Public Debt and Firm Performance: A Love-Hate Relationship?

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Motivations

⇒ An important public policy question.

- Public debt levels are on the rise, and this is part of an upward drift that has been ongoing for more than ten years.
- Climate adaptation, the green transition, and demographic changes will imply additional spending pressures.
- Past shocks have shown that debt can rise rapidly and on a large scale.

⇒ Uncertainty in the empirical literature.

- The mean result is unlikely to represent a causal effect.
- After correcting for a substantial publication bias in favor of negative effects, one cannot reject a zero average effect.
- Theoretical mechanisms remain unproven.

Research question

Does public debt accumulation undermine firm performance in developing economies?

The demand-side mechanism

⇒ Conventional view: in the short run, a debt-financed fiscal expansion may increase the disposable income of households, thereby boosting consumption and overall demand for goods and services.

⇒ Ricardian equivalence: in the long run, rational economic agents may anticipate future tax increases and save more in response to a debt-financed fiscal expansion.

The supply-side mechanism

⇒ Real debt burden: as public debt raises concerns among lenders and increases borrowing costs, public revenues may be absorbed by debt service, thereby reducing the fiscal space available for essential development spending/public goods provision.

⇒ Private investment may be crowded out if fiscal expansions drive up interest rates.

Empirical model

$$Growth_{i,k,j,(t,t-2)} = \alpha + \beta X_{i,k,j,t} + \gamma Y_{j,(t-3,t-5)} + \tau_{k,t} + \mu_j + \epsilon_{i,k,j,t} \quad (1)$$

- $Growth_{i,k,j,(t,t-2)}$ is the average annual growth rate of the sales of firm i, in industry k, and country j.
- $Debt_{j,(t-3,t-5)}$ is the public-debt-to-GDP ratio of country j, lagged one period.
- $\tau_{k,t}$ are industry $\times$ year dummies.
- μ_j are country fixed effects.

$\Rightarrow$ Standard errors are clustered at the country-year level, which corresponds to the level of aggregation of $Debt_{j,(t-3,t-5)}$.

$\Rightarrow$ Sampling probability weights, defined as the inverse of the probability of selection, are applied to correct for the varying selection probabilities across strata.

Firm-level survey data from the World Bank Enterprise Surveys (WBES)

⇒ WBES collect data on firm characteristics and performance, and on a broad range of business environment topics.[a]

⇒ They cover a representative sample of an economy's private sector.

- All formal private sector businesses ($>$ 1% private ownership) with more than five employees.
- All manufacturing businesses, and a subset of services businesses are included.

⇒ The unit of analysis is the establishment—a business entity associated with a physical location and its own set of financial statements.

⇒ The data produced is comparable across time and countries, through a uniform methodology applied globally.

- A standardized questionnaire administered through face-to-face interviews with business owners and senior managers.
- A stratified random sampling strategy where the three strata are size, sector, and sub-national location.
- A specific substitution strategy by cell of stratification to correct for non-response.

[a] World Bank Enterprise Surveys, www.enterprisesurveys.org.

Final dataset

⇒ 79,746 firms, located in 72 developing economies.

⇒ Within each country, the surveys follow a repeated cross-section design.

⇒ Surveys were conducted between 2006 and 2023, yielding variation in the number of firms and countries covered each year.[a]

⇒ We did not consider firms when the responses to questions regarding opinions, perceptions, and numbers, were deemed to be untruthful, arbitrary, or unreliable.

⇒ Surveys for Angola (2006, 2010) and the Democratic Republic of Congo (2006) were excluded, since these two countries experienced violent events and benefited from higher than normal growth rates.

[a] Taking into account the lag structure, the effective coverage period for our analysis spans from 2003 to 2020.

Table 1

Summary statistics.

Variables	N	Mean	S.D.	Min.	Q1	Q2	Q3	Max.
Firm characteristics								
$\text{Growth}_{i,k,j,(t,t-2)}$	79,746	4.833	46.763	-74.045	-14.200	-3.369	9.983	533.472
$\text{Sales}_{i,k,j,(t-2)}$	79,746	7.960	7.161	-7.161	6.274	7.865	9.545	21.937
$\text{State}_{i,k,j,(t)}$	79,746	0.012	0.108	0.000	0.000	0.000	0.000	1.000
$\text{Foreign}_{i,k,j,(t)}$	79,746	0.096	0.295	0.000	0.000	0.000	0.000	1.000
$\text{Export}_{i,k,j,(t)}$	79,746	0.225	0.418	0.000	0.000	0.000	0.000	1.000
$\text{Size}_{i,k,j,(t)}$	79,746	2.545	0.751	1.000	2.000	3.000	3.000	3.000
Firm $\text{age}_{i,k,j,(t)}$	79,746	19.272	14.861	0.000	9.000	16.000	25.000	210.000
Managerial $\text{experience}_{i,k,j,(t)}$	79,746	18.727	11.123	0.000	10.000	17.000	25.000	72.000

$\Rightarrow$ Most firms in the dataset are not only large but also well-rooted and managed by experienced individuals.

