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The effect of rising public debt on entrepreneurship

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Abstract

This paper examines the relationship between public debt and entrepreneurship, measured by new business creation. The analysis is conducted on a large panel of 141 countries over the period 2006–2018 using instrumental variable and system GMM estimation techniques to address endogeneity concerns. Preliminary findings indicate a non-linear (inverted U-shaped) relationship between public debt and entrepreneurial activity, implying that while moderate levels of public debt may be associated with increased new firm creation, higher debt levels significantly weaken entrepreneurship. These findings highlight the importance of maintaining sustainable debt levels to foster a conducive environment for business formation.

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1. Introduction

Public debt in both advanced and developing countries has been continuously rising for several years. While high public debt in response to shocks, such as the 2008-09 financial crisis and the COVID-19 pandemic can be justified as necessary to implement countercyclical fiscal policy measures during specific time periods, a public debt that is growing over time raises questions about its economic consequences. One major concern is whether rising public debt leads to increased government involvement in economic activity in ways that impede favorable regulations from promoting entrepreneurship.

Drawing on a large panel dataset of 141 countries from 2006 to 2018, the study uses instrumental variable (IV) and system GMM techniques to test the hypothesis that high public debt weakens entrepreneurship (new business creation). Potentially, the impact of public debt on entrepreneurship is non-linear in the sense that it becomes relevant only after a certain threshold has been reached. Indeed, preliminary results from the analysis display an inverted U-shaped relationship between public debt and entrepreneurship, thus supporting existence of non-linearity. To put the results in context, a one percent increase in public debt for the median country significantly reduces new business creation by 18.9 percent. If the median country raises its debt level to reach the 75^{th} percentile, a one percent increase in public debt would yield a 29.1 percent decrease in new business formation. Clearly, the magnitude of the harmful effect on entrepreneurship increases as public debt gets larger. This is concerning because the importance of new business startups for the economic development of a country is undisputed (see for example Barr, 2015 and Aghion, 2017).

Public debt can influence entrepreneurial activity through three main channels. The first is when high public debt competes with private firms for loanable funds, which raises interest rates and reduces (crowd out) private credit, squeezing funding for startups (see for example Reinhart et al., 2012). Micro-level evidence from China supports this credit crowding-out channel: Huang et al. (2020) show that higher local public debt crowded out the investment of private firms by tightening their funding constraints, while leaving the investment of state-owned firms unaffected. In addition, rising public debt means higher cost of debt servicing, which crowds out productive public investment expenditure on infrastructure, education, or R&D that is crucial for supporting entrepreneurship. Based on Davidsson (2015) and Bennett (2019), infrastructure provision is a critical "external enabler" or external condition that acts to promote entry of new firms in markets by creating business opportunities and by reducing doing business costs. For example, good transport infrastructure enables opportunities by connecting firms to their customers and suppliers, while access to modern telecommunication services and reliable electricity supply reduces barriers to opportunities for new firm entry into markets, and also improves their productivity.

A second channel is expectations that a government will reduce its debt-burden by imposing policies which raise future taxes or inflation. An anticipated increase in corporate income tax, capital gains tax and other taxes reduces expected after-tax returns, lowering current investment and incentives for entrepreneurial entry. Similarly, an anticipated increase in inflation adversely affects investment and entrepreneurial entry by reducing inflation-adjusted expected returns. The third channel is increased macroeconomic uncertainty associated with debt sustainability concerns, which raises risk premia and interest rates. Public debt-induced higher interest rates in turn raise corporate financing costs, further dampening investment and negatively impacting entry of credit-constrained new firms.

