Briozzo, Anahí Eugenia; Albanese, Diana

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Voluntary audit, investment, and financing decisions in Latin American small and medium enterprises

Anahi Briozzo [a,*], Diana Albanese [b]

[a] Departamento de Ciencias de la Administración, Universidad Nacional del Sur (DCA-UNS), IIESS (UNS-CONICET), San Andrés 800, 8000, Bahía Blanca, Argentina
[b] Departamento de Ciencias de la Administración, Universidad Nacional del Sur (DCA-UNS), San Andrés 800, 8000, Bahía Blanca, Argentina

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ABSTRACT

We study the effects of voluntarily contracting an external audit in a sample of small and medium-sized enterprises in the four largest Latin American countries: Argentina, Brazil, Colombia, and Mexico. The evidence shows that, for companies exempt from mandatory auditing, audited financial statements positively affect the access to bank financing, fixed assets investment, and the percentage of working capital financed with suppliers. The results contribute to an active policy debate on the role of the voluntary audit regime for small and medium enterprises.

1. Introduction

Small and medium-sized enterprises (SMEs)[1] increasingly require information as a fundamental element for their investment and financing decisions (Berger & Udell, 1998). Financial statements (FS) reflect the asset situation of a company at any given time, the results of its operations and the cash flow over a given period. Because users do not always have the right knowledge to read and interpret the information of these reports, the opinion of an independent auditor provides reasonable certainty about whether the FS are free of mistakes or significant distortions (Clatworthy & Peel, 2013).

However, due to certain global crises, audit reports do not always add credibility to the FS (Bellovary, Giacomino, & Akers, 2006; Citron & Taffler, 2001). Another factor to consider is the information opacity presented by SMEs, particularly in emerging countries, where the relevance of accounting information is lower than in more developed economies. The usefulness of FS is conditioned by the level that they reflect the entire operations of the company. In small firms in emerging countries, some of the company's activities are usually performed in an unregistered way, so the perceived usefulness of an external audit for these firms can be lower than in developed countries. Financial reporting quality decreases with incentives to minimize earnings for tax purposes (Chen, Hope, Li, & Wang, 2011).

Taking into account this differential context, the objective of this paper is to study whether the effects of voluntary external audits vary in developing countries compared to what has been observed in developed economies. In particular, we

* Corresponding author.
E-mail addresses: abriozzo@uns.edu.ar (A. Briozzo), dalbanese@uns.edu.ar (D. Albanese).

[1] Our SME abbreviation is not the same as the IASB's definition of Small- and Medium-Sized Entities.

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analyze the effects of voluntary audit on the investment and financing decisions of SMEs in the four largest Latin American countries: Argentina, Brazil, Colombia, and Mexico.

We consider the voluntary external audit of FS as a signal of financial reporting credibility (Hope, Thomas, & Vyas, 2011; Van Caneghem & Van Campenhout, 2012). We obtain our data from the World Bank's Enterprise Surveys (WBES), considering only those companies subject to voluntary audits in their respective countries. The potential endogeneity of the decision to audit FS is addressed through different econometric models (instrumental-variables regression and seemingly unrelated bivariate probit) apart from the addition of several control variables, such as firm age, size, legal form, ownership, and asset structure, among others.

Our study contributes to the existing literature in several ways. First, we study the impact of the external audit choice in privately held SMEs located in emerging countries, while a large part of the previous literature analyzes firms located in developed economies (Hope et al., 2011 is a notable exception). This group of countries is of particular interest given that emerging economies are characterized by weaker institutions (Organization for Economic Co-operation and Development OECD (2018)), greater extension of the informal economy, and larger information asymmetries, thus giving rise to the question of whether audit effects vary from those observed in developing countries. Second, we focus on the value of the external audit *per se* by studying only those firms subject to the voluntary audit regime. Third, we analyze the observable effects of the audit report (access to bank loans and use of trade credit), while many previous studies analyzed the perceptions of FS users. Last, to the best of our knowledge, this is the first work that analyses whether external voluntary audits have an impact on investment decisions. The results contribute to an active policy debate on the relevance and characteristics of the voluntary audit regime for SMEs, especially in Latin American countries.

The remainder of this paper is organized as follows. Section 2 presents the theoretical framework and the background, after which Section 3 describes the methodological aspects. Then we detail the results of the bivariate and multivariate analysis, followed by our conclusions.

2. Theoretical framework and background

2.1. The effects of the voluntary audit report

One of the most prominent characteristics of SMEs is information opacity. Moreover, many smaller companies do not have audited FS that can be presented to external fund providers. As a result, small businesses often cannot credibly convey their quality (Berger & Udell, 1998).

