Volume 37, Issue 4

Corruption and business confidence: a panel data analysis

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Abstract

Decisions taken by entrepreneurs and investors are guided, to some extent, by expectations and feelings about the economy and their business. In turn, once corruption impacts the economy, and therefore affects the business environment; and since the economic environment affects business confidence, and therefore entrepreneurs' decisions, an important issue to be verified is whether corruption is capable of undermining business confidence. Although there exists evidence that corruption is harmful to the economy, there are no empirical studies regarding the effect of corruption on business confidence. Thus, this study analyzes the effect of corruption on business confidence. The effect of corruption on business confidence is estimated using panel data methodology for a sample of 40 countries (28 developed and 12 developing) covering the period between 1990 and 2013 and the period between 1995 and 2013 (annual data). The estimates are made for the total sample and then for the sample of developed countries. The results suggest corruption negatively impacts business confidence.

1. Introduction

Decisions taken by entrepreneurs and investors are guided, to some extent, by expectations and feelings about the economy and their business (Lucey and Dowling 2005). In this sense, there exist studies concerned with identifying and analyzing the determinants of business confidence (e.g., Konstantinou and Tagkalakis 2011; Montes and Bastos 2013; Khumalo 2014; Martinez-Serna and Navarro 2015). In general, the studies find that business confidence is influenced by the main macroeconomic variables – such as output, inflation and interest rates – and by economic policies.

In turn, with the advent of corruption perception indicators in the 1990s, the empirical literature on the impact of corruption on the economy has evolved (e.g., Mauro 1995 and 1997; Campos et al. 1999; Al-Marhubi 2000; Jain 2001; Svensson 2005; Aidt et al. 2008; Méndez and Sepúlveda 2006; Swaleheen 2011; Montes and Paschoal 2016). These studies point out that corruption reduces both private and public investments (Mauro 1995; Tanzi and Davoodi 1997), increases poverty and inequality (Gupta et al. 2002) and reduces government effectiveness (Montes and Paschoal 2016). In particular, the study of Avnimelech et al. (2014) analyzes the relationship between corruption and productive entrepreneurship. The authors suggest countries with high levels of corruption usually face low levels of productive entrepreneurship. In addition, the findings indicate that the negative effect is much more significant in developed countries than in developing countries. In the last instance, all these adverse consequences of corruption on the economy end up reducing development and economic activity.

Once corruption impacts the economy, and therefore affects the business environment; and since the economic environment affects business confidence, and therefore entrepreneurs' decisions, an important issue to be verified is whether corruption is capable of undermining business confidence and thus entrepreneurs' expectations about the current and future state of the economy and their business. Although there exists evidence that corruption is harmful to the economy, there are no empirical studies regarding the effect of corruption on business confidence. Therefore, there is a gap to be filled in the literature regarding the impact of corruption on entrepreneurs' expectations.

In order to contribute to the literature that analyzes the determinants of business confidence, and also to the literature that address the effects of corruption on the economy, this study addresses the relationship between corruption and business confidence. In fact, the present study analyzes the effect of corruption on business confidence. The hypothesis is that since corruption affects the economic environment (as shown by the literature), thus corruption undermines business confidence related to the environment in which firms are inserted and contributes to the formation of pessimistic expectations regarding the future of the economy. This hypothesis is in line with the hypothesis presented by Avnimelech et al. (2014) which suggest there is a negative effect of corruption on national entrepreneurial activity. Besides, according to the "grease the wheels" hypothesis (Huntington 1968; Leff 1964; Leys 1965), corruption might be less harmful or even beneficial to economic performance in countries with inefficient bureaucracy. Often such inefficient bureaucratic institutions exist in non-developed countries (Avnimelech et al. 2014). Therefore, we suggest that the negative effect of corruption on business confidence is stronger in developed countries than non-developed countries

The effect of corruption on business confidence is estimated using a sample of 40 countries (28 developed and 12 developing) covering the period between 1990 and 2013 and the period between 1995 and 2013 (annual data) - the sample period and countries were defined by data availability. As dependent variable in the estimates, we use the Business Confidence Index (BCI) – obtained from the Organization for Economic Cooperation and

Development (OECD) database. With respect to the main explanatory variable of the analysis, we use an indicator that captures the perception about corruption: the Corruption Perception Index (CPI) – obtained from Transparency International. In order to give robustness to the results, all estimates are repeated using another corruption perception indicator: the Corruption Index (COR) – obtained from the International Country Risk Guide. Because the indicators have different availabilities, the analysis considers the period between 1995 and 2013 for the CPI and between 1990 and 2013 for the COR.