This study and its findings relate to the empirical literature examining the effects of public debt on domestic investment and entrepreneurship. Schclarek (2004) and Kumar and Woo (2010) find evidence in both emerging and advanced economies that an increase in public debt harms private sector investment. Checherita-Westphal and Rother (2012) find that public debt has a negative effect on investment in the euro area countries. More recent studies exploiting subnational variation and policy reforms in China provide additional evidence on the mechanisms linking government debt to private sector activity. Huang et al. (2020) document that local public debt crowds out private investment through tighter funding constraints, and Hu et al. (2025) identify a complementary trade credit channel whereby government deleveraging worsens the financial conditions of private government contractors, reducing their investment and operating performance (a reverse crowding-in effect). Conversely, Li et al. (2026) show that a local government debt-to-bond swap program in China generated crowding-in effects by inducing banks to reallocate credit toward more productive private firms, thereby raising local productivity. Together, these studies indicate that how public debt is structured and governed matters greatly for its effects on private firms. Studies such as these, however, largely concern the intensive margin and do not address the issue of crowding out of new firms since investment by established firms is the major source of total domestic investment. Moreover, conducting separate analysis of the effects of public debt on new firms using the approach in previous literature is difficult due to unavailability of disaggregated data on domestic investment. A notable exception focusing on the extensive margin is Cui et al. (2024), who exploit China's New Budget Law reform and find that government debt governance bolsters entrepreneurial ventures by optimizing land utilization and enhancing access to start-up loans. This paper contributes to these studies by focusing on new business startups in a large cross-country panel, thereby providing evidence on the relationship between public debt and the extensive margin of private sector activity beyond a single-country setting.

Another strand of literature demonstrates that government size (i.e. size of government spending) has a negative association with entrepreneurship. Aidis et al. (2012) find robust evidence of a negative relationship between the size of the government and entrepreneurial entry in 47 different countries, while Islam (2015) also finds that a negative relationship exists between government consumption expenditure and entrepreneurial activity. Parker (2004), observes that high levels of government spending may reduce incentives to engage in entrepreneurial activities by providing alternative sources of income or safety nets. This is confirmed by Koellinger and Minniti (2009), who find that generous unemployment benefits are negatively associated with nascent entrepreneurship in 16 developed countries. This paper complements these studies given that the increase in government debt in most countries is the result of tax revenue not keeping pace with the expansion of government spending.

The rest of this paper is organized as follows. The next section describes the empirical methodology. Estimation results on the relationship between government debt and entrepreneurship are presented and discussed in section 3. A final section concludes.

2. Data and Empirical Strategy

2.1. Entrepreneurship and public debt

The paper employs a concept of entrepreneurship associated with the introduction of new firms, (see for example Bjørnskov and Foss, 2008). Based on this concept, entrepreneurship is measured by new business density. The source of data for new business density is the World

Bank's Entrepreneurship Database Project (doingbusiness.org). Examples of studies that have adopted new business density as the measure of entrepreneurship include Djankov et al. (2010), Klapper and Love (2011), Klapper et al. (2015) and Chambers and Munemo (2019). A major appeal of this measure is that introduction of new firms is associated with innovation activities which are the source of Schumpeterian forces of creative destruction that drive the entrepreneurship process. Another advantage of using this measure is that data on new business density is available for a large sample of developing and developed countries. The data on new business density is however only available for the formal sector. The informal sector, which is an important component of entrepreneurship in some developing countries, is excluded due to the lack of data on the number of firms operating within that sector. Public debt is measured by general government gross debt as a percent of GDP from the IMF's World Economic Outlook Database. This measure is preferred because it is broadly comparable across countries, and this makes it possible to use a large and sufficiently long panel dataset. It is also the preferred measure commonly used by other studies (for example Eberhardt and Presbitero, 2015; Checherita-Westphal and Rother, 2012).

2.2. Control variables

Studies that have employed new business density as the measure of entrepreneurship also control for country level measures of institutional quality, business regulations, access to credit, and the overall economic development of a country (see for example Djankov et al., 2010; Klapper and Love, 2011; Klapper et al., 2015; and Chambers and Munemo, 2019). Data on the quality of institutions were obtained from the World Bank's Worldwide Governance Indicators (WGI) database, which measures the quality of governance (the measure of institutional quality) along six dimensions: voice & accountability, political stability & absence of violence, government effectives, regulatory quality, rule of law and control of corruption. Each of the dimensions is measured on a scale ranging from -2.5 to 2.5, with higher values corresponding to better outcomes. In addition, an overall measure of the quality of institutions is utilized, and it is equal to the simple average of the six governance dimensions from the WGI database. In the previous studies using new business density mentioned above, institutional quality is found to be strongly associated with entrepreneurship.