The FS issued by the board of an entity are accounting reports that provide information to users with dissimilar interests in the economic, financial, and governance situations faced by a company. Financial information should be useful for making economic decisions by the main users: investors, lenders, and creditors (International Accounting Standards Board, IASB, 2010).

The audit report is the communication of the findings made by an independent professional about the reasonableness of the information contained in the FS (Arens, Elder, & Beasly, 2007). The opinion of an independent auditor provides credibility by noting that the FS do not contain significant errors or irregularities. Audited FS reduce the problem of adverse selection and moral hazard between internal and external users (Jensen & Meckling, 1976) and act as a sign of their quality (Van Tendeloo & Vanstraelen, 2008).

Evidence from the small business literature on lending shows that audited FS of small firms are crucial in the bank lending decision (Collis, Jarvis, & Skerratt, 2004). The causality for this relationship has been explained through different channels. External audit improves the predictive ability of reported net income on future cash flows, which results in a lower cost of debt (Minnis, 2011). An audit reduces the need for external investors to expend resources in verifying the faithfulness of the firm's financial position and performance in the FS, which is reflected in a lower cost of debt (Cassar, 2011). "Further, as audits provide assurance through comprehensively evaluating the firm's accounting operations and controls, auditors can provide benefits to lenders beyond financial reporting. For example, validating the effectiveness of how cash is transferred and monitored throughout the firm reduces the likelihood of fraud by management." (Cassar, 2011, p. 524).

Prior studies on this subject can be classified into two groups: the direct study of voluntary audit effects through observable outcome variables, and the indirect analysis through the perceptions of internal and external FS users. In the first group, we find evidence in favor of the value of the audit report as a mechanism for reducing information problems in access to credit. Audited FSs are associated with lower debt costs (Minnis, 2011 for US firms; Kim, Simunic, Stein, & Yi, 2011 for Korean firms), higher financial leverage (Van Caneghem & Van Campenhout, 2012 for Belgian SMEs), and higher credit ratings for private companies (Dedman & Kausar, 2012; Lennox & Pittman, 2011, both for UK firms).

Within the line of research of perceptions of FS users, Bessell, Anandarajan, and Umar (2003) have noted that banks do not seem to give additional importance to the auditor's report when rating a client as they currently have a set of useful information alternatives that they use meaningfully, which allow to conduct their own investigations (Church, Davis, & McCracken, 2008). Moreover, on several occasions, observers have stated that they are not satisfied with the ability of the accounting profession to warn on threats of customer failure (Bellovary et al., 2006; Citron & Taffler, 2001).

The audit report contains relevant information when it is contrary to favorable financial expectations, when analyzing going concern decisions (Guiral-Contreras, Gonzalo-Angulo, & Rodgers, 2007).These authors obtained conflicting results in that, on the one hand, credit analysts do not seem to give too much importance to unqualified audit reports if they have

additional information that is unfavorable for the client. On the other hand, a report with a qualified opinion can cause a change in attitude towards the evaluation of the client requesting the credit.

A study of the opinions of the directors of UK private limited companies showed that the main perceived benefits of having the accounts audited were the verification of accounting information, the improvement in internal controls, and the positive effect on the credit rating score (Collis, 2008). However, 30 % of the firms considered that the costs of the audit outweigh the benefits.

Hope, Thomas, and Vyas (2011) have used the WBES database to study private firms from 68 countries and have found that the external audit is related to fewer perceived external financing constraints. Our work differs from Hope et al. (2011) in that their study includes all private firms and does not consider whether the firm's audits are voluntary or compulsory. This a relevant point because in the case of mandatory audits, its signaling effect is lost.

For Spanish SMEs subject to the voluntary audit regime, smaller firms and non-family businesses value auditing the most (Montoya-del-Corte, Fernández-Laviada, & Martínez-García, 2014). A positive relationship exists between the owner's perception of the external auditor's reliability and competence and the perceived benefits of the audit for small private enterprises in Finland (Ojala, Niskanen, Collins, & Pajunen, 2014).

Sormunen (2014) has conducted a qualitative exploratory study of the perceptions of bank credit analysts on the use of audit reports in the FS of SMEs that meet the status of an ongoing enterprise. Agreeing with authors such as Niemi and Sundgren (2012); Sormunen (2014) has considered that banks form one of the main user groups of the FS of these companies to satisfy basic requirements in making financing and investment decisions. However, from the interviews with credit officers of Finnish financial institutions, the author was aware that they would not accept unaudited FS. Nevertheless, some give relatively little importance to the audit report because they believe that it provides more didactic information on the audit task than reliance on financial information.

Given the previous evidence on the effects of the audit report on external fund providers, we propose the following hypotheses[2] :

H1. Businesses with voluntary audits make greater use of debt provided by financial institutions.

H2. Businesses with voluntary audits make greater use of trade credit from their suppliers.