$\Rightarrow$ The average annual growth rate of firm sales is 4.83%, but displays substantial variation across firms with values ranging from –74.05% to 533.47%.

Table 1

Summary statistics.

Variables	N	Mean	S.D.	Min.	Q1	Q2	Q3	Max.
Country variables								
$\text{Debt}_{j,(t-3,t-5)}$	79,746	50.205	24.162	0.000	33.956	49.031	69.668	183.315
$\text{GDP growth}_{j,(t-3,t-5)}$	79,746	12.664	6.200	0.906	8.493	11.532	15.739	34.228
$\text{Primary balance}_{j,(t-3,t-5)}$	79,746	-3.536	3.811	-40.553	-5.832	-2.884	-1.267	8.463
$\text{Income}_{j,(t-3,t-5)}$	79,746	6.411	2.404	1.384	4.649	6.133	7.563	12.248
$\text{Inflation}_{j,(t-3,t-5)}$	79,746	7.170	5.357	-0.100	3.772	5.083	10.407	31.884
$\text{Population}_{j,(t-3,t-5)}$	79,746	17.616	1.967	12.144	16.168	17.484	18.680	21.026
$\text{Corruption control}_{j,(t-3,t-5)}$	79,746	-0.539	0.444	-1.482	-0.859	-0.553	-0.286	1.397
$\text{Government effectiveness}_{j,(t-3,t-5)}$	79,746	-0.342	0.493	-1.676	-0.685	-0.321	0.029	1.019
$\text{Rule of law}_{j,(t-3,t-5)}$	79,746	-0.463	0.471	-1.775	-0.788	-0.504	-0.029	1.252
$\text{Regulatory quality}_{j,(t-3,t-5)}$	79,746	-0.300	0.464	-1.517	-0.597	-0.265	-0.051	1.037
$\text{Political stability}_{j,(t-3,t-5)}$	79,746	-0.778	0.746	-2.762	-1.257	-0.855	-0.252	1.171

$\Rightarrow$ $Debt_{j,(t-3,t-5)}$ averages 50.2% of GDP, but varies substantially across countries. Values range from 0% in Timor-Leste (2009, 2015), to 183.3% in Zambia (2007).

Endogeneity concerns

$$Growth_{i,k,j,(t,t-2)} = \alpha + \beta X_{i,k,j,t} + \gamma Y_{j,(t-3,t-5)} + \tau_{k,t} + \mu_j + \epsilon_{i,k,j,t} \quad (1)$$

$\Rightarrow$ Time-invariant heterogeneity at the firm-level.

$\Rightarrow$ Time-varying unobservable heterogeneity, potentially correlated with both firm performance and public debt.

$\Rightarrow$ Reverse causality (biasing the estimated effect downward).

Conventional instrumental variable

$$VE_{j,(t-3,t-5)} = Foreign\ Debt_{j,(t-4,t-6)} \times Exchange\ Rate_{j,(t-3,t-5)} \quad (2)$$

- $Foreign\ Debt_{j,(t-4,t-6)}$ is the average share of public debt issued by country j and denominated in U.S. dollars.
- $Exchange\ Rate_{j,(t-3,t-5)}$ denotes the variation in the bilateral exchange rate (log).

$\Rightarrow$ Developing economies carry substantial dollar-denominated debt and experience significant exchange rate volatility.

$\Rightarrow$ Relevance is supported by the mechanical relationship between $VE_{j,(t-3,t-5)}$ and $Debt_{j,(t-3,t-5)}$.

$\Rightarrow$ But is the exclusion restriction plausible?

- Could valuation effects be correlated with omitted variables that also influence firm performance?
- Could exchange rate fluctuations directly affect firm outcomes (*e.g.*, through trade competitiveness or input costs)?

