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Is the relationship between CSR activities and financial performance of organizations a short term result? An answer with a panel data analysis

¿Es la relación entre las actividades de responsabilidad social corporativa y el desempeño financiero de las organizaciones un resultado de corto plazo? Respuesta con un análisis de datos de panel

Juan José García Santos*, Osmar Hazael Zavaleta Vázquez

Instituto Tecnológico y de Estudios Superiores de Monterrey, México

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Abstract

For many years, research on the profitability of activities related to Corporate Social Responsibility (CSR) has been conducted, where different results have been obtained. However, few is known about whether this relationship is maintained over time, especially in developing economies.

The purpose of this paper is to evaluate if there is a relationship between CSR activities and the financial performance of organizations, and if this relationship is maintained over time. In order to accomplish this goal, different statistical models were employed to add robustness to the results Some of the statistical models employed were univariate tests and panel data models.

Our results indicate that there is a positive relationship between CSR activities and the financial performance of the company. Due to the time restriction, it is not possible to suggest that this relationship is maintained in the long term, but only in the short and medium terms. These results could provide strong evidence that could foster managers of Mexican companies to initiate or increase CSR activities.

JEL code: Q01, L25, G30
Keywords: Corporate social responsibility; Financial performance; Panel data models; Mexico

* Corresponding author.
E-mail address: juanjgarcia@tec.mx (J.J. García Santos).
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Resumen

Durante muchos años se ha realizado investigación sobre la rentabilidad de las actividades relacionadas con la Responsabilidad Social Corporativa, con resultados diferentes. Sin embargo, poco se sabe sobre si esta relación se conserva después de tiempo, sobre todo en las economías en desarrollo.
El fin de este trabajo es evaluar si hay una relación entre las actividades de RSC y el desempeño financiero de las organizaciones, y si esta relación se conserva con el tiempo. Para lograr este objetivo, se emplearon diferentes modelos estadísticos para añadir solidez a los resultados. Algunos de los modelos estadísticos usados fueron pruebas univariantes y modelos de datos de panel.
Nuestros resultados indican que hay una relación positiva entre actividades de RSC y el desempeño financiero de la compañía. Por las limitaciones en tiempo, no es posible sugerir que esta relación se mantiene en el largo plazo, sino sólo a corto y mediano plazos. Estos resultados podrían brindar fuerte evidencia que pudiera alentar a los administradores de compañías mexicanas a iniciar o incrementar las actividades de RSC.

Código JEL: Q01, L25, G30
Palabras clave: Responsabilidad social corporativa; Desempeño financiero; Modelos de datos de panel; México

Introduction

Managers have new challenges to overcome, not only they do deal with the pressure to meet the goal of maximizing the wealth of their shareholders, but they also have to meet social demands (Grow, Hamm and Lee, 2005). Since the 60´s decade, some pension funds screen securities given the ethical or social responsibility values of the issuing firm.

The CSR understands that organizations are aware that they must meet the expectations of society (Gössling and Vocht, 2007). Changes in customer's expectations, new regulations, and climate change have become factors that shape the design of strategies implemented by managers (Prahalad and Hamel, 1994). An increasing number of investors value how companies fulfill their social responsibilities and not just the financial performance of the companies' portfolio (Barnett and Salomon, 2006).

The relationship between CSR activities and financial performance is a well-studied topic that has shown mixed results.

Those who suggest that the relationship between CSR and financial performance is negative argue that companies, attempting to implement CSR activities, invest resources and efforts in areas that are not relevant to the operation of the firm and, in consequence, have a lower return (Aupperle et al., 1985). Friedman (1970) states that it is difficult to estimate the economic benefits of CSR initiatives given that their costs, which are numerous, could reduce profits and decrease shareholder wealth.

Those who suggest a positive relationship between financial performance and CSR activities establish that there is a high correlation between administrative practices and the CSR initiatives, leading to a better performance in the firm. For instance, maintaining a close relationship with the community can generate incentives for the government to provide tax incentives or decreases in regulations (Waddock and Graves, 1997).

Those who suggest that there is no positive nor negative relationship between CSR and financial performance argue that there is a large number of variables involved in financial performance, making it difficult to find the relationship between CSR and financial performance (Ullman, 1985; McWilliams and Siegel, 2000).

There are numerous papers where no difference has been found between the financial performance of companies that are responsible and ethical, and those that are not. In most of these papers, the authors have employed the share returns to measure the financial performance of the companies. Due to this, it was decided to use four fundamental ratios (share return, return on assets, return on equity and price – book ratio) to evaluate financial performance, in order to add robustness to this work.

Bauer, Koedijk and Otten (2005) didn't find evidence of significant differences in risk-adjusted returns between ethical and conventional funds for the 1990–2001 period. Statman (2000) compared the Domini Social Index, an index of socially responsible stocks, and the S&P 500 Index, and didn't find significant differences in risk-adjusted returns. Schroder (2007) found that the SRI stock indices do not exhibit a different level of risk-adjusted returns compared with conventional benchmarks. Scholtens (2005) found the same results for Dutch Socially Responsible Investment Funds.

The main contribution of this paper is not only to identify if there is a relationship between CSR activities in Mexican firms and their financial performance, but also to determine if this relationship is maintained over time, using panel data econometric models.

The remaining of this paper is distributed as follows: Theoretical Framework, Empirical Analysis, Discussion of Results and Conclusions.

Theoretical framework

Literature review

The concept of CSR has a long tradition in the social sciences (Garriga and Melé, 2004). For decades, academics have conducted research to explain the relationship between investment in CSR activities and financial performance, getting different results.

Some researchers have obtained negative results (Vance, 1975; Shane and Spicer, 1984; Wright and Ferris, 1997; Klassen and Whybark, 1999), others have obtained inconclusive results (Alexander and Bucholz, 1982; Aupperle, 1991; Patten, 1991; Ullman, 1985; McWilliams and Siegel, 2000; Hillman and Keim, 2001), and others have obtained positive results (Wokutch and Spencer, 1987; McGuire, Schneeweiss and Sundgren, 1990; McGuire et al., 1988; Aupperle et al., 1985; Cochran and Wood, 1984).

Luetkenhorst (2004) argues that the long-term benefits for companies adopting CSR strategies can, indeed, be significant and involve the following key benefits: a) cost savings, resulting from environmental process improvements within an eco-efficiency perspective; b) enhanced staff loyalty, because companies with advanced human resource development programs enjoy higher levels of loyalty; lower levels of absenteeism; and find it easier to recruit, develop, and retain staff; c) improved government relations, because engaging in CSR makes companies more sensitive to their operating environment and often results in enhanced capacities for risk management, anticipation of challenges and, ultimately, the introduction of viable process, product improvements and better relations with the government; d) enhanced reputation, because the high-value retail brand of a company, due to CSR activities, can be translated in a positive image, effects that could be a decisive factor for future market development; and e) consumer response. Consumer perceptions about the nature and quality of the firm´s products and its concern and care for the environment have increasingly been important factors to foster the competitive advantage against competitors (Prahalad and Hamel, 1994; Klein and Dawar, 2004; Reinhardt, 1998). By investing in CSR activities: a) relationships with the stakeholders are improved (Jones, 1995; Wicks, Berman, and Jones, 1999); b) quality employees are attracted and maintained, reducing costs and improving efficiency in operation (Hart and Ahuja, 1996; Greening and Turban, 2000); and c) market opportunities and the possibility of maintaining market power are increased, improving the financial performance of companies (Fombrun, Gardberg, and Barnett, 2000).