For internal decision-making, prior research has focused on the effect of financial information quality on investment decisions. Better accounting information quality reduces information asymmetries and leads to more efficient investment (Biddle & Hilary, 2006). For a sample of large US firms, McNichols and Stubben (2008) have found that firms that manipulate earnings make suboptimal investment decisions (in this work investment opportunities are measured through Tobin's Q). Chen et al. (2011) used the WBES database (a large sample of private firms from 21 emerging countries) and found that financial reporting quality has a positive effect on investment efficiency.

The effect of audit quality on earnings management has also been associated with investment opportunities. These studies focus on firms with audited FS and define audit quality as hiring a Big 4 auditing firm (Lai, 2009) or audit tenure (Lenard & Yu, 2012 for Chinese firms).

In particular, given that information asymmetries lead to financial restrictions for SMEs, investment inefficiencies appear as underinvestment problems (Petersen & Rajan, 1994). In a context of concentrated ownership and poor investor protection, controlling shareholders can easily expropriate wealth from minority shareholders and profit from private benefits of control (Shleifer & Vishny, 1997). Audits can be employed as a monitoring mechanism to mitigate agency problems arising from different types of controlling shareholders (Ali & Lesage, 2013).

Thus, for the universe of firms subject to a voluntary audit regime, we expect that the decision to perform an external audit would act as a positive signal not only for outside fund providers, but also for minority shareholders, leading to a lower marginal cost of capital, which allows the profitable investment opportunities set to be expanded. Consequently, we propose the following hypothesis:

H3. Businesses with voluntary audits have larger investments in fixed assets.

2.2. Background on the voluntary audit regime in Argentina, Brazil, Colombia, and Mexico

An audit report can be defined as the written opinion of an independent accountant who has carried out his task with professional expertise and sufficient skepticism, and who intends to express an opinion on the reasonableness of an entity's patrimonial, economic, and financial situation. The objective of the report is to reduce uncertainty about information quality.

Many countries have adopted a system of voluntary audits where only public (listed) companies, those regulated by the state, or large companies in general are obliged to present audited FS. Table 1 presents a summary of the requirements for a company to be subject to independent auditing in each of the countries under study; values are expressed in US dollars to standardize the comparison. The four studied countries have different rules regarding mandatory auditing requirements, with the strictest being in Argentina and the most flexible in Brazil.

[2] All hypotheses are stated in terms of the effect of the voluntary audit after controlling for other factors that can affect financing and investment decisions (i.e., ceteris paribus).

Table 1
Minimum requirements to be subject to mandatory auditing.

Country	Gross Assets	Gross Incomes	Employees	Legal Form
Argentina	N/A	N/A	N/A	Shareholding companies and partnerships
Brazil (3)	118,988,597	148,735,746	N/A	Public firms Large shareholding companies and limited liability companies
Colombia (1)	1,401,017	840,610	N/A	Shareholding companies
Mexico (2)	5,692,037	2,846,017	300	N/A

Note: Values expressed in US dollars according to the mean exchange of the year of the survey: (1) exchange rate 1837.95 C/U, (2) exchange rate 12.229 M/U (3) exchange rate 2.017 R$/U$. N/A means Not Applicable.

The four studied countries all have different regulations regarding voluntary audit regimes (Table 1. For example, Brazil has the most flexible requirements. On the other hand, the regime is stricter in Argentina. The new Argentinian Unified Civil and Commercial Code Law 26994, that came into effect during 2015, states in its article 320 that:

> All private legal persons and those who carry out an organized economic activity or are the owners of a business (belonging to the commercial, industrial, agricultural or service sector) are required to keep accounts. Any other person can keep accounts if they request their registration and the authorization of their records or the initiation of books, as established in this Section (. . .) Those activities that due to the volume of their business are inconvenient to subject to such duties may also be exempted from accounting, if it is determined by each local jurisdiction.

This has brought greater uncertainty to those who are actually required to file audited FS in Argentina. For the purposes of our analysis and by following customs and practices, we consider that sole proprietorship firms are the only businesses exempted from the mandatory audit regime in Argentina.

Another relevant aspect to consider in SMEs is the extensive use of creative accounting, primarily with the objective of reducing income taxes (Baralexis, 2004). The emerging countries in the sample can be characterized as having low investor protection and bank-oriented financial systems, which previous studies have associated with a limited role of accounting information and lower financial information quality (Ali & Hwang, 2000; Ball, Kothari, & Robin, 2000).

3. Methodology

3.1. Sources of data, population, and sample

For the analysis of data at the firm level, we used the WBES. This is a cross-sectional firm survey conducted in 148 countries by the World Bank, which is available free of charge for academic purposes. Data are used to create statistically significant business environment indicators that are comparable across countries (World Bank, 2018). This database has been used in previous studies, such as Hope et al. (2011) and Chen et al. (2011), and includes information on small and medium-size private firms. Furthermore, the WBES database allows us to identify those firms exempt from the mandatory audit regime in each country (through sales, assets, legal form, and employees), and to collect information on the dependent variables (sources of financing and investment decisions), and control variables without having to rely on proxies.