Heteroscedasticity-based instruments

⇒ We implement the method developed by Lewbel (2012), which allows for identification using heteroskedasticity as a source of exogenous variation.[a]

⇒ The idea is to build internal instruments from the model's own data, based on the assumption that the variance of the error term varies systematically with some observed exogenous variables.

⇒ Key assumptions:

- Error term is heteroskedastic—*i.e.*, its variance depends on firm-level characteristics such as size, age, or export status.
- Exogenous variables used to generate the instruments are uncorrelated with the product of the structural error terms.

⇒ Identification is achieved using the TSLS estimator and a set of instruments:

$$Z_i = (X_i - \bar{X}) \cdot \hat{\epsilon}_i$$

where X includes exogenous firm-level variables and $\hat{\epsilon}_i$ is the residual from the first-stage regression.

[a] We use the `ivreg2h` command in Stata.

Heteroscedasticity-based instruments

⇒ **Assumption 1:** variance of the error term varies systematically with some exogenous firm-level variables.

- Some firms naturally experience more volatile growth than others.
- Ex: younger firms tend to have more erratic growth rates.

⇒ **Assumption 2:** exogenous variables used to build instruments must be uncorrelated with the product of the structural error terms.

- Firm-level variables that explain differences in how volatile firm growth is must not be related to hidden factors that simultaneously affect public debt and firm performance.
- Ex: firm age can't be used if young firms are systematically located in highly indebted countries, implementing specific policies that also affect growth.
- We assume firm-level controls are not proxies for unobserved shocks jointly driving debt and growth.

Table 2

Baseline estimations.

Dep. var.: Growth$_{i,k,j,(t,t-2)}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	OLS								TSLS		
Debt$_{j,(t-3,t-5)}$	-0.119	0.363**	0.340**	0.573***	0.146	0.179*	0.217**	0.185**	0.231**	0.127	0.464**
	(0.090)	(0.145)	(0.141)	(0.124)	(0.091)	(0.095)	(0.098)	(0.091)	(0.099)	(0.304)	(0.149)
First-step results:											
VE$_{j,(t-3,t-5)}$	-	-	-	-	-	-	-	-	-	0.252***	0.125***
	-	-	-	-	-	-	-	-	-	(0.062)	(0.043)
Firm-level controls	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Country-level controls	No	No	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes
Country FE	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes
Ind. x Year FE	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
#	79746	79746	79746	79746	79746	79746	79746	79746	79746	79746	79746
R-squared	0.004	0.065	0.113	0.125	0.077	0.121	0.137	0.158	0.158	0.158	0.161
Kleibergen-Paap LM stat (p-value)	-	-	-	-	-	-	-	-	-	0.013	0.001
Kleibergen-Paap F-stat	-	-	-	-	-	-	-	-	-	16.741	15.291
Stock-Yogo critical value	-	-	-	-	-	-	-	-	-	16.38	11.46

Note: Columns (1) to (8) display OLS estimates. Columns (9) to (11) display TSLS estimates, using heteroskedasticity-based instruments, conventional instruments, and both at the time respectively. Robust standard-errors clustered at the country × year level are shown in parentheses. WBES sampling probability weights are used for estimation. The under-identification stems from the Kleibergen-Paap LM statistic. The weak identification test stems from the Kleibergen-Paap Wald F-statistic. The Stock-Yogo weak identification test critical value at 10%. Constant term not reported in order to save space. ***, ** and * denote significance at 1%, 5% and 10% levels."

⇒ A one percentage point increase in the public-debt-to-GDP ratio is associated with a 0.19 percentage point increase in firm sales growth (OLS).

⇒ The coefficient is slightly higher and reaches 0.23–0.24 percentage points when public debt is instrumented following Lewbel (2012).

Does public debt accumulation benefits more (or less) firms facing particular constraints?

$$Growth_{i,k,j,(t,t-2)} = \alpha + \beta\, Debt_{j,(t-3,t-5)} + \gamma\, Debt_{j,(t-3,t-5)} \times X_{i,k,j,(t)} + \delta\, X_{i,k,j,(t)} + Y_{j,(t-3,t-5)} + \tau_{k,(t)} + \mu_j + \epsilon_{i,k,j,(t)} \quad (2)$$

- where $X_{i,k,j,(t)}$ is a set of binary indicators for binding constraints.

$\Rightarrow$ $X_{i,k,j,(t)} = 1$ when business owners or senior managers report a moderate, major, or very severe obstacle to business operations.

