuador.

In January 2017, Ecuador assumed the presidency of the G77 + China for the first time and one of its main objectives is to promote the fight against tax havens. Moreover, in May 2017 Ecuador joined the Global Forum on Transparency and Exchange of Information for Tax Purposes as its 140th member. Members of the Global Forum include all G20 countries, all OECD members, all international financial centers and a very large number of developing countries. Ecuador, like all other Global Forum members will participate on an equal footing, and is committed combatting tax evasion through implementing the internationally agreed standards of transparency and exchange of information for tax purposes. All the initiatives above described are the result of a deep transformation of the tax system through successive tax reforms since 2007, especially regarding the international treatment of income tax. In addition, since 2011, Ecuador has been actively participating in technical meetings for developing economies convened mainly by the United Nations, OECD and CIAT, and as results of those meetings has seen the need to adapt their internal regulations to the new global situation.

3. Literature Review

Business groups have been vastly studied in several fields in economics, such as industrial organization, corporate finance, and development. Khanna and Yafeh (2007) present an array of business groups literature and evidence from around the world, offering a taxonomy for the study of these organizations. Business groups are described as paragons or parasites, depending on the motivation for their origin and prevalence. In a recent review, Colli and Colpan (2016) survey the corporate governance of business groups. They see this as a developing field, specifically in the ownership structure of business groups and the understanding of their role in different stages of economic development. This paper contributes to the literature that supports the negative side of business groups in developing economies, as they supposedly extract value from the State by using their organizational structure to reduce the total tax burden and appear to be taking advantage of tax havens.

Given the economic implications of tax havens, there is a growing body of literature that study these jurisdictions. In a very recent paper, Alstadsæter, Johannesen, and Zucman (2017) estimate that about 10% of world GDP is held in tax heavens,

with a global variety of estimates, but a preoccupying figure in Latin American countries, where the share is over 60% for Venezuela and about 35% in Argentina. It has also been argued that the consequences of tax havens for developing economies are more severe and carry implications for wealth inequality, as they affect the government power of generating tax revenues causing several other distortions. Johannesen et al. (2016) find that profits are about twice as sensitive to tax incentives in developing countries as in developed countries. There are still many unclear answers to questions such as who are the users of tax havens and which are the incentives they carry. One of streams relate to the corporate ownership configuration, such as multinationals, business groups, among others, and how they apply these structures for profit shifting.

The Organization for Economic Co-operation and Development – OECD (2014) defines base erosion or profit shifting as "the instances where the interaction of different tax rules leading profits on Multinational Enterprises (MNEs) not being taxed at all" or "the arrangements that achieve no or low taxation by shifting profits away from the jurisdictions where the profits take place". ODCE has a major role in addressing income shifting, working with governments and tax administrations to avoid tax evasion through income shifting among foreign affiliates. Also, academics have concentrated income shifting research mostly on transactions between international related parties. This study focuses on income shifting between domestic companies in the same jurisdiction.

Other studies have provided similar evidence of income shifting between affiliates of business groups in Asian economies such as Gramlich et al. (2004) for Japan, and Jung et al. (2009) and Park et al. (2014) for Korea. Gramlich et al. (2004) studied income shifting between the Japanese Keiretsu firms minimizing the tax burden of these groups. Jung, Kim and Kim (2009) studied the tax-induced income shifting behavior among affiliated firms in Korean Chaebols, and found that the extent of the income shifting activities depend on its effects in non-tax cost factors. Park, Lim and Kim (2014) provide support of the effect of the ownership structure of business groups on the direction of income shifting between affiliates.

While Korean chaebols, Japanese Keiretsu, Indian and European business groups have been extensively studied, an increasing literature is developing to study business groups in Latin-American economies. For the case of Ecuador, Granda and Wiggins (2010) studied the transmissions of profits shock among members of business groups, identified by the tax administration, finding empirical evidence of transfer of profits through tunneling and the use of the business groups as internal capital markets.

Desai and Dharmapala (2008) provide an economic approach to taxation and corporate governance. Regarding corporate ownership, they emphasize on the importance of studying the impact of tax systems on ownership patterns, and also on how

ownership patterns constrain corporate taxation. In the context of business groups, those relationships impose additional challenges for tax administrations in the global availability of tax havens.

The limited availability of financial resources and the poor development of the Ecuadorian capital market provide firms with incentives to avoid reporting the profits in the financial statements, leading firms to search other mechanisms to improve cash flows, like tax planning strategies and to use tax havens to expand their options for financial services, reduce risk or with other purposes. Understanding how business group structures contribute to the implementation of these mechanisms is the main objective of this study.