One of the most important challenges in this type of work is to specify the appropriate model. The process in which CSR permeates in the operation and performance of the company is complex, and due to this complexity, it is possible to omit relevant variables to explain the profitability of the company. On the other hand, if the model is not correctly specified, it is virtually impossible to isolate the impact of CSR activities on financial performance (McWilliams and Siegel,

2000). There is no consensus on what elements should be included in the social responsibility of organizations (Frederick, 1994; Griffin, 2000).

CSR in Mexico

Gomez (2003) argues that there is a lack of definition of the CSR concept in Mexico, given that some companies associate the concept with charitable activities. Some other authors relate it to a conceptual framework to ensure better working conditions. The CSR concept is also related to those efforts to improve the community where the companies are established; it is also seen as a strategy designed to generate "win-win" relationships between shareholders and stakeholders.

Mexican companies are not left behind in this global trend of implementing CSR activities. There are different agencies that foster CSR initiatives, being the Mexican Center for Philanthropy (CEMEFI), a non-governmental entity, one of the most important in Mexico. The certification of companies is one of the main activities of CEMEFI. Analyzing the number of companies that achieve this accreditation for the first time, we can see an increase, since 2008, in the interest of companies to distinguish themselves as socially responsible. CEMEFI became one of the leaders in promoting, advising, and evaluating the activities of CSR in Mexico.

Figure 1. Certified Companies by CEMEFI (2008 – 2016)
Source: CEMEFI

CEMEFI defines CSR as follows:

"[...] The conscious and consistent commitment to fully comply with the purpose of the Company, both internally and externally, considering the economic, social, and environmental expectations of all its participants, showing respect for people, ethical values, community, and the environment, thus, contributing to the construction of the common good".

Another important recognition for companies that develop CSR activities is to belong to the Prices and Quotes Sustainability Index (IPCS). Since its implementation in 2012, the IPCS was designed to measure the performance of leading companies in Mexico that have adopted policies on economic, environmental and social issues.

Each company will be evaluated by the Center of Excellence in Corporate Governance (CEGC), who will assign a sustainability rating according to the average achieved, and based on the following factors: (1) Environmental Commitment; (2) Social Responsibility; and (3) Corporate Governance.

The CEGC evaluates each company based on reliable public information and assigns ratings according to the previously established criteria. The information is integrated and, on the basis of the information available for the evaluated period, each issuer is informed of the evaluation's result. On one hand, this is a way of commitment that calls to the action on the part of the evaluator; on the other hand, the performance of the evaluated company is compared against: (a) its own

rating in the previous year (whenever it applies) and (b) the national average in each of the three factors mentioned above. In this way, the evaluated companies will be able to define strategies and objectives to foster their CSR projects and initiatives.

The updating of the companies that belong to the IPCS is made annually, being the last business day of January at the close of the market the effective date.

The first studies involving the IPCS were made by De la Torre, Galeana, and Aguilasocho (2016). They studied the mean–variance efficiency of the sustainable investment practice in Mexico by proving the existence of a statistical equality in the performance levels of the IPCS against the broader market index, IPCcomp.

De la Torre and Enciso (2017) also contributed to this line of research. Using a non-parametric multivariate equality test, along with a multi-factor market cap model, and a Monte Carlo simulation, they found that the IPCS, the IPCcomp, and the IPC have a statistically equal mean-variance performance.

Under this context, the objective of this work is: a) to determine the relationship of CSR activities and the financial performance of Mexican companies; and b) to verify if this relationship remains over time.

Empirical analysis

Data description

The data of this work was retrieved from different information sources: a) the National Institute of Statistic and Geography (INEGI); b) the Central Bank of Mexico (Banxico); and c) the Bloomberg database.

The sample is represented by the Mexican public companies listed on the Mexican Stock Exchange (Bolsa Mexicana de Valores), BMV, during the period from 2012, the year in which IPCS was implemented, to 2016, on a quarterly basis. The variables that were employed in this work are described below:

Financial performance

All the variables related to the financial performance of each company were retrieved from the Bloomberg database. The financial performance of each firm was measured through four indicators of profitability: (1) return of the stock price; (2) return on assets (ROA); (3) return on equity (ROE); and (4) the price to book ratio. Using these four variables, we present a variety of metrics commonly used among financial analysts to evaluate a companies' financial performance.

The percentage change in share price was calculated considering the adjusted closing price for each of the shares during the first business days of March, June, September and December. It was decided to consider the adjusted closing price to avoid valuation errors due to share splits. In the models employed, it is defined as Share. The return on assets is defined as the ratio between the net income and the value of the assets of the company in a given period. In the models employed, it is defined as the ROA. The return on capital is defined as the ratio between the net income and the value of the capital of the company in a given period. In the models employed, it is defined as ROE. The price to book ratio is defined as the ratio between the share price and the book value per share in a given period. In the models employed, it is defined as PB ratio.

Corporate Social Responsibility

Measuring CSR activities is a challenge because it involves the interaction of different areas of the company; therefore, it is extremely difficult to identify the variables that must be included in the model (Margolis and Walsh, 2007).

Considering the difficulty of measuring the concept of CSR, the IPCS was used as a measure of CSR activities of companies listed in the BMV. The advantage of using the IPCS instead of the CEMEFI accreditation is to have a source with public information and the possibility of knowing the methodology used for the certification of companies that are considered socially responsible.

The CSR activities were represented as a dummy variable, taking the value of one, when the issuer was part of the IPCS, and zero otherwise. In the econometric models it is named as Sustainability.

Control variables

The poor specification of the model has severe effects on the results of estimated models. Alonso-Almeida´s, et al. (2012) work failed because they considered only two variables of control in their model, size and debt. Easton, and Sommers (2018) argues that it is important to recognize that there are other economic variables that affect the financial performance of any company.

In a globalized world, it is common for companies to have operations with companies from another country, so the exchange rate is a variable that significantly affects the financial performance of the company, as established by the work done by Kavussanos, Marcoulis and Arkoulis (2002), Tsoukalas (2003), Patra and Poshakwale (2016), Ratanapakorn and Sharma (2007), Rjoub, Türsoy and Günsel (2009), Haque and Sarwar (2012), Khoury (2015) and Demir, Alıcı and Chi Keung Lau (2017), who decided to incorporate the exchange rate as an independent variable to explain the financial performance measured through the share return, and the work done by of Sayedi (2014) and Ogunbiyi and Ihejirika (2014) to explain the measured financial performance through the ROE and ROA.

GDP is a variable that affects current consumption and is an element that is considered in investment decisions; therefore, it also affects the financial performance of companies. The work done by Kavussanos, Marcoulis and Arkoulis (2002), Haque and Sarwar (2012), Khoury (2015) and Yang, Kim and Ryu (2018) consider the GDP to explain the financial performance measured through the performance of the share return, and the work done by Gul, Irshad, and Zaman (2011), Anbar and Alper (2011), Hassan and Bashir (2003), Rachdi (2013), Căpraru and Ihnatov (2014), Saeed (2014) to explain the performance measured by the ROE and ROA.