$\Rightarrow$ Subjective assessments may be biased due to strategic answers or perception differences.

$\Rightarrow$ Hard data to construct objective measures, and mitigate the potential biases inherent in subjective perceptions.

$\Rightarrow$ Guiding principle: use of the best available information, while maintaining a concern for objectivity.

Table 4

Impact of public debt for different kinds of firms.

Dep. var.: Growth$_{i,k,j,(t,t-2)}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Var.$_{i,k,j,(t)}$ = 1	Electricity	Telecom-munications	Transport	Informal sector	Courts	Tax rates	Political instability	Corruption	Finance	Education
					OLS					
Debt$_{j,(t-3,t-5)}$	0.243**	0.162*	0.210**	0.224**	0.181*	0.219**	0.194**	0.195**	0.207**	0.202**
	(0.097)	(0.098)	(0.094)	(0.097)	(0.092)	(0.094)	(0.093)	(0.095)	(0.094)	(0.094)
Variable$_{j,(t-3,t-5)}$	5.861**	-2.044	2.364	1.548	-1.835	1.774	-0.425	-0.214	1.294	1.799
	(2.741)	(3.615)	(2.130)	(2.744)	(1.968)	(2.063)	(2.225)	(2.231)	(1.896)	(2.351)
Debt$_{j,(t-3,t-5)}$ x Variable$_{j,(t-3,t-5)}$	-0.104**	0.038	-0.064	-0.077	-0.014	-0.058*	-0.024	-0.024	-0.050	-0.042
	(0.044)	(0.058)	(0.041)	(0.053)	(0.048)	(0.031)	(0.033)	(0.036)	(0.039)	(0.041)
#	79746	79746	79746	79746	79746	79746	79746	79746	79746	79746

Note: Columns (1) to (10) display OLS estimates. All regressions include country- and firm-level control variables, as well as country and industry × year fixed effects. Robust standard-errors clustered at the country × year level are shown in parentheses. WBES sampling probability weights are used for estimation. ***, ** and * denote significance at 1%, 5% and 10% levels."

Table 5

Impact of public debt for different kinds of firms.

Dep. var.: Growth$_{i,k,j,(t,t-2)}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Var.$_{i,k,j,(t)}$ = 1	Electricity	Water	Transport	Telecom-munications	Corruption	Public contracts	Tax admin-istrations	Courts	Credit	High school
					OLS					
Debt$_{j,(t-3,t-5)}$	0.094**	0.143**	0.107**	0.061*	0.193**	0.236**	0.200**	0.210**	0.119*	0.136**
	(0.039)	(0.068)	(0.050)	(0.029)	(0.092)	(0.105)	(0.094)	(0.101)	(0.068)	(0.060)
Variable$_{j,(t-3,t-5)}$	-4.101**	0.023	-4.406*	2.827	-1.609	8.648***	2.146	-6.237**	0.641	6.070*
	(1.952)	(3.695)	(2.239)	(3.307)	(2.963)	(2.933)	(2.452)	(2.613)	(5.935)	(3.340)
Debt$_{j,(t-3,t-5)}$ x Variable$_{j,(t-3,t-5)}$	0.046	0.001	0.100**	0.139**	0.003	-0.143**	0.002	0.086**	0.029	-0.087*
	(0.036)	(0.057)	(0.039)	(0.058)	(0.043)	(0.063)	(0.035)	(0.040)	(0.080)	(0.050)
#	75776	37832	79746	53363	79746	72594	79303	63577	68430	41727

Note: Columns (1) to (10) display OLS estimates. All regressions include country- and firm-level control variables, as well as country and industry × year fixed effects. Robust standard-errors clustered at the country × year level are shown in parentheses. WBES sampling probability weights are used for estimation. ***, ** and * denote significance at 1%, 5% and 10% levels."

Does public debt accumulation benefits more (or less) firms operating in particular industries?

$$Growth_{i,k,j,(t,t-2)} = \alpha + \beta\, X_{i,k,j,(t)} + \delta\, Debt_{j,(t-3,t-5)} \times Intensity_k + \tau_{k,(t)} + \gamma_{j,(t)} + \epsilon_{i,k,j,(t)} \quad (3)$$

- $\gamma_{j,(t)}$, replace country-level control variables from Equation (1).
- $Intensity_k$ is a vector of sector-specific intensities, capturing structural dependence on infrastructures, finance, and institutions.