Based on panel data methodology, the estimates are made for the total sample and then for the sample of developed countries. The results suggest corruption negatively impacts business confidence. This evidence is observed in the estimates using both the total sample and the sample of developed countries. In line with the findings of Avnimelech et al. (2014) for the relationship between corruption and productive entrepreneurship, which show a stronger adverse effect in developed countries, the results presented in our study point out that the adverse effect of corruption on business confidence is also stronger in developed countries.

2. Business confidence and corruption: some evidence from the literature

Confidence indicators are recognized in the literature as having predictive capacity concerning economic performance. Although most of the literature on confidence indicators provides evidence based on consumer confidence (e.g., Fuhrer 1993; Carroll et al. 1994; Bram and Ludvigson 1998; Howrey 2001; Doms and Morin 2004; Ludvigson 2004; Easaw et al. 2005; Taylor and McNabb 2007), empirical studies suggest that business confidence indicators are better to predict economic fluctuations. Thus, part of the literature is aimed at analyzing the information contained in business confidence indicators and their capacity to predict economic activity (e.g., Bodo et al. 2000; Hansson et al. 2005; Taylor and McNabb 2007; Claveria et al. 2007; Holmes and Silverstone 2009; Klein and Ozmucur 2010; Cesaroni 2011; Cover and Lee 2015). According to Ng (1992), the possibility of a collapse in business confidence and the inability to avoid recessions create the need to understand the determinants of entrepreneurs' expectations and business confidence.

With respect to the determinants of business confidence, There exists literature addressing the issue (e.g., Ferreira et al. 2008; Konstantinou and Tagkalakis 2011; Montes 2013; Montes and Bastos 2013; Khumalo 2014; Martinez-Serna and Navarro 2015). In general, these studies find that business confidence is affected by the main macroeconomic variables – such as output, inflation and interest rates – and by economic policies.

The literature addressing the effects of corruption on the economy emerged in the 1960s and still stresses the hypothesis of loss of efficiency caused by corruption (e.g., McMullan 1961; Myrdal 1968; Krueger 1974; Shleifer and Vishnny 1993; Mauro 1995; Tanzi and Davoodi 1997; Montes and Paschoal 2016). The idea is that corruption slows down business, reduces government effectiveness and thus economic growth, as it undermines allocative efficiency in both the private and public sectors.

Since the mid-1990s, with the advent of corruption perception indicators, the empirical literature on the impact of corruption on the economy has developed (e.g., Shleifer and Vishny 1993; Mauro 1995 and 1997; Tanzi and Davoodi 1997; Campos et al. 1999, Al-Marhubi 2000; Li et al. 2000; Mo 2001; Gupta et al. 2002; Svensson 2005; Reinikka and Svensson 2004; Aidt et al. 2008; Mendez and Sepúlveda 2006; Swaleheen 2011; de Mendonça and Fonseca 2012; Montes and Paschoal 2016). Akçay (2006) presents a summary of the empirical studies on the effects of corruption on the economy. Based on the findings provided by these studies, several authors point out that the main damage caused by corruption on the economy is the slowdown in economic growth and development. However,

the impact of corruption on economic growth and development occurs through different channels, such as through private investment (Mauro 1995), public investment (Tanzi and Davoodi 1997), allocation of resources for human development (Mauro 1998; Gupta et al. 2002), and government effectiveness (Montes and Paschoal 2016).

Aiming at investigating the relationship between corruption and productive entrepreneurship, Avnimelech et al. (2014) uses OLS regression to estimate such relationship. The main independent variable was the *Corruption Perception Index* (CPI) score (obtained from Transparency International). The authors make use of two sub-samples: 70 less-developed countries and 34 OECD countries. The findings suggest countries with high levels of corruption usually face low levels of productive entrepreneurship. Besides, the results also suggest that the negative effect is much more significant in developed countries than in developing countries. Hence, the results stress the need to fight corruption not only in developing countries and suggests significant gains from anti-corruption efforts even and maybe especially in the western developed world.

Regarding the effects of corruption on business confidence, there are no empirical studies addressing this relationship. Therefore, there is a gap to be filled in the literature that assesses the impact of corruption on the economy. In addition to the economic conditions, corruption can influence entrepreneurs' perception about the institutional environment in which the firms are inserted. In this sense, the present study explores another channel through which corruption affects the economy: the business confidence transmission channel. The business confidence transmission channel is addressed by other studies, such as Montes and Bastos (2013) and Montes (2013).

3. Data and methodology

Business confidence is measure through indicators that take into account market research about the current and future state of the business and the economy. The Organization for Economic Co-operation and Development (OECD) database provides the Business Confidence Index (*BCI*) for 40 countries (28 developed and 12 developing) (Table A.1 in the Appendix describes the countries). The *BCI* is based on enterprises' assessment of production, orders and stocks, as well as its current position and expectations for the immediate future (OECD 2017). We use the *BCI* as dependent variable.