Market return serves as a global indicator of the economy and affects the valuation of stock market instruments; therefore, it also affects financial performance. The works done by Ratanapakorn and Sharma (2007), Khoury (2015) and Demir, Alıcı and Chi Keung Lau (2017) consider the variable of market performance to explain the financial performance measured through the share return, and the work done by Azzam, (2010) to explain the financial performance measured through the ROE and ROA.

The firm´s size information was compiled from the Bloomberg database and represents the market capitalization of the company in the corresponding period. The greater the firm´s size, the greater the resources available to invest in different projects in order to achieve greater profits. This variable is named as MarketCap and its unit of measurement is millions of dollars.

The information on the level of leverage or debt of the company was compiled from the Bloomberg database and is computed as the ratio of total debt to the value of assets of the company in the corresponding period. High levels of debt generate an increase in the interest rate on loans requested, increasing the payment of interest and decreasing the possible benefits in the operation of the firm. This variable is named as Debt in the models employed.

The economic growth information was compiled from INEGI and represents the percentage change in quarterly Gross Domestic Product (GDP). Economic growth generates a higher income in the population so individuals would have greater income available to save or to purchase goods and services, improving the financial performance of companies. This variable is named as EcoGrowth in the models employed.

The market return was compiled from the Bloomberg database and represents the percentage change in the IPC in each of the quarters. Being an index that represents the general behavior of the BMV through its different components, an increase of the market performance would be associated with an increase in the financial performance of the companies. This variable is named as MReturn in the models employed. The exchange rate was obtained from Banxico and represents the amount of MXN to pay per one USD. The exchange rate may affect the financial performance of the company in different ways, increasing foreign financing and the cost of imports, and decreasing the cost of exports. This variable is defined as Exchange in the models employed.

Data analysis

Descriptive statistics of financial performance

As mentioned above, four variables were used to measure the financial performance of the company. For space reasons, only the descriptive statistics for the dependent variable of our model are presented. The descriptive statistics of financial performance variables are shown in the following tables.

Table 1
Descriptive statistics for Share

		Obs	Mean	Std. Dev.	Min	Max
2012 - 2016	No CSR	690	0.0275	0.1840	-0.6069	2.2040
	CSR	500	0.0255	0.1430	-0.4065	1.0049
2012	No CSR	127	0.0666	0.2141	-0.5977	1.5050
	CSR	96	0.0775	0.1350	-0.3814	0.4380
2013	No CSR	135	0.0211	0.1686	-0.6069	0.6416
	CSR	96	0.0098	0.1376	-0.4062	0.4235
2014	No CSR	131	0.0506	0.2512	-0.2359	2.2040
	CSR	112	0.0002	0.1163	-0.2834	0.4893
2015	No CSR	154	-0.0037	0.1318	-0.3609	0.3648
	CSR	103	0.0188	0.1611	-0.4065	0.6242
2016	No CSR	143	0.0112	0.1304	-0.5261	0.5155
	CSR	93	0.0258	0.1537	-0.2606	1.0049

Source: Author´s own

Table 2
Descriptive statistics for ROA

		Obs	Mean	Std. Dev.	Min	Max
2012 - 2016	No CSR	690	3.7490	5.5858	-18.6454	29.5629
	CSR	500	5.0447	5.2722	-13.3033	22.3918
2012	No CSR	127	4.6064	5.3174	-11.1432	18.2412
	CSR	96	6.0789	5.1948	-12.3357	17.4611
2013	No CSR	135	3.6303	4.5177	-6.4385	17.0697
	CSR	96	5.8692	4.6744	-9.3951	16.0886
2014	No CSR	131	3.4192	4.7959	-8.4653	19.1913
	CSR	112	4.5755	4.4434	-9.3893	14.5475
2015	No CSR	154	3.5491	6.2079	-12.7284	25.0614
	CSR	103	3.9274	5.7010	-9.8478	22.3918
2016	No CSR	143	3.6167	6.6051	-18.6454	29.5629
	CSR	93	4.9285	6.0808	-13.3033	21.4773

Source: Author´s own

Table 3
Descriptive statistics for ROE

		Obs	Mean	Std. Dev.	Min	Max
2012 - 2016	No CSR	690	5.3175	29.6718	-422.6590	70.3865
	CSR	500	12.8101	17.2486	-106.3560	101.7870
2012	No CSR	127	8.5971	21.9907	-170.7280	70.3865
	CSR	96	14.8586	14.3831	-40.3499	62.3033
2013	No CSR	135	6.4749	16.9189	-151.2840	35.2864
	CSR	96	15.3674	14.6971	-29.2937	77.0061
2014	No CSR	131	4.7105	27.2245	-220.8150	39.2276
	CSR	112	11.4366	13.7185	-28.9964	82.6002
2015	No CSR	154	4.6820	28.7380	-217.2930	50.9351
	CSR	103	9.8900	18.1276	-38.1750	65.9181
2016	No CSR	143	2.5528	44.5522	-422.6590	36.4593
	CSR	93	12.9437	23.7184	-106.3560	101.7870

Source: Author´s own

Table 4
Descriptive statistics for PB ratio

		Obs	Mean	Std. Dev.	Min	Max
2012 - 2016	No CSR	690	2.2877	2.4409	0.1795	23.8894
	CSR	500	3.7857	4.1317	0.3130	42.4698
2012	No CSR	127	2.1223	2.1005	0.1795	11.6758
	CSR	96	3.3005	2.5017	0.4202	15.3258
2013	No CSR	135	2.1601	1.9584	0.2062	11.4842
	CSR	96	3.7794	3.3355	0.8707	24.1497
2014	No CSR	131	2.6486	2.9451	0.4339	20.0558
	CSR	112	3.2181	3.1295	0.6839	21.2381
2015	No CSR	154	2.3198	2.8295	0.3938	23.8894
	CSR	103	3.8739	3.7051	0.3130	19.9689
2016	No CSR	143	2.1898	2.1534	0.3507	16.2918
	CSR	93	4.8790	6.7638	0.7941	42.4698

Source: Author´s own

Wallis test, first approach

In order to test our hypothesis "There is a relationship between CSR activities and the financial performance of the companies and if this relationship remains over time", we employed three different tests. The first one is the test of Kruskal-Wallis.

The Kruskal – Wallis is the statistical technique that allows performing the test on the equality of the population means between variables that are affected by different treatments. The test was performed for each of the financial performance variables, being the distinction between the companies, whether they belong to the IPCS or not.

The null hypothesis for this test is that the population means are equal, while the alternative hypothesis is that they are different:

$$H_o: \mu_{Sustainability} = \mu_{No\ Sustainability}\ VS\ H_a: Population\ means\ are\ different. \quad (1)$$

Table 5
Kruskal – Wallis tests for financial performance

Period	*Share*	*ROA*	*ROE*	*PB ratio*
2012	0.1296	0.0109	0.0001	0.0001
2013	0.5786	0.0001	0.0001	0.0001
2014	0.2908	0.0108	0.0147	0.0002
2015	0.2537	0.3231	0.0571	0.0001
2016	0.5472	0.1332	0.016	0.0001
2012-2016	0.4359	0.0001	0.0001	0.0001

Source: Author´s own

Analyzing the values in the table, which represent the p-values of the Kruskal – Wallis test, we can see in the second column that all values are above 0.10, the significance level, which means that there is no difference in the share returns between the companies that perform CSR activities and those that do not. In terms of the ROA, the evidence suggests that there is a difference in financial performance among companies that perform CSR activities and those that do not. Only in two periods, 2015 and 2016, the p-values suggest that there is no a statistical difference in the ROA between companies that perform CSR activities and those that do not.