$\Rightarrow$ To build infrastructure-related intensities:

- We compute, for each industry, the average share of selected inputs in total intermediate consumption over 2000–2014.[a]
- We define binary variables equal to 1 when the corresponding share exceeds the 75th percentile across industries.

[a] We use the U.S. input-output matrix (2000–2014) from the World Input-Output Dataset (WIOD) (Timmer et al. (2015a)).

Does public debt accumulation benefit more (or less) firms operating in particular industries?

⇒ For finance, we rely on the indicator developed by Kroszner et al. (2007), which measures the share of capital expenditures not financed through internal cash flow.

- We define a binary variable equal to one if this share exceeds the 75th percentile across industries.

⇒ For institutions, we build a measure of product complexity.

- We use the Herfindhal index of intermediate input use, based on the U.S. input-output matrix (2000–2014).[a]
- Firms that rely on a diverse and balanced set of inputs are more exposed to institutional quality.
- We multiply the index by –1 so that our institutional intensity measure increases with input diversity and institutional dependence.

[a] The Herfindhal index has been used to proxy for institutional dependence in the literature (Blanchard and Kremer (1997), Cowan and Neut (2007)).

Table 6

Impact of public debt for different kinds of industries.

Dep. var.: Growth$_{i,k,j,(t,t-2)}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intensity$_k$ = 1	Electricity	Water	Transport	Telecomm-unications	Education	Health	Public admin-istrations	External dependence	Institutions
					OLS				
Debt$_{j,(t-3,t-5)}$	0.686***	0.688***	0.706***	0.688***	0.692***	0.690***	0.696***	1.947***	0.687***
	(0.074)	(0.074)	(0.077)	(0.073)	(0.074)	(0.073)	(0.074)	(0.053)	(0.074)
Intensity$_k$	0.093	-2.690	1.584	5.658*	4.418	7.207*	11.158**	5.298	2.523
	(5.631)	(7.071)	(2.365)	(3.175)	(3.274)	(3.721)	(4.766)	(5.386)	(3.125)
Debt$_{j,(t-3,t-5)}$ x Intensity$_k$	-0.044	-0.036	-0.004	-0.087*	-0.054	-0.130**	-0.200***	-0.064	-0.039
	(0.064)	(0.080)	(0.034)	(0.050)	(0.050)	(0.055)	(0.070)	(0.079)	(0.047)
#	79746	79746	79746	79746	79746	79746	79746	40,968	79746

Note: Columns (1) to (10) display OLS estimates. All regressions include country- and firm-level control variables, as well as country and industry × year fixed effects. Robust standard-errors clustered at the country × year level are shown in parentheses. WBES sampling probability weights are used for estimation. ***, ** and * denote significance at 1%, 5% and 10% levels."

⇒ We implement the method developed by Lewbel (2012) to address endogeneity concerns using heteroscedasticity-based instruments.

⇒ We explore whether public debt benefits firms [a] facing particular constraints, and [b] operating in specific industries.

⇒ To identify binding constraints, we combine opinion-based survey questions with objective, hard-data indicators.

⇒ To capture structural dependence on infrastructure, finance, and institutions, we construct exogenous, sector-specific input intensities using the U.S. input-output matrix (2000–2014).

⇒ While limitations remain, this study contributes to the literature by:

- Showing how heteroscedasticity-based instruments offer a credible alternative when conventional IVs fail to convince;
- Investigating the mechanisms through which public debt affects firm growth, answering recent calls for more granular analysis.

Thank you for your time and attention!
(And for your support throughout the year...)

References I

Afonso, A. and Alves, J. (2014). The role of government debt in economic growth. *ISEG-UTL Economics Department Working Paper*, (16).

Afonso, A. and Jalles, J. T. (2013). Growth and productivity: The role of government debt. *International Review of Economics & Finance*, 25:384–407.

Aghion, P., Akcigit, U., Cagé, J., and Kerr, W. R. (2016). Taxation, corruption, and growth. *European Economic Review*, 86:24–51.

Aizenman, J., Kletzer, K., and Pinto, B. (2007). Economic growth with constraints on tax revenues and public debt: implications for fiscal policy and cross-country differences.

Alesina, A., De Broeck, M., Prati, A., and Tabellini, G. (1992). Default risk on government debt in oecd countries. *Economic Policy*, 7(15):427–463.