Regarding corruption measures, we follow Montes and Paschoal (2016) and use two corruption perception indicators: the Corruption Perception Index (*CPI*) obtained from Transparency International, and the Corruption Index (*COR*) obtained from the International Country Risk Guide (ICRG).

The *CPI* scores countries and territories based on how corrupt their public sector is perceived to be. A country or territory's score indicates the perceived level of public sector corruption on a scale of 0 - 100, where 0 means that a country is perceived as highly corrupt and 100 means it is perceived as very clean. In order to facilitate the interpretation of the estimates, the values for the CPI were multiplied by -1, varying on a scale from -100 to 0. Thus, when the CPI increases (approaching to zero) the corruption perception decreases, and when the CPI decreases (Approaching to -100) the corruption perception increases.

In turn, the *COR* considers the assessment of international experts about corruption within the political system. The indicator aims to capture the level at which corruption distorts the economic and financial environment, reduces both government and business effectiveness, and introduces instability to the political process. The index ranges from 0 (highest corruption perception in the public sector) to 6 (lowest corruption perception in the public sector). The index was multiplied by -1 and therefore ranges from -6 (highest corruption perception) to 0 (lowest corruption perception).

We also use the following control variables considered as relevant by the literature (see, for instance, Konstantinou and Tagkalakis (2011), Montes and Bastos (2013) Khumalo (2014) and, Drakos and Kallandranis (2015)): GDP growth (GROWTH); inflation rate (INF); real interest rate (RIR), and; a dummy variable for the subprime crisis (*SUBPRIME*), which is equal to '1' in the years of 2008 and 2009, and '0' otherwise. In addition, we include a variable related to the flow of information, measured by the number of internet users (INTERNET). Table A.2 in the Appendix presents the descriptive statistics of the variables. The analysis runs from 1990 until 2013. However, due to the availability of data for the CPI, the estimates using this indicator cover the period between 1995 and 2013. The model to be estimated is:

$$BCI_{i,t} = \alpha + \beta X_{i,t} + \varphi_1 corruption_{i,t} + \varepsilon_{i,t} \qquad (1)$$

where, the subscript $i = 1,2,…,40$ is the country; $t = 1,2,…,24$ is the period, and $\varepsilon_{i,t}$ is the disturbance. *X* represents the vector of control variables: *GROWTH*, *INF*, *RIR*, *INTERNET* and *SUBPRIME*. The variable "*corruption*" represents both the *CPI* and *COR*.

This study uses panel data analysis. Besides usual OLS method for panel data analysis, we make use of dynamic panel data framework (D-GMM and S-GMM). As pointed out by Arellano and Bond (1991), an advantage of using the dynamic panel data method (GMM) is that it eliminates the non-observed effects on the regressions and the estimates are reliable even in the case of omitted variables. In particular, the use of instrumental variables allows the estimation of parameters more consistently, even in the case of endogeneity in explanatory variables and the occurrence of measurement errors (Bond et al. 2001).

The empirical model developed in this study is subject to the above-mentioned problems. In short, not all explanatory variables of the model are known and measurable. In addition, the growth rate of real GDP can be influenced by business confidence, which, in turn, suggests a simultaneity problem. Furthermore, regarding the endogeneity problem, for example, a macroeconomic shock affects business confidence and thereby the growth rate of real GDP.

The model proposed by Arellano and Bond (1991) consists of the estimation of first-difference GMM panel data as a way of eliminating non-observed effects. However, Alonso-Borrego and Arellano (1999), and Blundell and Bond (1998) showed that the first-difference GMM has a bias (for large and small samples) and low accuracy. Moreover, the use of lags can generate weak instruments (Staiger and Stock 1997). As a way of mitigating the weakness problem in the D-GMM, Arellano and Bover (1995) and Blundell and Bond (1998) suggest the inclusion of moment conditions. Hence, S-GMM combines regression equations in differences and in levels into one system and uses lagged differences and lagged levels as instruments.

Although D-GMM and S-GMM estimation approaches are suitable for a small number of time periods (t) and a large number of individuals (i), in the case of small samples, when the instruments are too many, they tend to over-fit the instrumented variables creating a bias in the results (Roodman 2009). Therefore, with the objective of avoiding the use of an excessive number of instruments in the regressions and thus lose the power of tests, the number of instruments/number of cross-sections ratio must be less than 1 in each regression (Roodman 2009). With respect to the instruments, besides the use of lagged regressors as instruments, we also use the following variables: "exports" (obtained from the World Bank), "economic globalization" (obtained from the Quality of Government Institute) and "political and economic risk components" (obtained from the ICRG). Moreover, in order to confirm the validity of the instruments in the models, the test of over-identifying restrictions (J-test) was used as suggested by Arellano (2003). In addition, tests of first-order (AR1) and second-order (AR2) serial correlation were performed.