Turning to the other control variables, the number of start-up procedures to register a business has been widely used in the literature to measure the quality of business regulations. The same measure is used in this study, and the data were collected from the World Bank's Doing Business database (www.doingbusiness.org). Access to credit is important for entrepreneurship because it relaxes the constraints to financial credit facing small and medium enterprises (SMEs), as well as new enterprises (see Beck and Demirguc-Kunt, 2006 and Manova, 2013). Data on domestic credit to the private sector (% GDP) from the World Bank's WDI databank are used to measure access to credit. Other studies including Djankov et al. (2010), Klapper et al. (2010), and Chambers and Munemo (2019) find that more economically developed nations (as measured by real per capita GDP) have more formal sector startup activity. Therefore, in the empirical analysis that follows, the level of real GDP per capita from the WDI database is used as a control variable as well.

Table 1 shows the total number of countries in the sample with annual data on new business density, along with their income levels. Combining all the data resulted in an unbalanced panel dataset of 141 countries, spanning the time period between 2006- 2018. Description of variables and summary statistics of the full sample data are shown in Table 2.

Table 1: Countries in the sample with data on new business density

Country Name	Code	Income Group	Country Name	Code	Income Group
Afghanistan	AFG	Low income	Estonia	EST	High income
Albania	ALB	Upper middle income	Ethiopia	ETH	Low income
Algeria	DZA	Lower middle income	Finland	FIN	High income
Antigua and Barbuda	ATG	High income	France	FRA	High income
Argentina	ARG	Upper middle income	Gabon	GAB	Upper middle income
Armenia	ARM	Upper middle income	Georgia	GEO	Upper middle income
Australia	AUS	High income	Germany	DEU	High income
Austria	AUT	High income	Ghana	GHA	Lower middle income
Azerbaijan	AZE	Upper middle income	Greece	GRC	High income
Bahrain	BHR	High income	Grenada	GRD	Upper middle income
Bangladesh	BGD	Lower middle income	Guatemala	GTM	Upper middle income
Belarus	BLR	Upper middle income	Guinea	GIN	Low income
Belgium	BEL	High income	Haiti	HTI	Low income
Belize	BLZ	Upper middle income	Hong Kong	HKG	High income
Benin	BEN	Lower middle income	Hungary	HUN	High income
Bhutan	BTN	Lower middle income	Iceland	ISL	High income
Bolivia	BOL	Lower middle income	India	IND	Lower middle income
Bosnia and Herzegovina	BIH	Upper middle income	Indonesia	IDN	Upper middle income
Botswana	BWA	Upper middle income	Iran, Islamic Rep.	IRN	Upper middle income
Brazil	BRA	Upper middle income	Iraq	IRQ	Upper middle income
Brunei Darussalam	BRN	High income	Ireland	IRL	High income
Bulgaria	BGR	Upper middle income	Israel	ISR	High income
Burkina Faso	BFA	Low income	Italy	ITA	High income
Cabo Verde	CPV	Lower middle income	Jamaica	JAM	Upper middle income
Cambodia	KHM	Lower middle income	Japan	JPN	High income
Canada	CAN	High income	Jordan	JOR	Upper middle income
Central African Republic	CAF	Low income	Kazakhstan	KAZ	Upper middle income
Chad	TCD	Low income	Kenya	KEN	Lower middle income
Chile	CHL	High income	Kiribati	KIR	Lower middle income
Colombia	COL	Upper middle income	Korea, Rep.	KOR	High income
Comoros	COM	Lower middle income	Kosovo	XKX	Upper middle income
Congo, Dem. Rep.	COD	Low income	Kuwait	KWT	High income
Costa Rica	CRI	Upper middle income	Kyrgyz Republic	KGZ	Lower middle income
Cote d'Ivoire	CIV	Lower middle income	Lao PDR	LAO	Lower middle income
Croatia	HRV	High income	Latvia	LVA	High income
Cyprus	CYP	High income	Lesotho	LSO	Lower middle income
Czech Republic	CZE	High income	Liberia	LBR	Low income
Denmark	DNK	High income	Liechtenstein	LIE	High income
Dominica	DMA	Upper middle income	Lithuania	LTU	High income
Dominican Republic	DOM	Upper middle income	Luxembourg	LUX	High income
El Salvador	SLV	Lower middle income	Madagascar	MDG	Low income

