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Published online: 03 Jan 2017.

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Some additional evidence on the interplay between corruption, tax policy and firm entry using US states

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ABSTRACT

The effects that corruption and tax policy have on entrepreneurship and firm growth have been often studied in the literature. This current article adds to that literature by evaluating how the interaction effect between corruption and tax policy influences firm entry at the US state level, using a panel data set of all 50 US states between 2001 and 2014. Overall, the findings are consistent with the literature and suggest that while high levels of corruption and relatively burdensome tax policy have a negative effect on firm entry, high levels of corruption tend to dampen the negative effects associated with relatively high tax rates. Potential policy implications are discussed within this article.

I. Introduction

There is a large body of academic research evaluating the interconnectedness and overall effect that corruption and taxation have on firm entry and entrepreneurial behaviour (Dreher and Gassebner 2013; Djankov et al. 2002; Klapper, Laeven, and Rajan 2006; Shleifer and Vishny 1993; Bruce and Mohsin 2006; Cullen and Gordon 2007; Mitchell and Campbell 2009; Glaeser and Saks 2006; Gentry and Hubbard 2000; Holtz-Eakin 2000). Analyses have considered how these factors influence entrepreneurship and firm entry through both cross-country and within-country studies. In general, by applying a multitude of measures for entrepreneurship, tax policy and corruption, the literature suggests that while relatively high rates of corruption tend to dampen firm entry and entrepreneurship, the effect of tax policy appears to be somewhat more ambiguous.

Belitski, Chowdhury, and Desai (2016) add to this research by considering how the interactive effect between corruption and taxation impacts firm entry. By employing a panel data set of 72 countries over the period 2005–2011, their findings, which are robust to a number of specifications, suggest that both relatively higher rates of taxation and corruption are consistently associated with lower rates of firm entry. However, the interaction between

corruption and taxation indicates that where tax rates are relatively high, corruption can mitigate the negative effect associated with tax policy on firm entry.

This current article adds to the findings in Belitski, Chowdhury, and Desai (2016) and the literature as a whole by addressing this issue within the US context: how does the interaction between corruption and tax policy influence firm entry? In order to carry out this research question, the current article employs a panel data set of all 50 US states covering the years 2001–2014. Overall, the results indicate that while relatively high tax rates and levels of corruption negatively influence firm entry, corruption appears to mitigate the negative impact from higher tax rates when these two variables are interacted.

While the results may not necessarily be generalizable given only one country under consideration, this article does provide a number of contributions to the literature and potential policy implications. Most important, by only considering one country it is possible to immediately control for many socio-economic and ethnolinguistic differences that hamper international studies (Glaeser and Saks 2006). Further, the results also indicate that even in a highly developed country, corruption can positively influence firm entry in a high-tax environment.

Additionally, these findings provide evidence and policy implications as to how, if at all, federalism and especially market preserving federalism might impact the outcomes observed (Weingast 1995).

The remainder of the article is structured as follows: Section II briefly discusses the data and empirical specification, Section III presents the results along with a discussion of potential implications and Section IV concludes.

II. Data and model specification

In order to address the empirical question laid out earlier, I construct a panel data set of all US states between 2001 and 2014. To measure firm entry (the dependent variable of interest), I employ the private sector establishment birth rate by state taken from the Bureau of Labor Statistics' *Business Employment Dynamics Data*.[1] These are quarterly data, averaged over each year in order to derive the establishment birth rate.

The main independent variables of interest include measures of tax policy and corruption levels by state. The first of these is the top marginal corporate income tax rate by state and year, compiled by the National Tax Foundation.[2] The second independent variable of interest, corruption, includes a measure of total state and local public officials who were convicted of corruption by year. These data were taken from the Department of Justice's *Report to Congress on the Activities and Operations of the Public Integrity Section*.[3] Although this measure does have its drawbacks, especially since if anything it

underestimates actual corruption within a state, it is still nevertheless the most widely used measure of corruption at the state level. Further, unlike other measures of corruption that exist, it provides information on an annual basis.[4] This variable is converted into convictions per 100,000 citizens for comparison purposes.[5] The empirical model employed takes the following form:

$$FirmEntry_{it} = \alpha + \beta_1 Corruption_{it} + \beta_2 CIT_{it} \\ + Z'_{it}\beta_3 + \sigma_i + \mu_t + \varepsilon_{it} \quad (1)$$