4. Results

Table 1 presents the estimates for the total sample and table 2 presents the estimates for the 28 developed countries. Both tables 1 and 2 show estimates using the *CPI* as corruption indicator. In turn, aiming at providing robustness, table 3 presents the estimates for the full sample as well as for the 28 developed countries, using the *COR* as corruption indicator. One can observe that all GMM regressions accept the null hypothesis in the Sargan tests (J-statistic) and thus the over-identifying restrictions are valid. Both AR(1) and AR(2) tests reject the hypothesis of the presence of serial autocorrelation in the estimates.

All estimated coefficients for both measures of corruption perception present negative signals, and most of them have statistical significance. This evidence suggests corruption undermines business confidence. Regarding the results for both COR and CPI, it is important to note that the estimated coefficients from the sample of developed countries have greater magnitude than the coefficients obtained from the total sample. This result suggests corruption perception has greater impact on business confidence in developed countries. The findings for the effect of corruption on business confidence are in line with the results presented by Avnimelech et al. (2014) for the relationship between corruption and productive entrepreneurship, which show a stronger adverse effect in developed countries.

The estimated coefficients for the control variables corroborate the results found by other studies (e.g., Konstantinou and Tagkalakis 2011; Montes and Bastos 2013; Khumalo 2014; Drakos and Kallandranis 2015).

The results indicate that the effect of GROWTH on business confidence is positive and significant in all estimates. Estimates for the effect of INF present negative signals, and most coefficients have statistical significance. The findings suggest high inflation rates reflect unstable and therefore unfavorable macroeconomic environments, which undermine business confidence. The estimated effect for the real interest rate (RIR) is negative and statistically significant in all estimates. In addition, the subprime crisis negatively affected business confidence. In turn, the estimated coefficients for the INTERNET variable are positive and have statistical significance in almost all estimates.

Table 1. Estimates for the effect of corruption (*CPI*) on *BCI* (total sample)

Estimator:	FOLS			S-GMM			D-GMM		
variables:	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
BCI (-1)				-0.650***	-0.651***	-0.708***	-0.689***	-0.693***	-0.626***
				(0.092)	(0.018)	(0.030)	(0.014)	(0.013)	(0.025)
GROWTH	0.275***	0.297***	0.285***	0.758***	0.706***	0.690***	0.638***	0.654***	0.546***
	(0.056)	(0.059)	(0.067)	(0.114)	(0.009)	(0.025)	(0.006)	(0.010)	(0.018)
INF	-0.012	-0.011	-0.007	-0.115***	-0.049***	-0.037**	-0.034***	-0.026***	-0.071***
	(0.012)	(0.011)	(0.011)	(0.033)	(0.009)	(0.014)	(0.003)	(0.003)	(0.013)
RIR	-0.023***	-0.017*	-0.020*	-0.060**	-0.013***	-0.030**	-0.043***	-0.036***	-0.021*
	(0.009)	(0.009)	(0.011)	(0.027)	(0.004)	(0.013)	(0.002)	(0.002)	(0.012)
INTERNET		0.008**	0.007		0.013***	0.016***		0.005***	0.008**
		(0.003)	(0.005)		(0.001)	(0.002)		(0.001)	(0.003)
CPI			-0.007			-0.018**			-0.038*
			(0.017)			(0.008)			(0.022)
SUBPRIME	-1.751***	-1.844***	-1.891***	-1.214*	-1.292***	-1.307***	-1.501***	-1.496***	-1.547***
	(0.320)	(0.306)	(0.305)	(0.709)	(0.140)	(0.132)	(0.147)	(0.148)	(0.182)
N. Obs	737	733	626	580	580	464	578	577	463
Adj. R²	0.319	0.334	0.388						
N. inst./N. cross sec.				0.3	0.925	0.821	0.975	0.975	0.872
J statistic				4.938	38.356	32.79	37.473	37.046	33.124
P-value (J stat.)				0.667	0.17	0.136	0.313	0.288	0.193
AR(1)				-0.365	-0.353	-0.377	-3.103	-3.007	-3.039
P-value (AR1)				0.000	0.000	0.000	0.002	0.003	0.002
AR(2)				-0.065	-0.067	-0.015	-1.524	-1.195	-1.545
P-value (AR2)				0.141	0.131	0.772	0.127	0.232	0.122

White's heteroskedasticity consistent covariance matrix was applied in all regressions. Standard errors are in parentheses. FOLS fixed effects (cross-section). D-GMM – uses two-step of Arellano and Bond (1991) without time period effects. S-GMM – uses two-step of Arellano and Bover (1995) without time period effects. Constant is omitted for convenience. Significance levels: *** indicates significance at the .01 level, ** indicates significance at the .05 level and * indicates significance at the .10 level.