Arslanalp, S., Eichengreen, B., and Simpson-Bell, C. (2023). Gold as international reserves: A barbarous relic no more? *Journal of International Economics*, 145:103822.

Ash, M., Basu, D., and Dube, A. (2017). Public debt and growth: an assessment of key findings on causality and thresholds. Technical report, Working Paper.

Barro, R. J. (1990). Government spending in a simple model of endogeneous growth. *Journal of Political Economy*, 98(5, Part 2):S103–S125.

References II

Barzin, S., D'Costa, S., and Graham, D. J. (2018). A pseudo–panel approach to estimating dynamic effects of road infrastructure on firm performance in a developing country context. *Regional Science and Urban Economics*, 70:20–34.

Bas, M. and Berthou, A. (2012). The decision to import capital goods in india: firms' financial factors matter. *The World Bank Economic Review*, 26(3):486–513.

Baum, A., Checherita-Westphal, C., and Rother, P. (2013). Debt and growth: New evidence for the euro area. *Journal of International Money and Finance*, 32:809–821.

Baum, C. and Schaffer, M. (2024). Ivreg2h: Stata module to perform instrumental variables estimation using heteroskedasticity-based instruments.

Baum, C. F. and Lewbel, A. (2019). Advice on using heteroskedasticity-based identification. *The Stata Journal*, 19(4):757–767.

Beck, T., Demirgüç-Kunt, A., and Maksimovic, V. (2005). Financial and legal constraints to growth: does firm size matter? *The Journal of Finance*, 60(1):137–177.

Bell, A., Johnston, R., and Jones, K. (2015). Stylised fact or situated messiness? the diverse effects of increasing debt on national economic growth. *Journal of Economic Geography*, 15(2):449–472.

References III

Bentour, E. M. (2021). On the public debt and growth threshold: one size does not necessarily fit all. *Applied Economics*, 53(11):1280–1299.

Berman, N. and Héricourt, J. (2010). Financial factors and the margins of trade: Evidence from cross-country firm-level data. *Journal of Development Economics*, 93(2):206–217.

Blanchard, O. and Kremer, M. (1997). Disorganization. *The Quarterly Journal of Economics*, 112(4):1091–1126.

Calderón, C. and Servén, L. (2010). Infrastructure and economic development in sub-saharan africa. *Journal of African Economies*, 19(suppl_1):i13–i87.

Caner, M., Grennes, T. J., and Köhler-Geib, F. F. N. (2010). Finding the tipping point-when sovereign debt turns bad. *Available at SSRN 1612407*.

Cecchetti, S. G., Mohanty, M. S., and Zampolli, F. (2011). The real effects of debt.

Chauvet, L. and Ehrhart, H. (2018). Aid and growth: evidence from firm-level data. *Journal of Development Economics*, 135:461–477.

Chauvet, L. and Ferry, M. (2021). Taxation, infrastructure, and firm performance in developing countries. *Public Choice*, 187:455–480.

References IV

Checherita-Westphal, C., Hughes Hallett, A., and Rother, P. (2014). Fiscal sustainability using growth-maximizing debt targets. *Applied Economics*, 46(6):638–647.

Checherita-Westphal, C. and Rother, P. (2012). The impact of high government debt on economic growth and its channels: An empirical investigation for the euro area. *European Economic Review*, 56(7):1392–1405.

Chong, A. and Gradstein, M. (2009). Volatility and firm growth. *Journal of Economic Growth*, 14:1–25.

Chudik, A., Mohaddes, K., Pesaran, M. H., and Raissi, M. (2017). Is there a debt-threshold effect on output growth? *Review of Economics and Statistics*, 99(1):135–150.

Cinelli, C., Forney, A., and Pearl, J. (2024). A crash course in good and bad controls. *Sociological Methods & Research*, 53(3):1071–1104.

Cochran, W. G. (1977). Sampling techniques. *Johan Wiley & Sons Inc*.

Cole, M. A., Elliott, R. J., Occhiali, G., and Strobl, E. (2018). Power outages and firm performance in sub-saharan africa. *Journal of Development Economics*, 134:150–159.

References V

Cooray, A., Dzhumashev, R., and Schneider, F. (2017). How does corruption affect public debt? an empirical analysis. *World Development*, 90:115–127.

Cowan, K. and Neut, A. (2007). Intermediate goods, institutions and output per worker. *Documentos de Trabajo (Banco Central de Chile)*, (420):1.