In the case of ROE and PB ratio, there is strong evidence to suggest that there is a difference in financial performance among companies that perform CSR activities. The p-values of all the periods we observe are lower than 0.10, the significance level, allowing us to conclude that there is a clear difference between these types of companies and that this relationship is maintained over time.

Break point test, second approach

Since its creation in 2012, there are companies that have remained as part of the IPCS during the first five years of life. These companies are considered study objects to analyze whether integration to the IPCS has led to an improvement in financial performance due to the implementation of CSR activities. Inclusion in the IPCS does not mean that companies are just beginning in CSR activities, but it represents recognition by an academic institution with expertise in the area, and a distinction among all other companies by having a greater attachment to the guidelines that mark the CSR activities.

To test this condition, we will use the Chow test, which is employed to test if there is a structural break in time series data, i.e., if the estimated coefficients, in different periods of time, are equal.

The models that were considered to perform the break point test are the following:

$$\text{Performance}_{it} = \beta_0 + \beta_1 \text{MarketCap}_{it} + \beta_2 \text{Debt}_{it} + \beta_3 \text{EcoGrowth}_{it} + \beta_4 \text{MReturn}_{it} + e_{it} \quad (2)$$

where financial performance is measured by Share, ROA, ROE and PB ratio.

In order to analyze whether the integration towards the IPCS has changed the way in which the control variables explain the financial performance of the company, 15 companies that have been part of the IPCS, during the life of the index, will be analyzed. The study period comprises 10 years in total, five years before the implementation of the index and five years after. If there is a break point in 2012, we could conclude that CSR activities do affect the financial performance of the company.

The F-statistic and p-value of Chow tests for Share, ROA, ROE and PB ratio models are shown in Table 14, using the first quarter of 2012 as a breaking point. In the case of the Share model, it is observed that only for 3 companies, ALSEA, Axtel and Industrias Peñoles, it is accepted that there is a break point in 2012. For ROA, the number of companies in which structural break is accepted increases to 11 companies, representing 73 percent of the sample. In ROE there are 9 companies, which represent 60 percent of the sample, where it is accepted that there is a break point. Finally, in PB ratio there are 10 companies, 67 percent of the sample, where it is accepted that there is a break point in 2012.

Table 6
Structural break test

	Share		*ROA*		*ROE*		*PB ratio*	
Company	F - statistic	p - value	F - statistic	p - value	F - statistic	p - value	F – statistic	p – value
ALFA	1.0892	0.3938	4.4934	0.0028	5.2125	0.0011	3.4885	0.0110
ALSEA	2.0145	0.0985	3.3880	0.0127	3.1871	0.0170	6.9659	0.0001
AMÉRICA MÓVIL	1.1830	0.3447	1.5669	0.1951	0.4971	0.8048	5.0247	0.0014
GRUPO AEROPORTUARIO DEL SURESTE	1.3622	0.2653	6.8891	0.0002	6.9633	0.0001	8.4184	0.0000
AXTEL	3.4868	0.0134	1.1980	0.3425	1.3426	0.2791	1.5253	0.2144
BIMBO	0.4629	0.8295	10.8121	0.0000	5.3089	0.0010	2.9569	0.0238
CEMEX	0.4570	0.8336	2.3472	0.0592	2.5689	0.0424	2.7492	0.0323
FEMSA	1.0376	0.4232	3.7401	0.0078	3.9464	0.0058	0.7845	0.5896
GRUPO FINANCIERO BANORTE	1.4621	0.2369	18.3274	0.0000	3.9452	0.0079	1.3602	0.2739
HERDEZ	1.1005	0.3876	1.0357	0.4243	1.0273	0.4292	1.6393	0.1748
KIMBERLY - CLARK DE MÉXICO	0.2428	0.9574	1.7412	0.1564	1.4691	0.2326	1.8346	0.1364
COCA-COLA FEMSA	1.0519	0.4148	2.0459	0.0939	1.5043	0.2145	2.7245	0.0336
INDUSTRIAS PEÑOLES	3.3210	0.0140	6.0101	0.0004	6.8165	0.0002	4.7222	0.0021
TELEVISA	0.5877	0.7371	7.0486	0.0001	1.9554	0.1078	4.1038	0.0047

WALMART	1.5832	0.1904	3.1401	0.0182	4.1380	0.0045	10.6380	0.0000

Source: Author´s own

The time series are plotted to show how the incorporation in the IPCS fosters an improvement in the performance measured through the different financial variables.

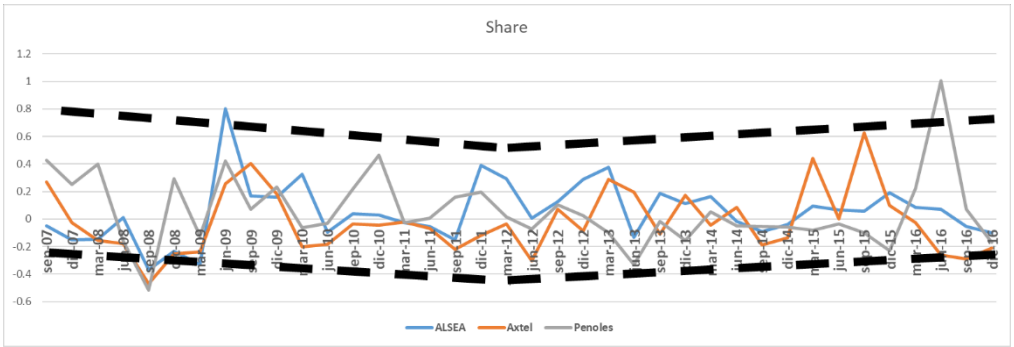

Figure 2.Time series for companies with structural break measured through Share.
Source: Author´s own

For Share, there were only three companies that showed structural change. The time series of these companies can be found in figure 2. In the case of the three companies, a change in the slope can be seen since the first quarter of 2012.

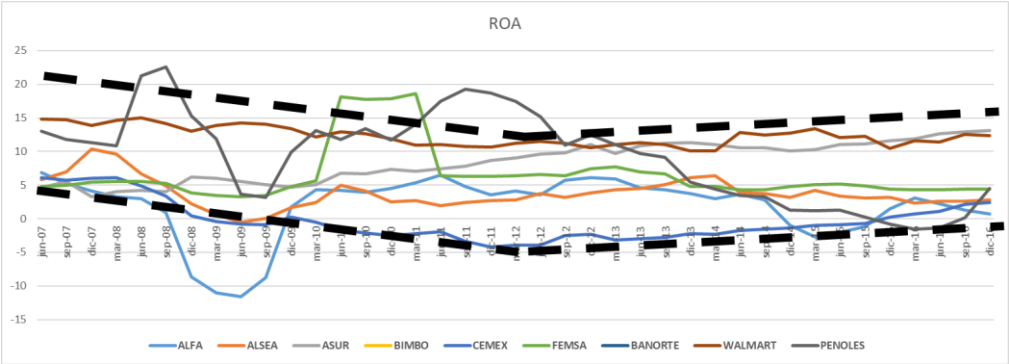

Figure 3. Time series for companies with structural break measured through ROA.
Source: Author´s own