Table 2. Estimates for the effect of corruption (*CPI*) on *BCI* (developed countries)

Estimator:	FOLS			S-GMM			D-GMM		
variables:	Model 1	Model 2	Model 4	Model 1	Model 2	Model 4	Model 1	Model 2	Model 4
BCI (-1)				-0.385***	-0.464***	-0.545***	-0.463***	-0.502***	-0.568***
				(0.075)	(0.081)	(0.061)	(0.069)	(0.060)	(0.039)
GROWTH	0.210***	0.225***	0.200***	0.590***	0.663***	0.576***	0.568***	0.591***	0.512***
	(0.054)	(0.062)	(0.073)	(0.069)	(0.041)	(0.050)	(0.120)	(0.075)	(0.034)
INF	-0.105*	-0.095*	-0.107	-0.054	-0.059*	-0.121*	-0.255***	-0.075**	-0.141***
	(0.058)	(0.057)	(0.082)	(0.031)	(0.035)	(0.070)	(0.077)	(0.037)	(0.034)
RIR	-0.073***	-0.059**	-0.057*	-0.255***	-0.107**	-0.141***	-0.564***	-0.196***	-0.051***
	(0.023)	(0.026)	(0.034)	(0.064)	(0.049)	(0.052)	(0.120)	(0.054)	(0.018)
INTERNET		0.003	0.002		0.013***	0.020***		0.011***	0.019***
		(0.004)	(0.005)		(0.003)	(0.004)		(0.003)	(0.004)
CPI			-0.019			-0.071***			-0.052*
			(0.021)			(0.021)			(0.029)
SUBPRIME	-1.507***	-1.513***	-1.596***	-1.658***	-1.660***	-1.856***	-1.870***	-1.473***	-1.976***
	(0.333)	(0.315)	(0.321)	(0.456)	(0.422)	(0.358)	(0.662)	(0.427)	(0.301)
N. Obs	541	537	436	434	430	327	435	435	323
Adj. R²	0.275	0.285	0.299						
N. inst./N. cross sec.				0.778	0.778	0.808	0.704	0.741	0.808
J statistic				17.198	15.587	15.97	19.603	21.041	18.611
P-value (J stat.)				0.373	0.41	0.315	0.143	0.101	0.180
AR(1)				-0.365	-0.37	-0.372	-2.999	-2.898	-2.943
P-value (AR1)				0.000	0.000	0.000	0.003	0.004	0.003
AR(2)				-0.086	-0.072	-0.05	-1.519	-1.584	-1.362
P-value (AR2)				0.103	0.174	0.431	0.129	0.113	0.173

White's heteroskedasticity consistent covariance matrix was applied in all regressions. Standard errors are in parentheses. FOLS fixed effects (cross-section). D-GMM – uses two-step of Arellano and Bond (1991) without time period effects. S-GMM – uses two-step of Arellano and Bover (1995) without time period effects. Constant is omitted for convenience. Significance levels: *** indicates significance at the .01 level, ** indicates significance at the .05 level and * indicates significance at the .10 level.

Table 3. Estimates for the effect of corruption (*COR*) on (BCI) (total sample and developed countries)

	Full Sample			Developed Countries		
Estimator:	**FOLS**	**S-GMM**	**D-GMM**	**FOLS**	**S-GMM**	**D-GMM**
variables:	Model 3	Model 3	Model 3	Model 3	Model 3	Model 3
BCI (-1)		-0.662***	-0.645***		-0.551***	-0.508***
		(0.014)	(0.016)		(0.067)	(0.073)
GROWTH	0.297***	0.715***	0.564***	0.223***	0.675***	0.596***
	(0.059)	(0.009)	(0.016)	(0.060)	(0.062)	(0.092)
INF	-0.012	-0.041***	-0.030***	-0.121**	-0.052*	-0.084**
	(0.011)	(0.007)	(0.006)	(0.050)	(0.030)	(0.043)
RIR	-0.017*	-0.015***	-0.043***	-0.070***	-0.200***	-0.228***
	(0.009)	(0.003)	(0.003)	(0.021)	(0.054)	(0.040)
INTERNET	0.009***	0.016***	0.005**	0.005	0.014***	0.021***
	(0.003)	(0.001)	(0.002)	(0.004)	(0.004)	(0.004)
COR	-0.079	-0.184***	-0.255**	-0.277**	-0.403***	-0.533*
	(0.087)	(0.030)	(0.116)	(0.124)	(0.087)	(0.306)
SUBPRIME	-1.849***	-1.355***	-1.789***	-1.524***	-1.559***	-1.728**
	(0.301)	(0.123)	(0.196)	(0.319)	(0.467)	(0.782)
N. Obs	730	580	605	534	438	437
Adj. R²	0.334			0.295		
N. inst./N. cross sec.		0.975	0.95		0.889	0.852
J statistic		38.952	36.247		13.812	18.422
P-value (J stat.)		0.185	0.237		0.68	0.300
AR(1)		-0.354	-5.146		-0.345	-2.929
P-value (AR1)		0.000	0.000		0.000	0.003
AR(2)		-0.065	-1.147		-0.083	-1.408
P-value (AR2)		0.143	0.251		0.114	0.159