Table 1(Cont.): Countries in the sample with data on new business density

Country Name	Code	Income Group	Country Name	Code	Income Group
Malawi	MWI	Low income	Slovak Republic	SVK	High income
Malaysia	MYS	Upper middle income	Slovenia	SVN	High income
Maldives	MDV	Upper middle income	South Africa	ZAF	Upper middle income
Mali	MLI	Low income	South Sudan	SSD	Low income
Malta	MLT	High income	Spain	ESP	High income
Mauritania	MRT	Lower middle income	Sri Lanka	LKA	Lower middle income
Mauritius	MUS	High income	St. Lucia	LCA	Upper middle income
Mexico	MEX	Upper middle income	St. Vincent	VCT	Upper middle income
Micronesia, Fed. Sts.	FSM	Lower middle income	Suriname	SUR	Upper middle income
Moldova	MDA	Lower middle income	Sweden	SWE	High income
Mongolia	MNG	Lower middle income	Switzerland	CHE	High income
Montenegro	MNE	Upper middle income	Tajikistan	TJK	Low income
Morocco	MAR	Lower middle income	Tanzania	TZA	Lower middle income
Myanmar	MMR	Lower middle income	Thailand	THA	Upper middle income
Namibia	NAM	Upper middle income	Timor-Leste	TLS	Lower middle income
Nepal	NPL	Lower middle income	Togo	TGO	Low income
Netherlands	NLD	High income	Tonga	TON	Upper middle income
New Zealand	NZL	High income	Tunisia	TUN	Lower middle income
Niger	NER	Low income	Turkey	TUR	Upper middle income
Nigeria	NGA	Lower middle income	Uganda	UGA	Low income
North Macedonia	MKD	Upper middle income	Ukraine	UKR	Lower middle income
Norway	NOR	High income	United Arab Emirates	ARE	High income
Oman	OMN	High income	United Kingdom	GBR	High income
Pakistan	PAK	Lower middle income	Uruguay	URY	High income
Panama	PAN	High income	Uzbekistan	UZB	Lower middle income
Paraguay	PRY	Upper middle income	Vanuatu	VUT	Lower middle income
Peru	PER	Upper middle income	Vietnam	VNM	Lower middle income
Philippines	PHL	Lower middle income	Zambia	ZMB	Lower middle income
Poland	POL	High income	Zimbabwe	ZWE	Lower middle income
Portugal	PRT	High income			
Qatar	QAT	High income			
Romania	ROU	High income			
Russian Federation	RUS	Upper middle income			
Rwanda	RWA	Low income			
Samoa	WSM	Upper middle income			
Sao Tome and Principe	STP	Lower middle income			
Saudi Arabia	SAU	High income			
Senegal	SEN	Lower middle income			
Serbia	SRB	Upper middle income			
Seychelles	SYC	High income			
Sierra Leone	SLE	Low income			
Singapore	SGP	High income			

Notes: Definitions of low-, middle-, and high-income countries are from the World Bank.

Table 2: Definitions and summary statistics

Variable	Description	Obs.	Mean	Standard Deviation	Min	Max
New business density	New firm registrations per 1,000 people (ages 15-64).	1630	3.31	4.56	0.01	39.04
Public debt	General government gross debt.	2308	49.63	35.11	0.00	419.40
Entry regulation	Start-up procedures to register a business (number).	2099	7.75	3.27	1.00	21.00
Credit	Domestic credit to private sector (% of GDP).	1977	55.78	45.15	0.51	308.98
Governance	Average of six governance indicators (control of corruption, government effectiveness, political stability, regulatory quality, rule of law, and voice and accountability).	2149	0.06	0.88	-2.13	1.89
Control of corruption	The extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as “capture” of the state by elites and private interests.	2152	0.06	1.00	-1.77	2.47
Government effectiveness	Captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	2151	0.08	0.97	-2.48	2.44
Political stability	Measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism.	2149	-0.02	0.95	-2.83	1.66
Regulatory quality	Captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private-sector development.	2150	0.10	0.94	-2.27	2.26
Rule of law	Captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	2151	0.05	0.97	-1.97	2.10
Voice & accountability	Captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.	2151	0.07	0.92	-2.23	1.74
GDP per capita	GDP per capita, PPP (constant 2017 international $).	2155	19967.33	20515.40	794.43	115415.40