For ROA, there were eight companies that showed structural change. The time series of these cases can be found in figure 3. For all the companies a change in the slope can be seen since the first quarter of 2012.

http://dx.doi.org/10.22201/fca.24488410e.2020.2035

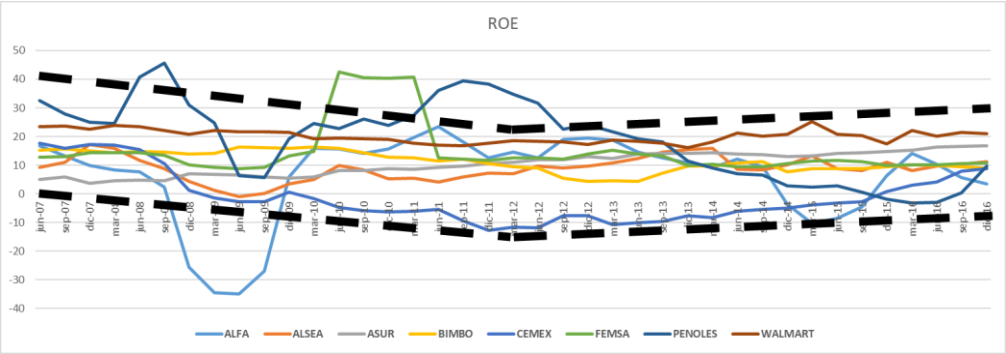

Figure 4. Time series for companies with structural break measured through ROE.
Source: Author´s own

For ROE, there were eight companies that showed structural change. The time series of these cases can be found in figure 4. In the case of all companies, a change in the slope can be seen from the first quarter of 2012.

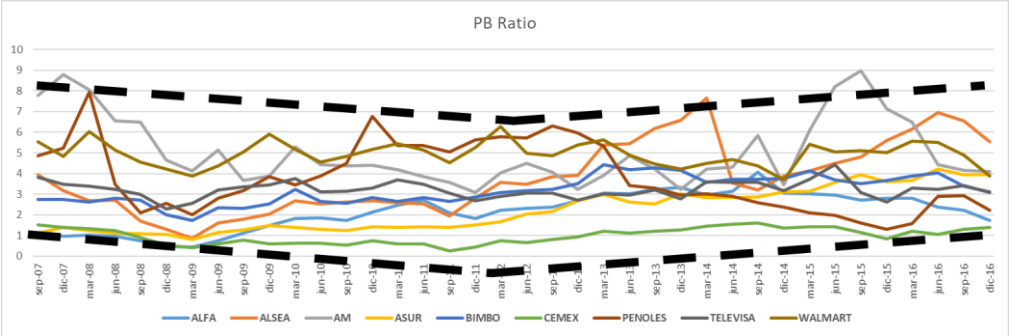

Figure 5.Time series for companies with structural break measured through PB ratio.
Source: Author´s own

For PB ratio, there were nine companies that showed structural change. The time series of these companies can be found in figure 5. In the case of all companies, a change in the slope can be seen from the first quarter of 2012.

At the beginning of 2012, an important event occurred, the implementation of IFRS in Mexico. When coinciding with the date of the structural break test, a hypothesis is that the change in financial performance of the companies analyzed, was derived from a change in accounting standards and not because its incorporation into the IPCS.

In order to test that the change in financial performance is a consequence of the incorporation to the IPCS, it was decided to do the same structural break test for the companies that were never part of the IPCS. If there is a similar change in these companies, the conclusion would be that the cause of the changes in financial performance could be, in part, due to the implementation of IFRS.

Thirteen companies employed in the sample were never part of the IPCS. The results of the structural change tests are shown in Table 7.

Table 7
Structural break test for companies that were never part of the IPCS.

Company	Share		ROA		ROE		PB Ratio	
	Fstatistic	p - value	F statistic	p - value	F statistic	p - value	F statistic	p - value
ARA	0.6136	0.7173	9.2499	0	9.2499	0	5.9027	0.0005
AUTLAN	0.3722	0.8899	0.4472	0.8403	0.5289	0.7812	1.1717	0.3515
CIDMEGA	1.1874	0.3437	1.535	0.2063	2.1255	0.0845	64.2953	0.0000
CIEB	1.3331	0.2783	4.3751	0.0035	2.838	0.0292	0.9874	0.4540
CULTIBA	1.4183	0.2454	6.6147	0.0002	6.697	0.0002	9.173	0.0000
GCC	0.5995	0.728	3.2856	0.0153	3.3412	0.0142	17.0297	0.0000
GFINBURO	0.766	0.6033	2.2883	0.0661	1.7561	0.1478	10.7752	0.0000
GRUMA	0.8677	0.5315	5.2332	0.0012	5.4198	0.001	1.6962	0.1618
ICHB	2.2128	0.074	0.8273	0.5594	0.9251	0.4933	4.5461	0.0028
KUOB	1.7054	0.1596	1.0626	0.4097	1.0294	0.4288	1.9326	0.1131
LIVEPOL	0.7139	0.6417	5.1462	0.0013	4.0256	0.0055	1.4172	0.2458
SAREB	0.2172	0.9679	4.9828	0.0016	4.5616	0.0028	2.5591	0.0441
SIMECB	0.9262	0.4926	1.9689	0.1071	1.7444	0.1504	11.8166	0.0000

Source: Author´s own

Analyzing the results of the tests, we can see that none of the companies show structural break for the case of Share. The companies that showed structural change for the variable ROA are ARA, CIEB CULTIBA, GCC, GFINBURO, GRUMA, LIVEPOL and SAREB. However, only the companies CIEB and GCC showed a positive change in the slope. The rest of the companies showed a negative change in the slope, which implies that these companies didn´t have a better financial performance due to the IFRS implementation. The time series for this financial performance variable are plotted in figure 6 and 7.

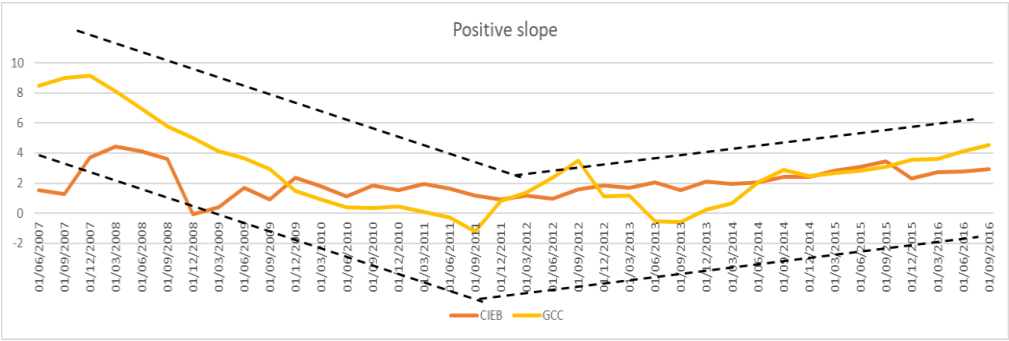

Figure 6. Time series for companies with positive change in the slope.
Source: Author´s own