DeLong, J. B., Summers, L. H., Feldstein, M., and Ramey, V. A. (2012). Fiscal policy in a depressed economy [with comments and discussion]. *Brookings Papers on Economic Activity*, pages 233–297.

Di Giovanni, J., Levchenko, A. A., and Mejean, I. (2014). Firms, destinations, and aggregate fluctuations. *Econometrica*, 82(4):1303–1340.

Dollar, D., Hallward-Driemeier, M., and Mengistae, T. (2005). Investment climate and firm performance in developing economies. *Economic Development and Cultural Change*, 54(1):1–31.

Eberhardt, M. (2019). Nonlinearities in the relationship between debt and growth:(no) evidence from over two centuries. *Macroeconomic Dynamics*, 23(4):1563–1585.

Eberhardt, M. and Presbitero, A. F. (2015). Public debt and growth: Heterogeneity and non-linearity. *Journal of International Economics*, 97(1):45–58.

References VI

Égert, B. (2015a). The 90% public debt threshold: the rise and fall of a stylized fact. *Applied Economics*, 47(34-35):3756–3770.

Égert, B. (2015b). Public debt, economic growth and nonlinear effects: Myth or reality? *Journal of Macroeconomics*, 43:226–238.

Eichengreen, B., Hausmann, R., and Panizza, U. (2005). The pain of original sin. *Other people's money: Debt denomination and financial instability in emerging market economies*, pages 13–47.

Elmendorf, D. W. and Mankiw, N. G. (1999). Government debt. *Handbook of Macroeconomics*, 1:1615–1669.

Escolano (2010). *A practical guide to public debt dynamics, fiscal sustainability, and cyclical adjustment of budgetary aggregates*, volume 2. International Monetary Fund Washington, DC.

Fazzari, S. M., Ferri, P., and Variato, A. M. (2020). Demand-led growth and accommodating supply. *Cambridge Journal of Economics*, 44(3):583–605.

Fisman, R. and Svensson, J. (2007). Are corruption and taxation really harmful to growth? firm level evidence. *Journal of Development Economics*, 83(1):63–75.

References VII

Gabaix, X. (2011). The granular origins of aggregate fluctuations. *Econometrica*, 79(3):733–772.

Ghosh, A. R., Kim, J. I., Mendoza, E. G., Ostry, J. D., and Qureshi, M. S. (2013). Fiscal fatigue, fiscal space and debt sustainability in advanced economies. *The Economic Journal*, 123(566):F4–F30.

Goyette, J. (2015). Firms growth, corruption, taxation and financial underdevelopment in developing countries. *Department of Economics University of Sherbrooke*, 3(1):3–8.

Greiner, A. (2012). Debt and growth: Is there a non-monotonic relation?

Harrison, A. E., Lin, J. Y., and Xu, L. C. (2014). Explaining africa's (dis) advantage. *World Development*, 63:59–77.

Hausmann, R. and Panizza, U. (2011). Redemption or abstinence? original sin, currency mismatches and counter cyclical policies in the new millennium. *Journal of Globalization and Development*, 2(1).

Hausmann, R., Panizza, U., and Rigobon, R. (2006). The long-run volatility puzzle of the real exchange rate. *Journal of International Money and Finance*, 25(1):93–124.

References VIII

Heimberger, P. (2023). Do higher public debt levels reduce economic growth? *Journal of Economic Surveys*, 37(4):1061–1089.

Herndon, T., Ash, M., and Pollin, R. (2014). Does high public debt consistently stifle economic growth? a critique of reinhart and rogoff. *Cambridge Journal of Economics*, 38(2):257–279.

Jedwab, R. and Moradi, A. (2016). The permanent effects of transportation revolutions in poor countries: evidence from africa. *Review of Economics and Statistics*, 98(2):268–284.

Kaufmann, D. and Kraay, A. (2008). Governance indicators: where are we, where should we be going? *The World Bank Research Observer*, 23(1):1–30.

Kaufmann, D., Kraay, A., and Mastruzzi, M. (2011). The worldwide governance indicators: Methodology and analytical issues1. *Hague Journal on the Rule of Law*, 3(2):220–246.

Khalil, M. and Strobel, F. (2024). Us trade policy and the us dollar. *Journal of International Economics*, 151:103970.

Kroszner, R. S., Laeven, L., and Klingebiel, D. (2007). Banking crises, financial dependence, and growth. *Journal of Financial Economics*, 84(1):187–228.