White's heteroskedasticity consistent covariance matrix was applied in all regressions. Standard errors are in parentheses. FOLS fixed effects (cross-section). D-GMM – uses two-step of Arellano and Bond (1991) without time period effects. S-GMM – uses two-step of Arellano and Bover (1995) without time period effects. Constant is omitted for convenience. Significance levels: *** indicates significance at the .01 level, ** indicates significance at the .05 level and * indicates significance at the .10 level.

5. Discussion

There is a vast literature that relates corruption with economic activity (e.g., Mauro 1995 and 1997; Campos et al. 1999; Al-Marhubi 2000; Jain 2001; Svensson 2005; Aidt et al. 2008; Méndez and Sepúlveda 2006; Swaleheen 2011; Montes and Paschoal 2016). However, the harmful effects of corruption on economic performance may occur through different channels. This study aimed to investigate whether corruption impacts business confidence, and therefore, whether business confidence could represent a potential transmission channel.

Studies find that business confidence is influenced by the main macroeconomic variables – such as output, inflation and interest rates – and by economic policies. Our findings corroborate the results obtained by recent empirical research (e.g., Konstantinou and Tagkalakis 2011; Montes and Bastos 2013; Khumalo 2014; Drakos and Kallandranis 2015).

However, in the present study we stress that beyond the economic conditions, the institutional environment influences entrepreneurs' perception regarding the future of the economy and their businesses. Contrary to the "grease the wheels" hypothesis, our findings indicate that corruption perception undermines business confidence. Since business confidence represents a transmission mechanism of the expectations channel, production and investment decisions might be negatively affected in countries with higher levels of corruption, because in such countries the level of business confidence is low. Our evidences also indicate that these negative effects are stronger in developed countries. These results are in line with previous findings, such as in Avnimelech et al. (2014). According to these

authors, countries with higher levels of corruption face lower levels of productive entrepreneurship, and there is a stronger adverse effect in developed countries.

Mauro (1997) points out that corruption has always existed and will continue to exist until societies find effective mechanisms to eliminate it. In addressing the determinants of corruption, Jain (2001) stresses that when corruption is analyzed, one must have in mind that to some extent it comes from the existence of discretionary public power, rent-seeking behavior, and weak legal institutions. Therefore, the strengthening of the legal system and the reduction of discretionary actions of the government should be considered as important anti-corruption measures. Thus, combating corruption is likely to bring benefits to economic performance since it will contribute to the formation of expectations by entrepreneurs.

6. Conclusion

Business confidence plays a key role in production and investment decisions. Due to the importance that business confidence plays in entrepreneurs' decision-making process, and due to the harmful effects of corruption on the economy, this study investigates whether corruption perception affects business confidence.

The findings suggest corruption negatively affects business confidence. This evidence is observed for the full sample and for the sample of developed countries. However, the estimates indicate the effect of corruption on business confidence is even more harmful in developed countries. Therefore, societies should pressure governments to adopt policies to reduce corruption because lower levels of corruption bring benefits to the economic activity through business confidence.

7. References

Aidt, T., Dutta, J., Sena, V. (2008). "Governance Regimes, Corruption and Growth: Theory and Evidence." *Journal of Comparative Economics*, 36, 195-220.

Akçay, S. (2006). "Corruption and Human development." *Cato Journal*, 26 (1), 29-48.

Al-Marhubi, F. A. (2000). "Corruption and inflation." *Economics Letters*, 66 (2), 199-202.

Alonso-Borrego, C., Arellano, M. (1999). "Symmetrically normalized instrumental-variable estimation using panel data." *Journal of Business and Economic Statistics*, 17 (1), 36–49.

Arellano, M. (2003). Panel Data Econometrics. Oxford University Press.

Arellano, M., Bond, S. (1991). "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations." *Review of Economic Studies*, 58 (2), 277–297.

Arellano, M., Bover, O. (1995). "Another look at the instrumental variables estimation of error-components models." *Journal of Econometrics*, 68 (1), 29–51.

Avnimelech, G., Zelekha, Y., Sharabi, E. (2014). "The effect of corruption on entrepreneurship in developed vs non-developed countries." *International Journal of Entrepreneurial Behavior and Research*, 20 (3), 237–262.

Blundell, R, Bond, S. (1998). "Initial conditions and moments restrictions in dynamic panel data models." *Journal of Econometrics*, 86 (1), 115–143.