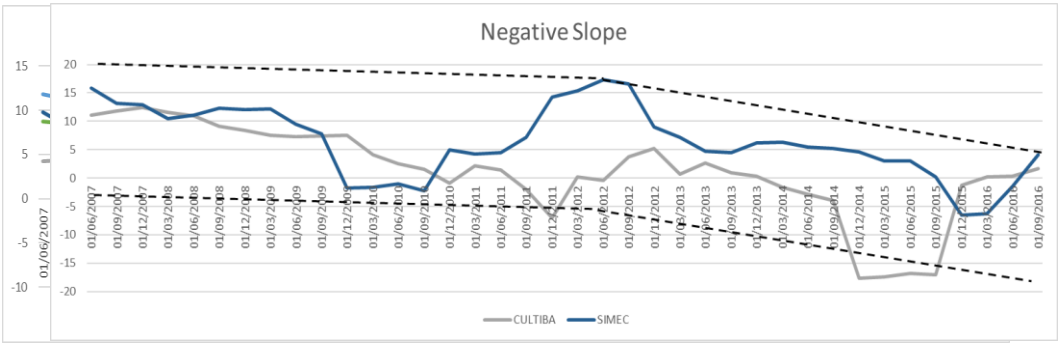

Figure 7. Time series for companies with negative change in the slope.
Source: Author´s own

The companies that showed structural change for the variable ROE are ARA, CIEB, CULTIBA, GCC, GRUMA, LIVEPOL and SAREB. Only the companies CIEB and GCC showed a positive change in the slope. CULTIBA and SIMEC showed a negative change in the slope. It is not clear what change occurred for ARA, GRUMA and LIVEPOL. The time series for this financial performance variable are plotted in Figure 8, 9 and 10.

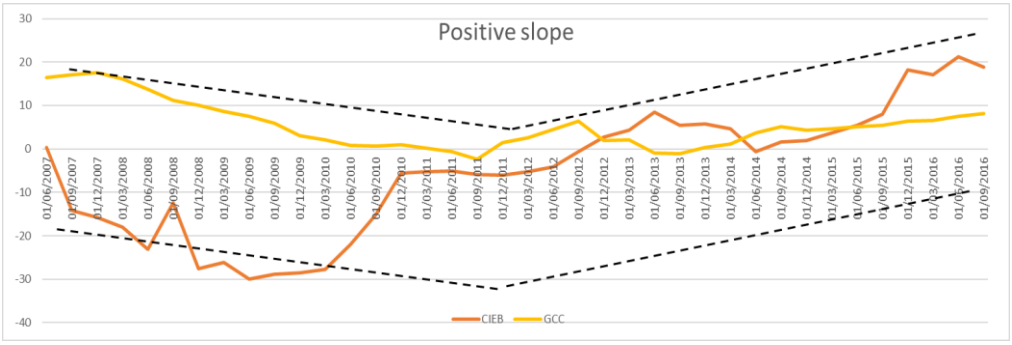

Figure 8. Time series for companies with positive change in the slope.
Source: Author´s own

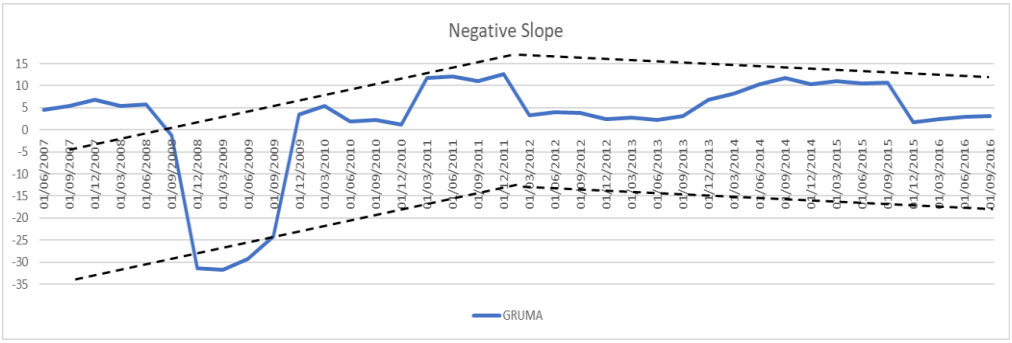

Figure 9. Time series for companies with negative change in the slope.
Source: Author´s own

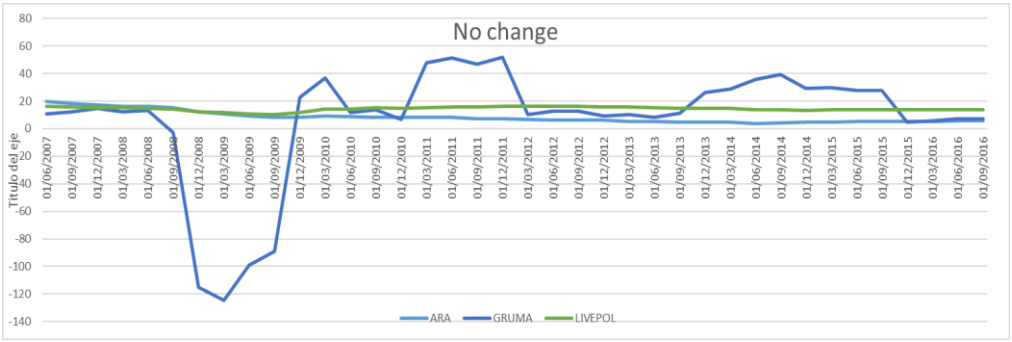

Figure 10. Time series for companies without change in the slope.Source: Author´s own

For the last financial performance variable, PB ratio, the eight companies that showed structural change are ARA, CIDMEGA, CULTIBA, GCC, GFINBURO, ICHB, SIEB and SIMECB. Only the companies ARA, CIDMEGA and SIEB showed a positive change in the slope. CULTIBA, GCC, GFINBURO, ICHB and SIMEC showed a negative change in the slope. The time series for this financial performance variable are plotted in Figure 11 and 12.

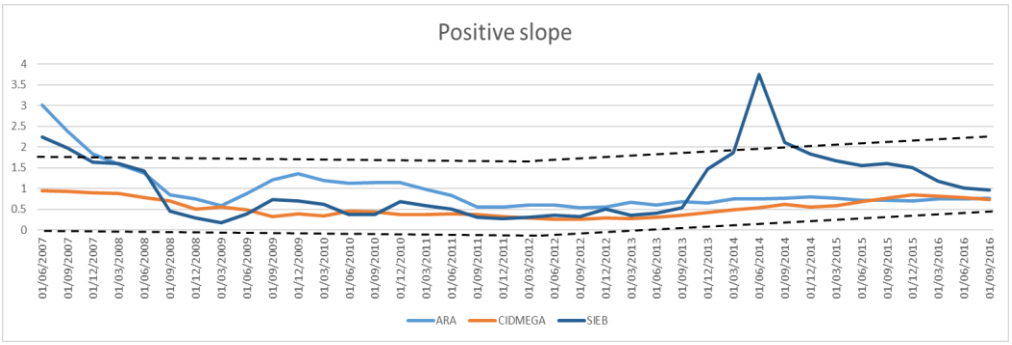

Figure 11. Time series for companies with positive change in the slope.