2.3. Empirical model

The government debt-entrepreneurship relationship is empirically examined by estimating a panel data model for the sample of 141 countries in the dataset. Equation 1 below specifies the main panel data model:

$$Log(FirmEntry)_{it} = \beta_1 Log(Debt)_{itl} + \beta_2 [Log(Debt)_{itl}]^2 + \delta' X_{itl} + \alpha_i + \lambda_t + \varepsilon_{it,} \quad (1)$$

where subscripts i and t represent country and time respectively, and subscript l denotes a time lag. The dependent variable ($FirmEntry$) is measured by the natural log of new business density. Public debt ($Debt$) is measured by the natural log of gross government debt as a percent of GDP. A quadratic term, $Debt^2$ is added to the model to capture the non-linear relationship between new business density and public debt. The matrix *X* includes four main variables that have been identified by the literature as good predictors of entrepreneurial activity at the country level. The first is access to credit ($Credit$), as measured by domestic credit to the private sector. A second control variable is the quality of business regulations ($Entry\ regulation$), and it is measured by the number of start-up procedures to register a business. Institutional quality is the third control variable, and it represents the six indicators of the quality of institutions (voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption), and overall institutional quality ($Governance$), which is the mean value of these six measures. The final control variable used is economic development, as measured by per capita real GDP in PPP-adjusted 2017 dollars.

In addition, the estimation strategy also takes into account country fixed effects (α_i) and time fixed effects (λ_t). Country fixed effects are included to control for unobserved time-invariant differences between countries that affect new business formation in each country, while time fixed effects control for unobserved time varying factors that affect new business creation in all countries. The variable ε_{it} is the disturbance term. The potential for endogeneity of the debt variable is mitigated by using its time lags and by using the instrumental variable (IV) techniques. Following Checherita-Westphal and Rother (2012), both two-stage least squares (2-SLS) and GMM estimators are used.

3. Preliminary Findings

3.1. Instrumental variable models

Even though the debt variable is lagged by two periods in all the estimations, it may still be potentially endogenous. Checherita-Westphal and Rother (2012) instrument the debt variable using its time lags, and this paper adopts the same strategy. Table 3 reports the panel regression results, with robust standard errors shown in parentheses. The estimated coefficient on debt is very stable, ranging in value from 0.686 to 0.740, and is universally statistically significant at the 10% level. On the other hand, the coefficient for government debt squared is uniformly negative and statistically significant at the 5% level in the seven model specifications, with coefficient values ranging between -0.202 and -0.238. The results imply that the relationship between government debt and entrepreneurship is indeed non-linear (i.e., an inverted U-shape relationship). To put the results in context, the effect on entrepreneurship evaluated at the median value of public debt is equal to $0.706 + 2(-0.231 \times 42.345) = -18.86$. Thus, a one percent increase in debt significantly reduces new business density by 18.9%. If the median country raises its debt level to reach the 75th percentile, a one percent increase in debt would yield a

29.1% decrease in new business density. Clearly, the magnitude of the negative effect increases as public debt gets larger.