Here, $FirmEntry_{it}$ is the firm birth rate in state i and year t, while $Corruption_{it}$ and CIT_{it} are the levels of corruption per 100,000 people and top corporate income tax rate by state and year, respectively. Z'_{it} is a vector of socioeconomic control variables common to the literature. These include population growth per year, median age, the percentage of the population that is male, percentage of the population that is white, population density, a state's unemployment rate, real per capita GDP (in $10,000) and the homeownership rate by state. Finally, σ_i and μ_t are a set of state and year fixed effects, respectively.

One issue may be potential simultaneity between the dependent variable and some independent variables of interest. Namely, firm entry may influence corruption, tax rates, per capita GDP and unemployment within a state. Therefore, I use 1-year lags for each of these variables and the interaction term. Panel-corrected standard errors are also included in the specification following Dreher and Gassebner (2013). Summary statistics are provided in Table 1.

Table 1. Summary statistics.

Variable	Observations	Mean	Sd	Min	Max
Firm entry	700	2.876	0.521	1.55	4.95
Corruption	700	0.0342	0.301	0	2.548
Top marginal corporate income tax rate	700	6.597	2.810	0	12
% Bachelor degree	700	26.675	5.874	−0.012	40.30
Median age	700	37.487	2.605	20.60	44.10
% Male	700	49.074	2.023	33.348	67.21
% White	700	80.869	12.751	25.585	97.093
Population density	700	189.723	256.47	1.111	1215.417
Unemployment rate	700	5.930	2.114	2.267	13.80
Real per capita GDP (in $10,000)	700	47480.53	8803.211	30536	77263
% Homeowner	700	69.443	5.020	52.9	81.3

[1]Data are freely available at http://www.bls.gov/bdm/bdmstate.htm. The birth rate is a percentage of the previous and current quarter's total number of establishments in a state, averaged together.
[2]Data are freely available at http://taxfoundation.org/article/state-corporate-income-tax-rates.
[3]This information is also freely available at https://www.justice.gov/criminal/pin.
[4]See Glaeser and Saks (2006) for further information and discussion of this measure.
[5]Corruption data for Georgia were not available in 2000. Therefore, this value is linearly interpolated.

III. Results and interpretation

The results from the empirical specification are presented in Table 2.

Here columns 1 through 4 do not include any control variables. Columns 1 and 2 list the *corruption* and *CIT* variables individually, column 3 includes both of those variables regressed together, while column 4 incorporates the interaction term between *corruption* and *CIT*. Columns 5 through 8 follow the same format, but include all of the control variables.

Overall, corruption and tax rates are across the board associated with lower firm birth rates. Specifically, a one-unit increase in corruption decreases firm birth rates between −0.102 and −0.737 percentage points per year, while a 1 percentage point increase in the top marginal corporate tax rate indicates a reduction in firm birth rates between −0.0309 and −0.0714 percentage points. Along with being economically significant, these results are all statistically significant as well.

The interaction term in columns 4 and 8 suggest that the negative effects associated with relatively higher tax rates are offset by corruption given the positive sign coefficient. In order to interpret the result, I consider how a one-unit change in corruption influences tax rates at both the minimum and maximum tax rates. Here, at the minimum *CIT* of 0%, a one-unit increase in corruption would decrease firm entry by −0.737 percentage points without any controls (column 4), while at the maximum tax rate of 12%, a one-unit increase in corruption is associated with a 0.3634 percentage point increase in firm entry. Column 8 suggests that a one-unit increase in corruption at the minimum tax rate results in a reduction in firm entry by −0.649 percentage points, while at the maximum tax rate firm entry again increases by 0.3098 percentage points.