Source: Author´s own

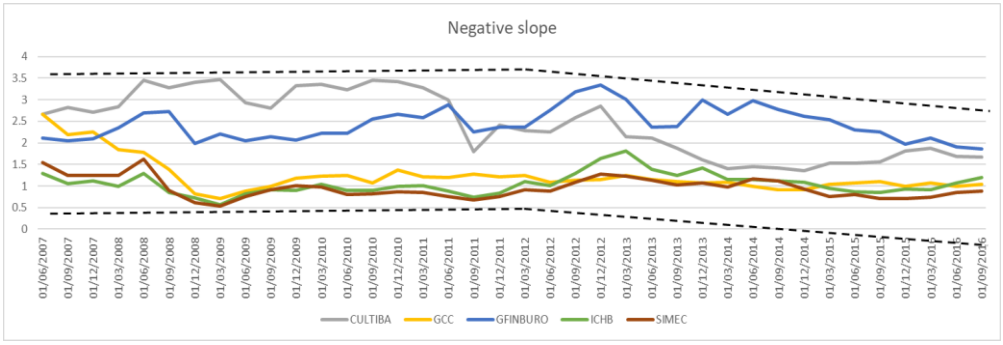

Figure 12. Time series for companies with positive change in the slope.

Source: Author´s own

From a sample of 13 companies, only two of them show a positive change in the slope for ROA, two companies show a positive change in the slope for ROE, and only three companies for PB ratio. These findings are evidence to think that the implementation of IFSR in Mexico is not the cause of an improvement in financial performance.

Considering the results of the structural break test, we can suggest that there is a change in the financial performance between the companies with CSR activities and those that were included in the IPCS. The results obtained using the structural break test are similar to those obtained through the two previous approaches.

Panel data models, third approach

The previous approaches allow us to conclude that CSR activities do affect the financial performance of the company. It was decided to use data panel models to test whether the relationship between CSR activities and financial performance is maintained over time. It was used the estimation technique of generalized least squares (GLS), because it considers the presence of heteroscedasticity among the different companies, a phenomenon that is common when analyzing financial and economic variables.

The following model structure was employed to estimate the parameters:

$$\text{Performance}_{it} = \beta_0 + \beta_1 Sustainability + \beta_2 \text{MarketCap}_{it} + \beta_3 \text{Debt}_{it} + \beta_4 \text{EcoGrowth}_{it} + \beta_5 \text{MReturn}_{it} + \beta_6 \text{Exchange}_{it} + e_{it} \quad (3)$$

where Performance is measured by Share, ROA, ROE, and PB ratio.

Our hypothesis states that there is a relationship between CSR activities and financial performance; therefore, we expect to find positive and statistically significant estimated coefficients for the variable Sustainability over time.

The results of Share models are shown in Table 8 and 9. We can see that there are mixed results in the few years where the estimated coefficient is statistically significant. The coefficient is significant and positive in 2012 and 2015, while it is negative and significant in 2014. Due to this inconsistency, it is not possible to suggest a difference in financial performance measured through share returns. These results are similar to those obtained by Bauer, Koedijk and Otten (2005), Schroder (2007), De la Torre, Galeana and Aguilasocho (2016), and De la Torre and Enciso (2017).

Table 8
Results for Share

	2012		*2013*		*2014*	
Variables	Coefficient	p - value	Coefficient	p - value	Coefficient	p - value
Sustainability	0.0393	0.004	0.0072	0.597	-0.0519	0
Market Cap	0	0.011	0	0.013	0	0.154
Debt	-0.002	0	0.0002	0.367	0.0007	0.009
Economic Growth	0.8574	0.001	-0.9394	0.004	2.1968	0
Market Return	0.8631	0.002	0.6958	0	0.0077	0.972
Exchange Rate	-0.0794	0.022	0.0056	0.872	-0.113	0
Cons	1.0999	0.016	-0.0483	0.913	1.5262	0

Source: Author´s own

Table 9

Results for Share

Financial Performance	2015		2016		2012 2016	
Variables	Coefficient	p - value	Coefficient	p - value	Coefficient	p value
Sustainability	0.0332	0.0150	0.0082	0.4830	0.0073	0.3120
Market Cap	0.0000	0.8360	0.0000	0.3460	0.0000	0.7670
Debt	-0.0015	0.0000	-0.0005	0.0030	-0.0004	0.0230
Economic Growth	-0.5406	0.1400	1.4104	0.1240	-0.0023	0.9830
Market Return	-0.2166	0.2930	1.8154	0.0070	0.5960	0.0000
Exchange Rate	0.0208	0.0550	-0.0117	0.1610	-0.0050	0.0000
Cons	-0.2938	0.0940	0.1928	0.2010	0.0987	0.0000

Source: Author´s own

The size of the company is not a determinant of share return; as could be expected, the share return has a negative relationship with the debt. There is no clear relationship with economic growth due to the fact that mixed results were obtained in the periods in which it is significant. A positive relationship with market return is observed, obtaining positive and significant coefficients in most periods. The exchange rate is not a determinant of the share return because it is significant in only one period.

The results of ROA models are shown in Table 10 and 11. The results are convincing; in all the years, the estimated coefficient representing CSR activities is positive and statistically significant. Based on this, it can be suggested that there is a positive relationship between the activities of CSR and the ROA of the companies, and that this relationship is maintained over time.

Table 10
Results for ROA

	2012		*2013*		*2014*	
Variables	Coefficient	p - value	Coefficient	p - value	Coefficient	p - value
Sustainability	1.2413	0.0000	1.8622	0.0000	1.0462	0.0000
Market Cap	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Debt	-0.1576	0.0000	-0.1181	0.0000	-0.1081	0.0000
Economic Growth	-13.1736	0.0020	-4.7363	0.4260	-11.5187	0.3580
Market Return	-4.6131	0.3040	-4.5615	0.0190	5.8811	0.2980
Exchange Rate	0.4074	0.4600	0.2144	0.7170	0.0313	0.9400
Cons	3.3027	0.6490	3.7798	0.6190	5.2605	0.3500

Source: Author´s own

Table 11
Results for ROA

	2015		*2016*		*2012 - 2016*	
Variables	Coefficient	p - value	Coefficient	p - value	Coefficient	p - value
Sustainability	1.3722	0.0000	1.4588	0.0000	1.0829	0.0000
Market Cap	0.0000	0.0000	0.0000	0.0340	0.0000	0.0000
Debt	-0.1582	0.0000	-0.1816	0.0000	-0.1432	0.0000
Economic Growth	4.9650	0.5560	-4.0408	0.8170	-2.1471	0.2990
Market Return	2.4895	0.5980	-2.6666	0.8340	0.5801	0.6860
Exchange Rate	-0.0266	0.9080	0.0765	0.6350	-0.0565	0.0200
Cons	7.5698	0.0420	7.6625	0.0090	8.0541	0.0000

Source: Author´s own

The size of the company is a positive determinant of ROA; as could be expected, the ROA has a negative relationship with the debt. Economic growth was only significant in one period, so it can´t be considered as a determinant of ROA. A similar situation occurs with market return and exchange rate.

The results of ROE models are shown in Table 12 and 13. In all the years, the estimated coefficient, representing CSR activities, is positive and statistically significant. This relationship is maintained over time.