Bodo, G., Golinelli, R., Parigi, G. (2000). "Forecasting industrial production in the Euro area." *Empirical Economics*, 25 (4), 541–561.

Bram, J., Ludvigson, S. (1998). "Does consumer confidence forecast household expenditure? A sentiment index horse race." *Federal Reserve Bank of New York Economic Policy Review* 4, 59–79.

Campos, E., Lein, D., Pradhan, S. (1999). "The Impact of Corruption on Investment: Predictability Matters." *World Development*, 27 (6), 1059-1067.

Carrol, C.D., Fuhrer, J.C., Wilcox, D.W. (1994). "Does consumer sentiment forecast household spending? If so, why?" *The American Economic Review*, 85 (5), 1397–1408.

Cesaroni, T. (2011). "The cyclical behavior of the Italian business survey data." *Empirical Economics*, 41, 747-768.

Claveria, O., Pons, E., Ramos, R. (2007). "Business and consumer expectations and macroeconomic forecasts." *International Journal of Forecasting*, 23 (1), 47-69.

Cover, J.P., Lee, H.-J. (2015). "Do market prices aggregate information about macroeconomic uncertainty (or risk)?" *Applied Economics*, 47 (42), 4511-4534.

De Mendonça, H., Fonseca, A. D. (2012). "Corruption, Income, and Rule of Law: empirical evidence from developing and developed economies." *Brazilian Journal of Political Economy*, 32 (2), 305-314.

Doms, M., Morin, N. (2004). "Consumer sentiment, the economy, and the news media." *Federal Reserve Bank of San Francisco*, WP 2004-09.

Drakos, K., Kallandranis, C. (2015). "A note on the effect of terrorism on economic sentiment." *Defence and Peace Economics*, 26 (6), 600-608.

Easaw, J.Z., Garratt, D., Heravi, S. (2005). "Does consumer sentiment accurately forecast UK household consumption? Are there any comparisons to be made with the US." *Journal of Macroeconomics*, 27, 517–553

Ferreira, E.,Martinez, M.I., Navarro, E., Rubio, G. (2008). "Economic Sentiment and Yield Spreads in Europe." *European Financial Management*, 14 (2), 206–21.

Fuhrer, J. (1993). "What role does consumer sentiment play in the U.S. macroeconomy?" *New England Economic Review*, 32-44 (January/February).

Gupta, S., Davoodi, H., Alonso-Terme, R. (2002). "Does Corruption affect income inequality and poverty?" *Economics of Governance*, 3 (1), 23-45.

Hansson, J., Jansson, P., Lof, M. (2005). "Business survey data: do they help in forecasting GDP growth?" *International Journal of Forecasting*, 21 (2), 377-389.

Holmes, M.J., Silverstone, B. (2009). "Business confidence and cyclical turning points: a Markov-switching approach." *Applied Economics Letters*, 17 (3), 229-233.

Howrey, E.P. (2001). "The predictive power of the index of consumer sentiment." *Brookings Papers on Economic Activity,* 32 (1), 175-216.

Huntington, S.P. (1968). Political order in changing societies. Yale University Press, New Haven, CT.

Jain, A. K. (2001). "Corruption: A review." *Journal of Economic Surveys*, 15 (1), 71-121.

Khumalo, J. (2014). "Business confidence and inflation in RSA: Variance decomposition and general impulse response function analysis." *Mediterranean Journal of Social Sciences*, 5 (16), 128-134.

Klein, L. R., Ozmucur, S. (2010). "The use of consumer and business surveys in forecasting." *Economic Modelling*, 27 (6), 1453-1462.

Konstantinou, P., Tagkalakis, A. (2011). "Boosting confidence: Is there a role for fiscal policy?" *Economic Modelling*, 28 (4), 1629-1641.

Krueger, A. O. (1974). "The political economy of Rent-Seeking Society." *American Economic Association,* 64 (3): 291-303.

Leff, N.H. (1964). "Economic development through bureaucratic corruption." *American Behavioral Scientist*, 29 (3), 8-14.

Leys, C. (1965). "What is the problem about corruption?" *Journal of Modern African Studies*, 3 (2), 215-230.

Li, H., Xu, L. C., Zou, H.-F. (2000). "Corruption, Income Distribution and Growth." *Economics and Politics,* 12 (2): 954-1985.

Lucey, B., Dowling, M. (2005). "The role of feelings in investor decision-making." *Journal of Economic Surveys*, 19 (2), 211-237

Ludvigson, S. (2004). "Consumer confidence and consumer spending." *Journal of Economic Perspectives*, 18 (2), 29–50.

Martínez-Serna, M. I., Navarro, E. (2015). "Interest rate volatility and business cycle expectations." *International Finance*, 18 (1), 69-91.