The database from the year 2010 is used for Argentina, Mexico, and Colombia, and 2009 for Brazil.[3] These four countries represent 95 % of gross domestic product, 81 % of the population, and 97 % of the aggregate industrial value of all Latin America (World Bank, 2015).

We are interested in whether the prior year's FS were audited by an independent accountant. So as indicated in Table 1, the analysis is performed on those companies exempted from the compulsory external auditing regime in each country[4] . Using data from one year for each firm, we estimate cross-sectional models.

The composition of the sample is shown in Table 2, and nearly 30 % of the companies opted to obtain an external audit. Due to the restricted data availability of certain variables, all companies in the sample belong to the manufacturing sector.

3.2. Operational definition of variables

We consider several measures for debt use by financial institutions (H1), including binary measures (dummy variables), such as active credit at the moment of the survey (Active credit) and applied for credit the previous year (Applied for credit), as well as continuous measures through the percentage of fixed assets and working capital financed with these funds. Table 3 presents the dependent (outcome) variables and their definitions.

[3] These are the most recent panel data available for these countries. For Argentina, a new database for 2017 was released on April 2018 and, for Colombia, in July 2018, but new information is still not available for Mexico and Brazil. To preserve the uniformity of global economic conditions for the studied countries, we analyze the 2010 data for all countries.

[4] The analyzed sub-sample consists of all firms in the general WBES database, excluding those enterprises that are subject to mandatory auditing. We identify sample firms after considering the restrictions on assets, gross income, employees, and legal form shown in Table 1.

Table 2
Sample Composition.

Country	Provided Audited Financial Statements		Total
	Yes	No	
Argentina	40.52 %	59.48 %	80
Brazil	31.03 %	68.95 %	921
Colombia	37.37 %	62.63 %	195
Mexico	18.50 %	81.50 %	568
Total	30.61 %	69.39 %	1,803

Note: For Argentina, only sole proprietorship companies are considered. As indicated in the section on the theoretical framework and background, although they are not legally exempt from compulsory external audit, in practice it is not performed.

Table 3
Operational definition of dependent variables.

Hypothesis	Variable	Definition
H1	Active credit	Binary variable. Has a line of credit or loan from financial institution (1= yes, 0 = no).
H1	Applied for credit	Binary variable. Applied for any loans or lines credit in the last complete fiscal year (1= yes, 0 = no).
H1	Fixed assets financial institutions	Continuous variable. Percentage of fixed assets funded by financial institutions in the last complete fiscal year.
H1	Working capital financial institutions	Continuous variable. Percentage of working capital funded by financial institutions in the last complete fiscal year.
H2	Working capital Suppliers	Continuous variable. Percentage of working capital financed by suppliers in the last complete fiscal year.
H3	Fixed assets	Binary variable. Acquired fixed assets in the last complete fiscal year (1= yes, 0 = no).

Table 4
Operational definition of control variables.

Variable name	Definition	Audited FinS	Outcome variable
Firm age	Continuous variable. Difference between the year of the survey (2010) and year operations began.	x	x
Employees	Continuous variable. Number of full-time employees.	x	x
Sales	Continuous variable. Sales in millions of dollars.		x
MV Fixed assets	Continuous variable. Market value of fixed assets in millions of dollars		x
Domestic Sales	Continuous variable. Percentage of sales from domestic market.		x
Competition	Binary variable. The competition structure is a monopoly (1= yes, 0 = no).		x
Informal sector competition	Binary variable. Owner considers that practices of competitors in the informal sector is a major or very severe obstacle (1= yes, 0 = no).		x
Female owner	Binary variable. Among firm owners, are there any females? (1= yes, 0 = no).	x	
Ownership concentration	Continuous variable. Percentage of firm owned by the largest owner or owners	x	x
Innovation	Binary variable. Over the last three years, the firm introduced a new or significantly improved product (1= yes, 0 = no).		x
Region	Binary variable. The region's gross domestic product is below the country average. (1= yes, 0 = no).	x	x
Country	Four binary variables are defined, 1 per country.		x
Legal form	Binary variable. Legal form adopted by company implies limited equity responsibility (1= yes, 0 = no).		x

Notes: The column AuditedFinS shows whether the variable is included as a regressor in Eqs. (1) and (4) (dependent variable: AuditedFinS).The column Outcome shows whether the variable is included as a regressor in Eqs. (2) and (3). See Table 3 for list of dependent variables.