Table 3: Instrumental variables (2SLS) models

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Institutional quality measure:	Governance	Control of Corruption	Government Effectiveness	Political Stability	Regulatory Quality	Rule of Law	Voice & Accountability
Debt	0.706*	0.737*	0.740*	0.694*	0.686*	0.731*	0.703*
	(0.396)	(0.421)	(0.392)	(0.412)	(0.387)	(0.407)	(0.421)
Debt squared	-0.231**	-0.224**	-0.235**	-0.215**	-0.202**	-0.225**	-0.238**
	(0.099)	(0.104)	(0.100)	(0.104)	(0.098)	(0.101)	(0.103)
Credit	0.014***	0.017***	0.014***	0.018***	0.012***	0.016***	0.016***
	(0.004)	(0.005)	(0.004)	(0.005)	(0.004)	(0.005)	(0.005)
Entry regulation	-0.105***	-0.121***	-0.120***	-0.116***	-0.096***	-0.115***	-0.116***
	(0.025)	(0.026)	(0.026)	(0.025)	(0.024)	(0.026)	(0.026)
Institutional quality	0.681***	0.336*	0.607***	0.390***	0.918***	0.519***	0.438***
	(0.186)	(0.185)	(0.182)	(0.140)	(0.170)	(0.175)	(0.118)
GDP per capita	0.001	0.009	-0.000	0.011**	-0.003	0.005	0.014***
	(0.005)	(0.006)	(0.005)	(0.004)	(0.005)	(0.005)	(0.004)
Constant	0.781	0.414	0.839	0.352	0.470	0.545	0.612
	(0.545)	(0.581)	(0.514)	(0.551)	(0.513)	(0.565)	(0.608)
R-squared	0.550	0.496	0.526	0.528	0.571	0.512	0.538
Observations	1,202	1,204	1,204	1,202	1,204	1,204	1,204
No. of countries	141	141	141	141	141	141	141

Notes: Dependent variable is log new business density. Robust standard errors are shown in parentheses. Credit is lagged by three periods, governance by two periods, entry regulation and output per capita by one period. The superscripts ***, **, and * denote 1 percent statistical significance, 5 percent statistical significance, and 10 percent statistical significance respectively.

A key implication from Staiger and Stock (1997) and Stock and Yogo (2005) is that in addition to obtaining significant second-stage results, the first-stage t-statistic of the instrumental variable should be greater than 3 in absolute value for IV inference to be valid. In all the seven model estimations, the coefficient on debt lagged by two periods (the instrument) is statistically significant at the one percent level in the first stage regression, and its t-statistic is greater than 3 in absolute value (results are not reported for brevity, but are available on request).

Turning to the other results, access to credit has a positive and statistically significant effect at the 1% level in all model specifications. Averaging the credit coefficient estimates across all the model specifications, a 1% expansion in access to credit yields a 1.5% increase in new business density. This result is consistent with the prior findings which demonstrate that greater credit provision to firms in the economy stimulates entrepreneurship by relaxing the constraints to finance facing SMEs, especially in developing countries, where SMEs account for a large share of enterprises (see for example Beck and Demirguc-Kunt, 2006). Regardless of model specification, startup regulations have a negative effect on new business density which is universally statistically significant at the one percent level. Averaging the startup regulation coefficient estimates across all seven model specifications, increasing startup procedures by one step is associated with a 11% decline in new business density. The results provide strong evidence that better quality institutions promote entrepreneurship. All the institutional quality

measures have a significant positive association with entrepreneurship. Focusing on the overall average governance measure in column (1), a one standard deviation improvement in institutional quality (0.876) is associated with a 59.66% increase in new business density. Therefore, consistent with Baumol (1990) and Djankov et al. (2010), nations possessing strong, producer-friendly institutions attract and foster entrepreneurship. Finally, the coefficient estimates on real GDP per capita are both positive and statistically significant in columns (4) and (7).

3.2. Dynamic panel data estimation

It is well known that difference GMM suffers from weak instruments. Therefore, the two-step system GMM is performed. However, there is still the problem that application of GMM estimators leads to instrument proliferation, which in the case of system GMM, also weakens the Hansen test of instrument validity. To limit the number of instruments generated in system GMM and avoid bias in the results, the two-step GMM is performed using collapsed instruments, following Roodman (2009), who describes in detail how this technique can be implemented.

For the first differences equation, differenced values of credit, institutional quality measures, startup regulation, and output per capita are used as standard instruments, while collapsed lagged values of new business density, debt and debt-squared are used as GMM-type instruments. In the levels equation, the standard instruments are credit, startup regulation, governance variables, and output per capita. GMM-type instruments are collapsed differenced lagged values of new business density, debt and debt-squared. Results are reported in Table 4.