4. Materials and Methods

The research question that this paper explores is: Are Ecuadorian Business Group firms, with different levels of tax haven ownership, shifting income among group members with the purpose of reducing their total tax burden? The basic assumption to model the analysis is that transferring resources from members with higher marginal tax rates to members with lower marginal tax rates can reduce overall taxes; so on average BG firms' tax rates will be lower than those of comparable stand-alone firms. For the purpose of this research, tax rate refers to corporate income tax rate.

For the analysis, effective tax rates (ETR) and marginal tax rates (MTR) are taken into account for comparative purposes. Firms observe an ETR for any period of time, as it is an average measure of taxes paid every period over the pre-tax income received. The MTR is key to the analysis of firm decision-making in financial matters and for taxation planning studies. It takes into account how the firms take advantage of tax incentives such as carry-forward and carry-back deductions, investment tax credits, and other similar incentives in an inter-temporal horizon. There are several alternatives available to obtain a measure of the MTR, we follow the approach of Graham (1996) who provides a methodology that offers several advantages. He defines MTR as "the present value of current and expected future taxes paid on an additional dollar of income earned today". We will follow this method to simulate the MTR by generating a stream of taxable income and applying tax incentive schemes. This approach yields one individual rate for each firm and each year.

A statistical analysis is performed to compare business group and stand-alone firm's profitability level and marginal tax rates, controlling for size and other firm and industry characteristics. Also, a regression model is used to estimate the sensitivity of pre-tax profitability to the marginal tax rate, also called the tax response coefficient, to examine the differences between the two types of firms, and the firms' tax haven ownership status. It is described by the following equation

$$Pretax\ prof_{i,t} = \beta_0 + \beta_1 MTR_{i,t} + \beta_2 BG_i + \beta_3 TH_i + \beta_4 (MTR_{i,t} * BG_i) + \beta_5 (MTR_{i,t} * TH_i) + \beta_6 (MTR_{i,t} * BG_i * TH_{i,t}) + \beta_7 Leverage_{i,t} + \beta_8 Adv_{i,t} + \beta_9 Export_{i,t} + \beta_{10} Ind\ prof_{i,t} + \varepsilon_{i,t}$$

(1)

where

Pretax prof	is the ratio of pre-tax income[2] to total assets
MTR	is the Marginal Tax Rate
BG	is a binary variable that takes the value of 1 if a firm is affiliated with a business group, according to the Ecuadorian IRS definition
TH	is a binary variable that takes the value of 1 if a firm has shareholders located in a tax haven jurisdiction, and 0 otherwise
Size	is the natural logarithm of the total assets.
Leverage	is the ratio of total debt to total assets
Adv	is the ratio of advertising expenses to total sales
Export	is the amount of exports to total sales ratio
Indprof	is the industry median pre-tax income to assets ratio based on 3-digit ISIC code.

By comparing the profitability vs. tax rate relationship, we are able to assess the existence of transfers among group members with shareholders located in tax haven for tax elusion purposes. β_1 is the sensitivity of pre-tax profitability to changes in the marginal tax rate. The coefficients of interest are β_4 , β_5 and β_6; they are expected to be negative in the case of diversion of resources among business groups firms, tax haven ownership or both. The Effective Tax Rate (ETR) is used as an alternative to the Marginal Tax Rate in the same model.

The information used for this research is firm-level panel data, from 2014 to 2016 provided by Superintendencia de Compañías from their public administrative records, reported in the Tax Form 101. The ownership information of the firms is also provided by this institution, with details including the shareholder name, country of origin, share, and identification number. With the country of origin, we were able to identify those that correspond to tax haven locations.

[2] Pre-tax income is calculated by deducting from the revenue all the operating costs, expenses, depreciation, amortization and interest.

The list of business groups and their members is publicly available through the Internal Revenue Service (IRS) website. For the aim of this research, this IRS definition is applied. However, individuals are excluded from the dataset, given that the nature of business group firms differs from that of individuals in tax structure and obligations. Hence, we study income-shifting existence among firms that are members of a business group.

Firms must file their tax return in the Tax Form 101. Financial data includes balance sheet, income statement and tax reconciliation information for each firm in every year. These information is used to construct the required variables for the analysis (Appendix available upon request). The original dataset contains information of 79,782 observations. Only active companies with complete information on the variables of interest are considered. Also, firms in the financial, real state, and some other service industries are excluded. After these considerations, the relevant data set includes 16,218 firms.