Mauro, P. (1995). "Corruption and Growth." *The Quarterly Journal of Economics*, 110 (3), 681-712.

Mauro, P. (1997). The effects of corruption on growth, investment, and government expenditure: A cross-country analysis. In: K. A. Elliott, Corruption and the Global Economy. Washington DC: Institute for International Economics.

McMullan, M. (1961). "A Theory of Corruption Based on a Consideration of Corruption in the Public Services and Governments of British Colonies and ex-Colonies in West Africa." *The Sociological Review*, 9 (2), 191-201.

Mendez, F., Sepulveda, F. (2006). "Corruption, growth and political regimes: Cross country evidence." *European Journal of Political Economy*, 22, 82-98.

Mo, P. H. (2001). "Corruption and Economic Growth." *Journal of Comparative Economics*, 29 (1): 66-79.

Montes, G.C. (2013). "Credibility and monetary transmission channels under inflation targeting: an econometric analysis from a developing country." *Economic Modelling*, 30 (C), 670-684.

Montes, G.C., Bastos, J.C.A. (2013). "Economic policies, macroeconomic environment and entrepreneurs' expectations: Evidence from Brazil." *Journal of Economic Studies*, 40 (3), 334-354.

Montes, G.C., Paschoal, P.C. (2016). "Corruption: what are the effects on government effectiveness? Empirical evidence considering developed and developing countries." *Applied Economics Letters*, 23 (2), 146-150.

Myrdal, G. (1968). Teoria Econômica e Regiões Subdesenvolvidas. 2º Edição, Editora Saga. New York: Harper and Brother.

Ng, Y., (1992). "Business confidence and depression prevention: A mesoeconomic perspective." *The American Economic Review*, 82 (2), 365-371.

OECD. (2017). Business confidence index (BCI) (indicator). doi: 10.1787/3092dc4f-en (Accessed on 07 May 2017).

Reinikka, R., Svensson, J. (2005). "Fighting corruption to improve schooling: evidence from a newspaper campaign in Uganda." *Journal of the European Economic Association*, 3**,** 259–267.

Roodman, D. (2009). "How to do xtabond2: an introduction to difference and system GMM in stata." *Stata Journal*, 9 (1), 86-136.

Shleifer, A., Vishny, R. (1993). "Corruption." *The Quarterly Journal of Economics*, 108 (3): 599-617.

Staiger, D, Stock, J.H. (1997). "Instrumental variables regression with weak instruments." *Econometrica*, 65 (3), 557-586.

Svensson, J. (2005). "Eight questions about corruption." *Journal of Economic Perspectives*, 19 (3), 19-42.

Swaleheen, M. (2011). "Economic growth with endogenous corruption: An empirical study." *Public Choice*, 146 (1), 23-41.

Tanzi, V., Davoodi, H. (1997). Corruption, public investment, and growth. IMF Working Paper 97/139.

Taylor, K., McNabb, R. (2007). "Business cycles and the role of confidence: evidence for Europe." *Oxford Bulletin of Economics and Statistics*, 69 (2), 185-208.

Appendix

Table A1. *List of countries*

Developed countries		Developing countries
Australia	Japan	Brazil
Austria	Korea	Chile
Belgium	Luxembourg	China
Canada	Netherlands	Hungary
Czech Republic	New Zealand	India
Denmark	Norway	Indonesia
Estonia	Portugal	Mexico
Finland	Slovak republic	Latvia
France	Slovenia	Poland
Germany	Spain	Russia
Greece	Sweden	South Africa
Ireland	Switzerland	Turkey
Israel	United Kingdom	
Italy	United States	

Table A2. Descriptive statistics

Full sample	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
BCI	99.94	100.16	108.84	83.66	2.00	825
CPI	-63.07	-66.00	-17.00	-100.00	22.09	740
COR	-3.99	-4.00	-0.33	-6.00	1.31	924
GROWTH	2.95	3.02	14.28	-14.72	3.59	935
INF	17.37	3.02	2947.73	-4.48	142.15	939
INTERNET	32.71	23.08	95.05	0.00	31.30	926
RIR	8.47	4.76	824.56	-43.12	37.75	854
Developed countries	**Mean**	**Median**	**Maximum**	**Minimum**	**Std. Dev.**	**Observations**
BCI	99.96	100.14	105.50	92.95	1.60	613
CPI	-70.00	-75.00	-29.90	-100.00	18.67	497
COR	-4.50	-5.00	-2.00	-6.00	1.10	632
GROWTH	2.37	2.56	11.18	-11.61	2.83	638
INF	3.00	2.34	32.86	-4.48	3.04	635
INTERNET	39.26	37.99	95.05	0.00	32.60	633
RIR	6.92	4.64	824.56	-6.94	35.33	574