Financial information quality has been measured in prior studies through earnings management and discretionary accruals (Chen et al., 2011), while audit quality has been measured using proxies such as Big 4 auditing firms (Lai, 2009), large market shares (Dunn & Mayhew, 2004), and audit tenure (Lenard & Yu, 2012). Our independent variable is AuditedFinS, defined as financial statements audited by an external auditor,with a binary variable that takes a value of 1 when the characteristic is present.

The literature on capital structure and bank financing indicates that several variables are considered by external fund suppliers when defining the granting of a credit. Factors such as size, firm age, asset structure, and owner characteristics are taken into account (Ang, 1991; Berger & Udell, 2002; Briozzo, Vigier, & Martinez, 2016; Chittenden, Hall, & Hutchinson, 1996; Jensen, 1986; Jensen & Meckling, 1976). Considering this previous evidence, we include different characteristics as control variables: size (firm age, number of employees, and sales), asset structure (fixed assets at market value), competition (percentage of sales in the domestic market, structure of competition, and informal sector competition), structure of own-

ership and administration (percentage of ownership of the largest owner and legal form), innovation, and location (region and country). The operational definitions of these variables are presented in Table 4[5] .

3.3. Methods

First, we present a comparative descriptive study on the outcome variables of companies depending upon whether they choose to perform an audit. To check for significant differences, we use the Pearson test for binary variables and Student *t*-test for continuous variables. We also perform the analysis considering the weights of the stratified sampling for each country.

Considering the potential endogeneity of the variable AuditedFinS[6], for the multivariate analysis we use different econometric methods, depending on the nature of the dependent variable. For binary outcome variables (Table 6), estimates were first made using the maximum likelihood of two probit equations in the form of seemingly unrelated bivariate probit. The first equation estimates the resulting variable, and the second equation estimates the probability of having audited FS. Following Greene (2003), this model can be written as:

$$y_1^* = X_1\beta_1 + u_1,\ y_1 = 1 \text{ if} y_1^* > 0,\ 0 \text{ otherwise} \tag{1}$$

$$y_2^* = X_2\beta_2 + \gamma y_1 + u_2\ ,\ y_2 = 1 \text{ if} y_2^* > 0,\ 0 \text{ otherwise} \tag{2}$$

where

$$\begin{pmatrix} u_1 \\ u_2 \end{pmatrix} \sim N\left\{ \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \rho \\ \rho & 1 \end{pmatrix} \right\}$$

Where $\rho = cov(\ u_1,u_2)$.

The observable variables y_1, y_2 take value 1 if the corresponding latent variables y_1^*, y_2^* take positive values, and zero otherwise. In this case, AuditedFinS can be viewed as y_1 = 1, while y_2 is the outcome binary variable (i.e., Active credit, Applied for credit, and Fixed assets). Then, the effect of AuditedFinS on a binary outcome variable can be measured as:

$$Prob\left(y_1 = 1, y_2 = 1 X_1, X_2\right) = \Phi(X_1\beta_1 + \gamma y_1, X_2\beta_2\ ,\ \rho)$$

The regressor vectors for each equation are shown in Table 4.

Under the seemingly unrelated bivariate probit, both equations are seen as a system and must be estimated together if $\rho(rho) \neq 0$. The null hypothesis test of $\rho(rho) \neq 0$ is estimated under a likelihood ratio test, and in the case of non-rejection, both probit models can be estimated separately[7] . Estimates for all variables provided a non-significant rho (Table 6), for which a simple probit model is applied.

Therefore, our empirical strategy relies on first estimating a seemingly unrelated probit model that does not contain AuditedFinS as an endogenous dummy. This allows us to determine whether a joint estimation is appropriate. Then, we test the presence of exogeneity of $\rho(rho) \neq 0$ by applying maximum-likelihood simultaneous estimations of the two probit equations, a method also identified as recursive bivariate probit (Maddala, 1983; Maddala & Lee, 1976).

For the quantitative outcome variables (Table 7), we use instrumental-variables regression. Here, we first run a regression using the probability of having audited FS (Eq. (4)). Formally, the model is estimated by:

$$y_i = y_i\beta_1 + X_{1i}\beta_2 + u_i \tag{3}$$

$$y_i = X_{1i}\Pi_1 + X_{2i}\Pi_2 + v_i \tag{4}$$

where y_i is the dependent variable for the *i*th observation (outcome variable: percentage of fixed and working capital assets funded by financial institutions, and percentage of working capital financed by suppliers), y_i represents the endogenous regressor (AuditedFinS), X_{1i} represents the exogenous regressors included, and X_{2i} represents the excluded exogenous regressors. u_i and v_i are the error terms with mean zero, and the correlation between u_i and the elements of v_i is assumed to be nonzero. Since y_i is a binary variable, the estimation is done through limited-information maximum likelihood (LIML). The regressors of Eq. (4) (probability of having audited FS) are taken from Briozzo, Albanese, and Rivera (2015)[8] .