5. Results

a. Descriptive statistics

Table 2 reports the sample distribution of firms by industry and group affiliation status. Industry classification is based on the 1-digit ISIC Code from the United Nations Statistical Office that is also applied as a classification system for Ecuadorian firms. The wholesale and retail trade industry has a significant share of the firms followed by manufacturing and agriculture. These shares vary between business group and stand-alone firms where the trade industry share is smaller while manufacturing and agriculture are higher.

Table 2: Firm's Sample Distribution by Industry and Group Affiliation Status

	Stand-alone		BG		Total	
Industry	**N**	**%**	**N**	**%**	**N**	**%**
Agriculture, forestry and fishing	4,922	10.84	595	18.4	5,517	11.34
Mining and quarrying	630	1.39	96	2.97	726	1.49
Manufacturing	7,033	15.48	762	23.56	7,795	16.02
Electricity, gas, steam, etc.	204	0.45	18	0.56	222	0.46
Water supply; sewerage, etc.	324	0.71	24	0.74	348	0.72
Wholesale and retail trade	21,294	46.88	1,163	35.96	22,457	46.16
Transportation and storage	6,309	13.89	231	7.14	6,540	13.44
Accomm. and food services	1,389	3.06	141	4.36	1,530	3.14
Information and communication	2,154	4.74	105	3.25	2,259	4.64
Education	603	1.33	36	1.11	639	1.31
Arts, entertainment and rec.	144	0.32	36	1.11	180	0.37

Other service activities	414	0.91	27	0.83	441	0.91
Total	45,420	100	3,234	100	48,654	100

Notes: N denotes the number of observations. The industry classification is based on the 1-digit ISIC code from the United Nations Statistical Office.

The univariate statistical analysis of the MTR is reported in Tables 3. There are small but significant differences between Business Group and Stand-alone firms. The average stand-alone firm has a higher MTR than the comparable BG firm in the corresponding profitability level. This difference becomes negligible as profitability increases. In the first quartile (less profitable firms), the value of the MTR is on average around 0.15 and the share of firms with the maximum statutory rate is significantly smaller than in the upper quartiles. This result doesn't support the hypothesis of tax-induced income shifting as we don't observe changes in the difference of BG and stand-alone firms average MTR for different levels of profits.

Table 3: Comparison of the Marginal Tax Rates Between BG and Stand-Alone Firms

Pretax profitability		BG	Stand-alone	Difference (t-stat)
1st quartile	MTR	0.085	0.112	0.028 (6.23)***
	N	642	7,974	
	Max MTR	14	17	
	(Max ratio)	(1.75%)	(0.17%)	
2nd quartile	MTR	0.168	0.176	0.008 (2.23)**
	N	588	8,645	
	Max MTR	11	42	
	(Max ratio)	(1.41%)	(0.37%)	
3th quartile	MTR	0.183	0.196	0.013 (4.56)***
	N	627	8,513	
	Max MTR	9	57	
	(Max ratio)	(0.97%)	(0.47%)	
4th quartile	MTR	0.194	0.203	0.009 (2.98)***
	N	422	7,384	
	Max MTR	9	47	
	(Max ratio)	(1.24%)	(0.41%)	
Total	MTR	0.153	0.172	0.019 (9.33)***
	N	2,279	32,516	
	Max MTR	43	163	
	(Max ratio)	(1.33%)	(0.36%)	

Notes: Pretax profitability is pre-tax income to total assets and MTR denotes the marginal tax rate. N is the number of observations, and Max MTR is the number of observations whose MTR is the maximum statutory tax rate each year. Max ratio is the percentage of Max MTR. ∗, ∗∗ and ∗∗∗ indicate two-tailed significance levels of 0.1, 0.05 and 0.01, respectively.

Table 4 shows the descriptive statistics for the variables of interest in the overall sample, group, and stand-alone status. Taxable income and net income are standardized by total assets; while exports, tax expense and advertising expenses are

standardized by sales. Leverage is the ratio of total liabilities to total assets. Total assets are adjusted for inflation by using the Consumer Price Index (CPI). ETR is the effective tax rate, calculated as tax bill divided by pre-tax income, MTR is the marginal tax rate standardized by the maximum statutory rate each year. Exports and Advertisement are defined as exports over sales and advertisement expense to sales, respectively. THShare is the share of the firm that is owned by shareholders located in tax-haven countries.