Table 12

Results for ROE

	2012		*2013*		*2014*	
Variables	Coefficient	p - value	Coefficient	p - value	Coefficient	p - value
Sustainability	3.5923	0.0000	6.2495	0.0000	4.7985	0.0000
Market Cap	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Debt	-0.2347	0.0000	-0.1840	0.0000	-0.3385	0.0000
Economic Growth	-31.0568	0.0180	-1.2996	0.9070	-6.9350	0.6830
Market Return	-10.7867	0.4340	-19.0876	0.0000	25.0328	0.0010
Exchange Rate	0.6793	0.6870	-1.4676	0.1830	-0.5966	0.3670
Cons	6.4673	0.7710	29.8477	0.0350	20.3834	0.0230

Source: Author´s own

Table 13
Results for ROE

	2015		*2016*		*2012 - 2016*	
Variables	Coefficient	p - value	Coefficient	p - value	Coefficient	p - value
Sustainability	5.4372	0.0000	6.8212	0.0000	4.1562	0.0000
Market Cap	0.0000	0.0000	0.0000	0.0010	0.0000	0.0000
Debt	-0.4341	0.0000	-0.5316	0.0000	-0.2845	0.0000
Economic Growth	17.1276	0.3770	9.7088	0.8960	-3.2327	0.5750
Market Return	8.0858	0.4590	33.3378	0.5360	1.1372	0.7690
Exchange Rate	-0.2523	0.6280	0.6264	0.3620	-0.2189	0.0020
Cons	19.3211	0.0220	6.8823	0.5770	16.2228	0.0000

Source: Author´s own

The size of the company is a positive determinant of ROE and a negative relationship with the debt. Economic growth, and the other macroeconomic variables, seem to be unrelated to ROE.

The results of PB ratio models are shown in Table 14 and 15. In all the years, the estimated coefficient representing CSR activities is positive and statistically significant. This relationship is maintained over time.

Table 14
Results for PB ratio

	2012		*2013*		*2014*	
Variables	Coefficient	p - value	Coefficient	p - value	Coefficient	p - value
Sustainability	0.7708	0.0000	0.2456	0.0010	0.2456	0.0010
Market Cap	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Debt	0.0157	0.0000	0.0475	0.0000	0.0475	0.0000
Economic Growth	4.5809	0.0000	-0.5892	0.8400	-0.5892	0.8400
Market Return	0.9727	0.3700	1.1408	0.3910	1.1408	0.3910
Exchange Rate	-0.2116	0.1140	-0.0248	0.7930	-0.0248	0.7930
Cons	4.1400	0.0190	1.3676	0.2850	1.3676	0.2850

Source: Author´s own

Table 15

Results

	2015		*2016*		*2012 - 2016*	
Variables	Coefficient	p - value	Coefficient	p - value	Coefficient	p - value
Sustainability	0.5371	0.0000	0.2316	0.0000	0.8651	0.0000
Market Cap	0.0000	0.0000	0.0000	0.9200	0.0000	0.0000
Debt	0.0414	0.0000	0.0167	0.0060	0.0243	0.0000
Economic Growth	-0.7057	0.7850	4.9492	0.6810	0.0236	0.9770
Market Return	-1.2164	0.4240	3.0809	0.7220	-0.1404	0.7920
Exchange Rate	-0.0021	0.9730	-0.1335	0.2420	-0.0007	0.9440
Cons	0.8525	0.3830	3.7117	0.0750	1.1992	0.0000

Source: Author´s own

The results of the control variables are similar to those obtained in the case of the ROE and ROA variables.

In the case of macroeconomic control variables, they were rarely significant. These results are similar to those obtained by Hassan and Bashir (2003); Naceur (2003); Anbar and Alper (2011); Căpraru and Ihnatov (2014) and Saeed (2014).

When analyzing the results of the coefficient that CSR activities represent, we can conclude that the relationship between this type of activities and financial performance is positive and is maintained through the 5 years of study.

A summary of the results found in the three approaches performed is found in Table 16.

Table 16
A resume of the results found in the three-approach performed

	APPROACH		
	KRUSKAL - WALLIS	STRUCTURAL BREAK	PANEL DATA MODEL
Is there a relationship between CSR activities and financial performance?	Yes.	Yes.	Yes.
Why?	When performing the Kruskal Wallis test, it was found that, in three of the four variables assigned to measure the financial performance of the company, there is evidence to reject the null hypothesis of the test, which establishes an equality in financial performance of the companies.	With the exception of the Share variable, between 60 and 70 percent of the shares reject the hypothesis test that suggests a similar behavior before and after being part of the IPCS.	In 21 periods, 87.5 percent of the sample, it was found that the coefficient of the dummy variable that was assigned to measure CSR activities was significant.
What kind of relationship exists between CSR activities and financial performance?	It is not possible to define it	It is not possible to define it.	Positive.
Why?	The test does not allow to prove the relationship that exists between the variables.	The test does not allow to prove the relationship that exists between the variables.	With the exception of the Share variable where mixed results were found, in all the coefficients of the dummy variables that reflect the CSR activities, a positive coefficient can be found.
Is the relationship between CSR activities and financial performance maintained over time?	Yes.	It is not possible to define it.	Yes.

Why?	The results suggesting the difference between companies are maintained in most study periods. For ROE and PB ratio, the difference occurs in all the periods of analysis, and in the case of ROA, in the first 3 years.	The test does not allow to prove the relationship that exists between the variables.	For the ROA, ROE and PB ratio models, the coefficient of the Sustainability variable was significant in all the periods of analysis, which allows us to suggest that this relationship is maintained over time.

Source: Author´s own

Conclusions

The results of this paper are obtained from a rigorous empirical study that looks for the relationship between the financial performance and the activities related to the CSR. After exploring the relationship, using the 3 different approaches, we have strong evidence to affirm that the CSR activities positively affect the ROA, ROE and PB ratio in Mexican public firms.

The objective of performing the ANOVA and structural change tests is to analyze, in a transversal and longitudinal mode, whether there is a difference between Mexican companies that carry out CSR activities and those that do not. Based on these results, it is justifiable to include a dummy variable, which represents this type of activity, within a data panel model.

By including this dummy variable and segmenting the study period in years, it was possible to evaluate if the impact of CSR activities on financial performance is consistent over time.

In the case of financial performance, measured through the ROA, ROE, and PB ratio, it is possible to conclude that the investment of resources in the CSR activities is an investment that permeates the operation of the company through the improvement of the conditions of its stakeholders, which allows it to be an investment with benefits in the short, medium, and long terms (Cochran and Wood, 1984; Aupperle et al., 1985; Wokutch and Spencer, 1987; McGuire et al., 1988; McGuire, Schneeweiss and Sundgren, 1990;; Prahalad and Hamel, 1994; Reinhardt, 1998; Fombrun, Gardberg, and Barnett, 2000; Klein and Dawar, 2004). The results of this paper can serve as an argument for business managers to justify that investing in CSR activities is profitable, especially at times when resources are scarce.

However, there is no clear relationship between CSR activities and share returns. The share price is determined by the strengths of supply and demand. With the results found, we can conclude that CSR activities do not represent a significant determinant in the market. This could mean that investors do not consider CSR activities as a variable that determines the share price, as other fundamental or economic variables.

This should not be a surprise. As it is mentioned above, several papers have compared the performance of sustainable indexes and different benchmarks; in most of them, there are no results that allow us to conclude that the companies that make up a sustainable index have a superior financial performance (Bauer, Koedijk and Otten, 2005; Schroder, 2007; De la Torre, Galeana and Aguilasocho, 2016; and De la Torre and Enciso, 2017).

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