[5] A limitation of using this data is that financial statement information is restricted. So we do not have access to some potential control variables (financial ratios) used in prior studies.

[6] Endogeneity occurs when an explanatory variable is correlated with the error term, leading to biased estimations. In particular, some non-observable variables may influence both the probability of AuditingFinS (explanatory variable) and financing and investment decisions (dependent variables).

[7] If ρ = 0, then the log likelihood for the bivariate probit models is equal to the sum of the log likelihoods of the two univariate probit models. A likelihood-ratio test is then performed by comparing the likelihood of the full bivariate model with the sum of the log likelihoods for the univariate probit models.

[8] Briozzo et al. (2015) analyzed the determinants of contracting voluntary audits in Brazil, Mexico, Colombia, and Argentina using the WBES database. Their results indicate that the companies most likely to voluntarily contract an audit are characterized by being innovative (mainly those with registered patents), having a female top manager, having women being one of the owners, having a higher average term of their bank loans, and having a longer term of their sales credits. In turn, companies from regions with lower socio-economic development tend to have more voluntary audits.

Table 5
Bivariate analysis of dependent variables.

Dependent variable	Unaudited FinS (general) (1)	Audited FinS (general) (2)	Argentina Audited FinS (3)	Brazil Audited FinS (4)	Colombia Audited FinS (5)	Mexico Audited FinS (6)
Active Credit (BV)	61.60 %	62.82 %	40.58 %	64.79 %	48.68 %	62.82 %
Applied for credit***(BV)	55.34 %	88.87 %	23.14 %	94.58 %	38.86 %	34.6 %
Fixed assets financial institutions	35.07 %	43.64 %	9.51 %	45.18 %	38.18 %	11.22 %
Working capital financial institutions	25.71 %	24.05 %	4.53 %	25.60 %	16.22 %	7.84 %
Working capital suppliers	22.22 %	26.09 %	13.93 %	25.95 %	38.95 %	34.72 %
Fixed assets (BV)	66.00 %	67.49 %	30.85 %	69.75 %	66.69 %	46.12 %

Notes: For the binary variables (BV), we indicate the percentage of companies with a presence of the characteristic, in the total of unaudited companies (column 1) and audited in column 2, respectively. For the continuous variables, we show the mean calculated for the total of unaudited companies (column 1) and audited (column 2), respectively. Columns 3–6 indicate the values for each country, on the total number of companies audited. *, ** and *** indicate significant variables at the level of 10 %, 5 %, and 1 %, respectively.

Table 6
Multivariate analysis for binary outcome variables.

	Active Credit (H1)(1)	Applied for credit (H1) (2)	Fixed assets (H3)(3)
AuditedFinS	0.066*	0.075**	0.121***
	(0.070)	(0.042)	(0.000)
Brazil	0.172*	0.166*	−0.001
	(0.061)	(0.085)	(0.99)
Colombia	0.135	0.171*	−0.248***
	(0.151)	(0.089)	(0.009)
Mexico	−0.038	−0.042	−0.220***
	(0.670)	(0.651)	(0.009)
Applied for credit			0.189***
			(0.000)
Domestic Sales	−0.001	0.0003	−0.0005
	(0.633)	(0.841)	(0.638)
Competition	−0.020	−0.139*	0.025
	(0.806)	(0.071)	(0.672)
Informal sector competition	−0.013	0.058*	
	(0.670)	(0.060)	
Firm age	0.0003	0.002**	−0.003***
	(0.774)	(0.053)	(0.001)
Employees	0.001***	0.001***	0.001***
	(0.000)	(0.001)	(0.007)
MV fixed assets	−0.0003**	−0.0001	0.0003*
	(0.032)	(0.128)	(0.08)
Ownership concentration	0.0002	0.00003	0.0002
	(0.789)	(0.962)	(0.779)
Legal form	0.064	0.043	0.071
	(0.173)	(0.368)	(0.107)
Region	−0.002	−0.023	0.113**
	(0.995)	(0.624)	(0.010)
Prob > chi2	0.000	0.000	0.000
Likelihood-ratio test for rho=0	0.531	0.593	0.633

Notes: The marginal effects of the probit regression on the outcome variable are shown. For the binary variables, it is the effect of moving from 0 to 1. The last row of Likelihood-ratio test shows the p-value of testing the null hypothesis rho = 0 in a biprobit regression. P-values in parentheses. *, ** and *** indicate significant variables at the level of 10 %, 5%, and 1%, respectively. In all estimations, the omitted variables were not significant.