On average, groups firms compared to stand-alone are bigger in size, export more, exhibit a higher tax expense, pre-tax return on assets and more taxable income, as there are significant differences in the mean value of these variables. On the other side for, net income variables, Leverage and advertisement expense there are no significant differences in the mean values. The marginal and effective tax rates are lower in group firm's and there are significant differences. The share of tax-haven ownership (THShare) is significantly different for group and stand-alone firms.

Table 4: Descriptive statistics of relevant variables

	All firms	Group	Stand-alone	Difference	t-statistic
Pre-tax return on assets	0.011	0.053	0.008	-0.046***	-5.06
Taxable income (EBT)	339,409	3,224,655	133,974	-3,090,682***	-19.18
Net income	0.021	0.025	0.021	-0.004	-0.27
Tax bill	0.123	0.386	0.104	-0.282**	-2.50
Leverage	0.616	0.582	0.619	0.036	1.24
Total assets[a]	3,721	31,300	1,759	-29,541***	-59.14
Export	0.034	0.0592	0.033	-0.027***	-8.66
Advertisement	0.025	0.0439	0.024	-0.021	0.86
MTR	0.719	0.6469	0.724	0.077***	9.12
ETR	0.754	0.7003	0.757	0.057***	8.69
TH	0.023	0.1020	0.017	-0.045***	-21.51
THshare	0.015	0.0570	0.012	-0.045***	-21.5
N (firms)	16,218	1,078	15,080		

The table displays mean values for the variables, by total sample, group, and stand-alone firms respectively. Total assets are presented in millions of US dollars. ∗, ∗∗ and ∗∗∗ indicate two-tailed significance levels of 0.1, 0.05 and 0.01, respectively, using t-tests for the mean.
[a] Total assets are reported in thousand dollars.

b. Regression results

Table 5 presents the results from the regression analysis that provides evidence to assess the hypothesis of tax-induced income shifting. The basic specification is described in equation (1) with 4 variations reported below, that use alternative profitability measures, Marginal or Effective Tax rates, and include different regressors.

In specification A, the effective tax rate has a positive and significant effect on profitability (measured by pretax return on assets), with a coefficient of 0.21. The sensitivity of firm profitability to the effective tax rate is lower for business group firms than stand-alone firms, as the interaction term between business group indicator and the marginal tax rate is negative and significant. The effect is -0.07 for a given tax rate, that is, the tax response coefficient for BG firms is about 33% lower than that of comparable stand-alone firms.

Table 5: Regression Results of Firm Profitability vs. Tax Rate

Variables	A	B	C	D
MTR	0.2226***	0.2184***	0.2133***	0.2102***
	(0.0073)	(0.0070)	(0.0066)	(0.0063)
BG*MTR	-0.0965***		-0.0685***	
	(0.0188)		(0.0169)	
TH*MTR		-0.0973***		-0.0870***
		(0.0297)		(0.0267)
BG	0.0643***		0.0590***	
	(0.0159)		(0.0144)	
TH		0.0260***		0.0787***
		(0.0260)		(0.0238)
LnAssets	0.0150***	0.0146***	0.0142***	0.0143***
	(0.0014)	(0.0013)	(0.0012)	(0.0011)
Leverage	-0.0050	-0.0050	-0.0053	-0.0053
	(0.0051)	(0.0051)	(0.0052)	(0.0052)
Advertisement	-0.0051**	-0.0051**	-0.0057**	-0.0057**
	(0.0025)	(0.0025)	(0.0026)	(0.0026)
Exports	0.1115***	0.1105***	0.1104***	0.1097***
	(0.0111)	(0.0111)	(0.0100)	(0.0100)
IndProf	1.3706***	1.3707***	1.3818***	1.3821***
	(0.0311)	(0.0311)	(0.0264)	(0.0264)
Cons	-0.4226***	-0.4155***	-0.4025***	-0.4010***
	(0.0192)	(0.0186)	(0.0167)	(0.0162)
N	34,795	34,795	48,654	48,654
Firms	12,818	12,818	16,218	16,218
F-value	532.59	531.60	660.53	658.15
(p-value)	0.0000	0.0000	0.0000	0.0000
R^2	0.2142	0.2140	0.2027	0.2026

Specification A presents coefficient estimates in an OLS regression of Pre-tax income return on assets on the marginal tax rate, standardized by the maximum statutory rate. Specification B shows the results of a variation on the regression analysis including the tax haven ownership indicator, and an interaction with the MTR. Specification C uses the effective tax rate (ETR) as an independent variable, instead of MTR. Specification D is similar to B but using the ETR. The regressions are estimated with clustered standard errors by firm and time. Standard errors are in parenthesis. ∗, ∗∗ and ∗∗∗ indicate two-tailed significance levels of 0.1, 0.05 and 0.01, respectively.