There are a number of important implications that emerge from these results. First, the findings from Belitski, Chowdhury, and Desai (2016) are corroborated, suggesting that while both higher levels of corruption and tax rates have a negative effect on firm entry, corruption can mitigate some of the negative and distortionary effects associated with relatively higher tax rates. This may also lend support to the 'grease the wheels' hypothesis, which suggests that although high levels of corruption are associated with lower entrepreneurial and firm growth, in the face of high regulatory and other entry barriers, corruption can provide

Table 2. Fixed effects Ordinary Least Squares result. Dependent variables—firm birth rate.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged corruption	−0.115**		−0.106*	−0.737***	−0.110**		−0.102*	−0.649***
	(0.0553)		(0.0570)	(0.190)	(0.0541)		(0.0548)	(0.173)
Lagged CIT		−0.0413***	−0.0411***	−0.0714***		−0.0312***	−0.0309***	−0.0580***
		(0.00491)	(0.00476)	(0.00968)		(0.00461)	(0.00439)	(0.00855)
Lagged corruption*CIT				0.0917***				0.0799***
				(0.0241)				(0.0218)
% Bachelor degree					−0.00126	0.00129	0.000216	0.000925
					(0.00347)	(0.00323)	(0.00336)	(0.00335)
Median age					−0.0731***	−0.0700***	−0.0689***	−0.0673***
					(0.00909)	(0.00922)	(0.00905)	(0.00903)
% Male					0.0347**	0.0253*	0.0270*	0.0249
					(0.0157)	(0.0153)	(0.0154)	(0.0154)
% White					1.90e-05	0.000715	0.000263	0.000576
					(0.00109)	(0.000935)	(0.00100)	(0.00102)
Population density					0.000239***	0.000308***	0.000314***	0.000307***
					(6.43e-05)	(6.58e-05)	(6.59e-05)	(6.47e-05)
Lagged unemployment rate					−0.0258	−0.0263	−0.0274	−0.0296
					(0.0210)	(0.0206)	(0.0203)	(0.0199)
Lagged real per capita GDP (in $10,000)					−1.33e-06	−2.12e-06	−1.85e-06	−2.37e-06
					(2.13e-06)	(2.13e-06)	(2.09e-06)	(2.13e-06)
% Homeowner					−0.00742**	−0.00616*	−0.00572	−0.00544
					(0.00354)	(0.00352)	(0.00355)	(0.00361)
Constant	2.915***	3.148***	3.183***	3.390***	4.666***	4.999***	4.934***	5.137***
	(0.0584)	(0.0758)	(0.0805)	(0.106)	(1.009)	(1.036)	(1.026)	(1.042)
Observations	700	700	700	700	700	700	700	700
R-squared	0.004	0.050	0.053	0.082	0.155	0.175	0.179	0.199
State fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Year dummies	Y	Y	Y	Y	Y	Y	Y	Y

Notes: Panel-corrected standard errors in parentheses.
***$p<0.01$, **$p<0.05$, *$p<0.1$

opportunities to bribe public officials in order to gain market entry (see Méon and Sekkat (2005) for an overview).

The findings also suggest that even in a highly developed country like the USA, these particular institutional features matter a great deal for firm entry. Further, institutional features such as federalism do not necessarily lead to radically different outcomes when compared to international studies. Such a consideration could provide additional opportunities for future researchers by extending work on corruption, tax policy and firm entry into other countries operating within a federal system of governance, and also to evaluate the impact these institutions have on firms of varying sizes in order to better tease out some of these issues.

IV. Conclusion

This article has added to the literature regarding the effect that corruption and tax policy might have on firm entry rates. The analysis looked specifically at how the interaction between corruption and tax rates might influence firm entry across US states. Overall, while both increased levels of corruption and higher marginal corporate tax rates are associated with a reduction in firm entry rates across states, interacting these two variables suggests that the negative effects of relatively higher tax rates can be offset and mitigated in the presence of corruption. Along with providing additional avenues for future research, this study also suggests several policy implications for state and local governments.

Disclosure statement

No potential conflict of interest was reported by the author.

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