Subsequently, we perform the Durbin and Wu-Hausman tests, under which the null hypothesis is that y_i is exogenous[9] . If the null hypothesis is not rejected, it is more efficient to estimate $y_i$by means of ordinary least squares (OLS). In the estimates made, the null hypothesis of exogeneity is rejected only for the outcome variable working capital financed through suppliers (Table 7). Thus, we estimate the rest of the quantitative result variables by OLS.

4. Results

4.1. Bivariate analysis

Table 5 presents an analysis of whether there are statistically significant differences between audited and unaudited companies for the sample in general. The variables are also analyzed for audited companies by country.

[9] These tests are not available for the command ivregress liml in Stata, so we also estimated the model by GMM (general method of moments). The results are similar.

Table 7
Multivariate analysis for quantitative outcome variables.

	% fixed assets financial inst.(H1) (1)	% Working cap. financial inst. (H1) (2)	% working cap. Suppliers (H2) (3)
AuditedFinS	4.355	3.000	101.45*
	(0.647)	(0.755)	(0.082)
Brazil	15.836***	19.398***	
	(0.008)	(0.001)	
Colombia	17.407**	12.172*	
	(0.032)	(0.053)	
Mexico	4.597	5.676	
	(0.429)	(0.319)	
AuditedFinS #Brazil	7.674	4.365	
	(0.469)	(0.664)	
AuditedFinS #Colombia	−7.220	−2.399	
	(0.553)	(0.820)	
AuditedFinS #Mexico	−4.836	−3.648	
	(0.639)	(0.714)	
Sales	−0.273*	−0.050	−0.314
	(0.076)	(0.693)	(0.314)
MV Fixed assets		0.254	
		(0.507)	
Firm age	0.179*	0.038	−0.306
	(0.055)	(0.486)	(0.145)
Ownership concentration	−0.029	0.023	
	(0.639)	(0.523)	
Employees	0.011**		−0.022*
	(0.022)		(0.096)
Domestic Sales		0.099*	
		(0.071)	
Legal form	−2.892	2.155	
	(0.482)	(0.358)	
Region	−4.420	−1.496	
	(0.215)	(0.530)	
Constant	12.107	−11.290	5.391
	(0.129)	(0.261)	(0.659)
Prob > F	0.000	0.000	0.04
Endogeneity test p-value	0.357	0.247	0.005

Notes: Columns 2 and 3 show the OLS estimates, because in the previous step of regression by instrumental variables, the null hypothesis of exogeneity (last row of the table) is not rejected. Column 4 shows the results of the regression by instrumental variables, where interaction terms cannot be included. In this case, the country effect is controlled by including this variable as an instrumental variable. Brazil, Colombia, and Mexico are dummy variables for each country. P-values are shown between parentheses. *, ** and *** indicate significant variables at the level of 10 %, 5 %, and 1 %, respectively.

There are no significant differences in the percentage of companies with an active line of credit for firms with non-audited FS (61.60 %) compared to audited companies (62.82 %) (Table 5, columns 1 and 2). The country with the lowest proportion of active credit line in audited companies is Argentina.

We found significant differences when analyzing the companies that applied for a credit, as those with unaudited FS represent 55.34 % and those audited, 88.87 %. Brazil presents a noticeably greater presence of this characteristic in audited companies.

There were no significant differences in fixed assets funded by financial institutions between those with FS that are unaudited (35.07 %) and audited (43.64 %). The highest percentages are observed for audited companies in Brazil and Colombia.

The percentage of working capital funded by financial institutions has similar values between companies with unaudited FS (25.71 %) and audited companies (24.05 %). Brazil has the highest percentage for this variable. The same situation arises when analyzing the financing of working capital with suppliers; companies with non-audited FS represent 22.22 % and those audited, 26.09 %. In this case, Argentina has the lowest percentage.

The percentage of companies that invested in fixed assets is not significantly different for those with unaudited FS (66.00 %) than for audited companies (67.49 %). The country with the lowest level of fixed assets in audited companies is Argentina.

These results show different patterns of financing in audited firms among countries, where Argentina has the lowest values for all variables, while Brazil shows the highest values except for working capital financed by suppliers.

4.2. Multivariate analysis

Table 6 presents the results of the probit regressions for the binary outcome variables, since in all cases it is found that the AuditedFinS variable can be treated as exogenous. We estimated several specifications in order to test the robustness of the results.

The FS subject to voluntary audits have a significant positive effect on whether there is an active loan, on applying for a loan, and on investing in fixed assets. AuditedFinS have a positive effect on the probability of having active credit (Table 6, column 1). Although a statistically weak result (significance at 10 % level), it is in line with H1 and with the results of previous studies in developed countries (Kim et al., 2011; Minnis, 2011; Van Caneghem & Van Campenhout, 2012). Regarding control variables, the number of employees has a positive effect on the probability of having an active credit, while the market value of fixed assets shows a negative sign.