On average, profitability is over 6 percentage points higher for BG than for stand-alone firms. This is a stylized fact in most economies that exhibit business group structures. Size, measured by the natural log of assets, is positively related to

profitability, that is, larger firms are more profitable. The exports coefficient is positive and significant, that is firms that export might be more profitable.

In specification B, we include an indicator of foreign ownership in the firm, specifically in tax haven countries measured as TH and an interaction term between this indicator and the tax rate. The results contribute to support the hypothesis of profit shifting in firms that have shareholders located in these jurisdictions, at a higher scale, and regardless of business group affiliation. Similar results are obtained when using the effective tax rate as independent variable in the regression (Specifications C and D). The effect of the ETR on profitability differs between BG and stand-alone firms. Moreover, for firms with tax haven located shareholders, the difference is almost 9 points.

The inclusion of these variables responds to specific issues of the Ecuadorian taxation context. The principles that govern most of tax treaties imposed incentives to transfer income into low tax jurisdictions or to limit the tax paid in some transactions. Hence, companies plan where to establish the fiscal residence of their headquarters and cost centers to transfer income and adapt transactions to comply with the different types of income subject to the treaties. The tax planning strategies extend to decisions of which affiliate must have a foreign shareholder. In Ecuador, through the years more regulations have been imposed regarding tax havens. Companies use transfer pricing to shift profits to those jurisdictions. Nowadays, the tax administration has focused the audit process to those transactions and the cost of report and support those transactions may have increased. Next, we estimate the same models using Panel Data techniques and find similar results.

Table 6: Panel Data Estimation Results of Firm Profitability vs. Tax Rate

Variables	E	F	G	H	I	J
MTR	0.216***	0.213***	0.218***	0.227***	0.223***	0.229***
	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)
BG*MTR	-0.077***		-0.070***	-0.102***		-0.092***
	(0.017)		(0.017)	(0.018)		(0.019)
TH*MTR		-0.101***	-0.088***		-0.110***	-0.085***
		(0.024)	(0.026)		(0.028)	(0.030)
BG*TH*MTR			0.006			-0.016
			(0.029)			(0.031)
BG	0.065***		0.059***	0.068***		0.061***
	(0.015)		(0.015)	(0.016)		(0.016)
TH		0.089***	0.077***		0.089***	0.076***
		(0.023)	(0.023)		(0.025)	(0.025)
LnAssets	0.014***	0.014***	0.014***	0.015***	0.015***	0.015***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Leverage	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Advertisement	-0.005**	-0.005**	-0.005**	-0.005**	-0.005**	-0.005**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Exports	0.121***	0.120***	0.121***	0.115***	0.114***	0.114***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
IndProf	1.399***	1.400***	1.399***	1.392***	1.392***	1.391***
	(0.025)	(0.025)	(0.025)	(0.030)	(0.030)	(0.030)
Cons	-0.404***	-0.402***	-0.404***	-0.429***	-0.422***	-0.429***
	(0.017)	(0.016)	(0.017)	(0.019)	(0.019)	(0.019)
N	48,654	48,654		34,795	34,795	
Firms	16,218	16,218		12,818	12,818	
Wald chi^2	5,691.86	5,677.47		4,607.46	4,599.87	
(p-value)	0.000	0.000		0.000	0.000	

Specifications E, F and G use the Marginal Tax Rate; Specifications H, I and J use the Effective Tax Rate as independent variable. The regressions are estimated with clustered standard errors by firm. Standard errors are in parenthesis. ∗, ∗∗ and ∗∗∗ indicate two-tailed significance levels of 0.1, 0.05 and 0.01, respectively.

The previous results hold supporting the hypothesis of profit shifting among group members as well as for firms with shareholders located in tax haven countries. Specifications G and J, include an additional interaction term, that is the effect of being a business group member and having ownership in tax havens. This interaction is not significant in the models.