Table 4: Dynamic panel data estimation, two-step system GMM

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Institutional quality measure:	Governance	Control of Corruption	Government Effectiveness	Political Stability	Regulatory Quality	Rule of Law	Voice & Accountability
New business density lagged	0.558**	0.526**	0.609**	0.563***	0.634**	0.575**	0.391
	(0.259)	(0.231)	(0.291)	(0.201)	(0.269)	(0.230)	(0.271)
Debt	0.546	0.695	0.550	0.463	0.515	0.590	0.569
	(0.364)	(0.470)	(0.413)	(0.318)	(0.353)	(0.373)	(0.385)
Debt squared	-0.083*	-0.106*	-0.088**	-0.085*	-0.084*	-0.100**	-0.089
	(0.048)	(0.063)	(0.044)	(0.046)	(0.044)	(0.050)	(0.060)
Credit	0.003**	0.004**	0.003**	0.005**	0.002**	0.003**	0.006**
	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)
Entry regulation	-0.052*	-0.069**	-0.050	-0.062**	-0.040	-0.058*	-0.096**
	(0.031)	(0.031)	(0.036)	(0.029)	(0.025)	(0.030)	(0.045)
Institutional quality	0.424	0.294*	0.324	0.270**	0.356	0.309	0.310**
	(0.279)	(0.175)	(0.308)	(0.132)	(0.347)	(0.206)	(0.124)
GDP per capita	-0.048	-0.064	-0.045	-0.014	-0.046	-0.037	-0.025
	(0.088)	(0.108)	(0.103)	(0.071)	(0.097)	(0.085)	(0.071)
Observations	1,279	1,279	1,279	1,279	1,279	1,279	1,279
No. of countries	142	142	142	142	142	142	142
Number of instruments	10	10	10	10	10	10	10

Arellano-Bond test for AR (2) in first differences	0.20	-0.01	0.22	0.30	0.35	0.15	-0.02
P value	0.843	0.993	0.827	0.766	0.724	0.878	0.987
Hansen test of overid. restrictions	1.76	3.62	2.28	3.90	2.20	2.45	1.13
P value	0.624	0.305	0.517	0.273	0.532	0.485	0.77

Notes: Dependent variable is log new business density. Corrected standard errors are shown in parentheses. The superscripts ***, **, and * denote 1 percent statistical significance, 5 percent statistical significance, and 10 percent statistical significance respectively.

Similar to previous results, the quadratic relationship with an inverse U-shape remains robust. Implementing the collapsing technique reduces the instrument count from 70 to 10 and the Hansen test (which is robust and not weakened by reducing the instrument count) supports the null hypothesis that the over-identifying restrictions are valid as shown in Table 4.

4. Conclusion

This study finds evidence for a non-linear impact of public debt on entrepreneurship in a panel of 141 countries over the time period between 2006 and 2018. It uncovers a concave (inverted U-shape) relationship between the public debt ratio and new business density. The estimated coefficient for government debt squared is negative and statistically significant, implying that rising public debt, if left unchecked, can greatly reduce entrepreneurship.

A limitation of the study is that new business density only captures formal opportunity-driven firm creation. In reality, many countries experience a mix of necessity-based self-employment (informal entrepreneurship) and opportunity-driven firm creation. Public debt may have asymmetric effects, depending on the type of entrepreneurship. Given its macro-level approach, the study also acknowledges potential limitations from possible measurement errors in cross-country data. Another limitation of the study is that the empirical tests do not fully examine the mechanisms discussed in the introduction and literature review, namely the crowding out of private credit and productive public investment, expectations of higher future taxes or inflation, and increased macroeconomic uncertainty associated with debt sustainability concerns. In particular, it remains unclear whether these mechanisms themselves also exhibit non-linear changes as public debt rises. Directly testing whether the underlying channels display non-linearities, for example by using disaggregated credit data, measures of expected taxation and inflation, or indicators of macroeconomic and policy uncertainty, is an important avenue for future research.

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