AuditedFinS have a positive impact on the probability of having applied for a credit (Table 6, column 2), which, although being a statistically weak result (significance at 5% level), it is also in line with H1. Firm age, the number of employees, and the perception of informal sector competition as an obstacle are factors that also have a positive effect on this outcome variable. In contrast, belonging to a sector with low competition has a negative effect. It is interesting to note the existence of a general positive effect of AuditedFinS on the use of funds from financial institutions, despite the expected lower relevance of financial information in the analyzed countries (Ali & Hwang, 2000; Ball et al., 2000).

Audited FS have a statistically strong positive effect on the probability of having invested in fixed assets (Table 6, column 3), even after controlling for having requested a loan, a variable that also has a significant effect. This evidence supports H3 and extends the results from previous studies that focused on measures of financial information quality applicable only for audited companies, such as Big 4 auditing firms and audit tenure (Chen et al., 2011; Lai, 2009; McNichols & Stubben, 2008; among others). Firm age has a negative effect, while the number of employees and the value of fixed assets both show a positive impact on the probability of having invested in fixed assets.

Table 7 presents the results of the regressions for the quantitative outcome variables. The AuditedFinS variable is statistically not endogenous to study the percentage of fixed assets and working capital funded by financial institutions. On the other hand, AuditedFinS is a statistically endogenous regressor when analyzing the percentage of working capital financed with suppliers[10] . We estimate different specifications of the models, including the different control variables described in Table 4. All variables not shown in Table 7 were not significant in the different specifications.

The estimates in Table 7 indicate that having audited FS is relevant for the financing of working capital with suppliers (see column 3). This is an interesting result, especially when considering the negative effect of firm age and size (measured as employees) on the use of commercial credit as a source of financing. This may indicate the usefulness of this source of funds for younger and smaller firms, which face greater information asymmetries in the traditional financial system. The positive effect of the audited FS indicates the relevance of this informative signal in a context of high opacity, as proposed in H2.

With regard to the use of financial institutions to finance fixed assets (Table 7, column 1), there is a positive effect from firm age and number of employees, while annual sales affects it negatively. It should be clarified that when excluding the Brazilian companies from the regression, the variable AuditedFinS becomes significant with a positive sign. The effects of interaction terms between country and audited FS are not significant.

We observe significant differences in the patterns of multivariate analysis results for the dependent variables among the studied countries. Compared to Argentina, companies in Brazil have a greater proportion of companies with active credit and firms that applied for credit (Table 6, columns 1 and 2). In the same way, Brazilian and Colombian companies have a higher proportion of fixed assets and working capital funded by financial institutions (Table 7, columns 1 and 2). With respect to the probability of investing in fixed assets (Table 6, column 3), both Colombia and Mexico are less likely to make such investments compared to Argentina.

5. Conclusions

The objective of this paper is to study the effects of the voluntary external audit of FS in the investment and financing decisions of SMEs in four Latin American countries: Argentina, Brazil, Colombia, and Mexico. We analyze companies subject to the voluntary auditing regime in their respective countries and consider whether the contracting of an audit is a positive information signal for the external users of FS. To isolate the effect of audited FS, we include as control variables different characteristics that measure investment decisions and financing of companies. Likewise, we use econometric estimation methods to identify and address the problem of the endogeneity of the decision to perform an audit on a voluntary basis.

The results provide favorable evidence that for companies exempt from mandatory auditing, audited FS positively affect access to financing (having an active credit line and having applied for a credit) and in the probability of investing in fixed assets (controlled by financing). Likewise, hiring voluntary audits increases the percentage of working capital financed with suppliers. For the rest of the variables, a voluntary external audit is not significant.

The results show that audited FS provide better access to financing through financial institutions and in trade credit, the latter being particularly important to smaller companies. It should be also mentioned that the negative effect observed for variables such as age and size (measured as number of employees) in the use of commercial credit financing could confirm the usefulness of this source of funds for young and smaller companies, which face greater information asymmetries in the traditional financial system.

[10] In this case, we use the country variable as the regressor of the first stage, and since it generates collinearity with the regression of the second stage, it is excluded from the estimates. When estimating this model by OLS including the country variable, it is not significant.

The results regarding the relevance of an external audit as a measure of financial information quality extend the findings from previous studies in developed countries to emerging economies, where information asymmetries and the use of creative accounting are higher. Moreover, to the best of our knowledge, this paper is the first to document the relevance of the external audit for internal users in private firms through its impact on fixed asset investments. Overall, the results contribute to an active policy debate on two aspects: 1) the relevance of the parameters of the voluntary audit regime for SMEs, and 2) the effectiveness of audit quality review systems. Finally, we suggest that a more in-depth analysis of the usefulness of audit reports for external users, their perceptions, and limitations, as a future line of research through the application of qualitative research methods.

Conflict of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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