In general, the results of this analysis support the hypothesis of tax elusion in Ecuadorian Business Groups. This could be of importance since the ownership in pyramidal structures facilitates the tunneling of resources from one firm in business groups to other members (Bertrand et. al, 2002) and allow the firms access to other channels in foreign countries through legal use of certain tools, such as management fees, royalties, financial transactions, reimbursement of expenses, transfers of tangible and intangible assets and licensing.

d. Endogeneity issues

The proposed estimation may present some endogeneity issues that arise from the setting of the model, and affect the marginal tax rate and the choice of business group affiliation. To explore this issue, we compare the variability in Marginal Tax Rates between Business Group and Stand-alone firms, in a similar manner as Jung et al. (2009) who argue that income shifting can smooth the variation in the MTR of BG firms compared to others.

We assume that the choice of business group membership is exogenous when including it as an explanatory variable of the model. However, reverse causality is another issue that can be introducing bias in the results, as well as some firm characteristics that may be endogenous to BG affiliation. We correct for the potential endogeneity by using a two-stage least squares (2SLS) estimation approach.

In the first stage, we use a probit model of the choice of BG affiliation. As determinants of Business Group affiliation we include size, debt level, an indicator variable of total domestic ownership, a Herfindahl index ownership concentration measure, and age of the firm in years. Size and leverage are usually considered as determinants in this setting. The domestic ownership and the ownership concentration measures are included as controls in this regression, for the family nature of the Ecuadorian Business Groups that also makes them highly concentrated. In a country with a scarcely developed stock market, few movements in firm ownership are realized, with some exceptions.

Table 7.A: Probit Regression for the Choice of BG Affiliation

Variables	*Coefficient*	*Standard Error*
Size	0.417***	0.026
Debt	-0.104***	0.018
DomesticSh	-0.004***	0.001
Concentration	0.000***	0.000
Age	0.006***	0.002
N	31,733	

Wald Chi2	719.39
(p-value)	(0.0000)
R^2	0.2216

The dependent variable, BG, is a dummy variable equal to 1 if a firm is affiliated with a business group, otherwise 0. ∗, ∗∗ and ∗∗∗ indicate two-tailed significance levels of 0.1, 0.05 and 0.01, respectively.

Table 7.B: Endogeneity Test Using the Predicted Probability of Choosing BG Affiliation

Variables	*Coefficient*	*Standard Error*
MTR	0.268***	0.009
Bghat x MTR	-0.821***	0.053
BGhat	0.574***	0.055
Size	0.017***	0.002
Leverage	-0.004	0.005
Advertisement	-0.002	0.003
Export	0.109***	0.012
Ind prof	1.384***	0.033
N	31,733	
Firms	11,582	
F-value	486.50	
(p-value)	(0.0000)	
R^2	0.2192	

The regression is estimated with clustered standard errors by firm and time. *, ** and *** indicate two-tailed significance levels of 0.1, 0.05 and 0.01, respectively.

The results reported in Table 7.A show that the probability of affiliation to a BG in Ecuador is positively related with firm size, firm ownership concentration, and age. In contrast, the higher debt level, less likely is the firm to be affiliated with a BG, and similarly for the domestic share of ownership. In the second stage regression, the results seem to be very similar to the original specification. The coefficient on the instrument is negative and highly significant, as well as other covariates included. Hence, the robustness of the results to the endogeneity issue is confirmed.

6. Discussion

The income shifting hypothesis has been studied in different settings, such as the analysis of changes in corporate tax rate between jurisdictions, and the differences in marginal tax rates between domestic and foreign affiliates. This study contributes to the analysis of income shifting in the same jurisdiction, specifically in a developing economy business groups, where there are still weaknesses in tax control plans.

While, the results provide significatn evidence that firms use tax planning strategies to minimize the tax burden through income shifting, they are not definitive yet. There are still limitations with the databases that should be improved in the future as well as work on other complementary or alternative specifications that allow us to obtain a broader picture about how business groups and multinationals determine profit shifting.

Another limitation for the study is the need to exclude financial institutions that usually have ties with business groups, and usually play a significant role in the trades of BG. Data for these firms are not available from the same source and in the same format as other companies. However, they are included in the list of Business Groups that the IRS publishes, and might be included in the future.

The earnings management literature assess the use of accounting techniques within the boundaries of compliance to manipulate the results in the financial statements. In Ecuador, the lack of capital markets and the accrual accounting system generate incentives for earnings management. Future changes in the Form 101 would allow to have better information on permanent and temporary differences, to identify the effects of tax planning through those thecniques, leaving the door open for further research.

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