References IX

Krugman, P. (1988). Financing vs. forgiving a debt overhang. *Journal of Development Economics*, 29(3):253–268.

Kumar, M. and Woo, J. (2010). Public debt and growth.

Lee, S., Park, H., Seo, M. H., and Shin, Y. (2017). Testing for a debt-threshold effect on output growth. *Fiscal Studies*, 38(4):701–717.

Levchenko, A. A. (2007). Institutional quality and international trade. *The Review of Economic Studies*, 74(3):791–819.

Lewbel, A. (2012). Using heteroscedasticity to identify and estimate mismeasured and endogenous regressor models. *Journal of Business & Economic Statistics*, 30(1):67–80.

Limao, N. and Venables, A. J. (2001). Infrastructure, geographical disadvantage, transport costs, and trade. *The World Bank Economic Review*, 15(3):451–479.

Marmullaku, B., Avdimetaj, K., Haziri, A., et al. (2022). The impact of public debt on private consumption in developing european countries. *Journal Transition Studies Review*, 29(2):3–18.

Mitchener, K. J. and Trebesch, C. (2023). Sovereign debt in the twenty-first century. *Journal of Economic Literature*, 61(2):565–623.

References X

Moreno Badia, M., Arbelaez, J. G., and Xiang, Y. (2023). Debt dynamics in emerging and developing economies: Is r- g a red herring? *Journal of Globalization and Development*, 13(2):269–304.

Moulton, B. R. (1990). An illustration of a pitfall in estimating the effects of aggregate variables on micro units. *The Review of Economics and Statistics*, pages 334–338.

Nichter, S. and Goldmark, L. (2009). Small firm growth in developing countries. *World Development*, 37(9):1453–1464.

Nunn, N. (2007). Relationship-specificity, incomplete contracts, and the pattern of trade. *The Quarterly Journal of Economics*, 122(2):569–600.

Panizza, U. and Presbitero, A. F. (2014). Public debt and economic growth: is there a causal effect? *Journal of Macroeconomics*, 41:21–41.

Pescatori, M. A., Sandri, M. D., and Simon, J. (2014). *Debt and growth: is there a magic threshold?* International Monetary Fund.

Presbitero, A. F. (2009). Debt-relief effectiveness and institution-building. *Development Policy Review*, 27(5):529–559.

References XI

Proaño, C. R., Schoder, C., and Semmler, W. (2014). Financial stress, sovereign debt and economic activity in industrialized countries: Evidence from dynamic threshold regressions. *Journal of International Money and Finance*, 45:17–37.

Rajan, R. and Subramanian, A. (2007). Does aid affect governance. *American Economic Review*, 97(2):322–327.

Rajan, R. and Zingales, L. (1998). Financial development and growth. *American Economic Review*, 88(3):559–586.

Rajan, R. G. and Subramanian, A. (2011). Aid, dutch disease, and manufacturing growth. *Journal of Development Economics*, 94(1):106–118.

Reinhart, C. M. and Rogoff, K. S. (2010). Growth in a time of debt. *American Economic Review*, 100(2):573–578.

Rodrik, D. (2008). The real exchange rate and economic growth. *Brookings Papers on Economic Activity*, 2008(2):365–412.

Rud, J. P. (2012). Electricity provision and industrial development: Evidence from india. *Journal of Development Economics*, 97(2):352–367.

Sachs, J. (1988). Conditionality, debt relief, and the developing country debt crisis.

References XII

Sosvilla, S. and Gómez-Puig, M. (2019). New empirical evidence on the impact of public debt on economic growth in emu countries. *Revista de Economía Mundial*, (51).

Straub, S. (2008). *Infrastructure and growth in developing countries*, volume 4460. World Bank Publications.

Timmer, M. P., Dietzenbacher, E., Los, B., Stehrer, R., and De Vries, G. J. (2015a). An illustrated user guide to the world input–output database: the case of global automotive production. *Review of International Economics*, 23(3):575–605.

Timmer, M. P., Dietzenbacher, E., Los, B., Stehrer, R., and De Vries, G. J. (2015b). An illustrated user guide to the world input–output database: the case of global automotive production. *Review of International Economics*, 23(3):575–605.

Tybout, J. R. (2000). Manufacturing firms in developing countries: How well do they do, and why? *Journal of Economic literature*, 38(1):11–44.

Verhoogen, E. (2023). Firm-level upgrading in developing countries. *Journal of Economic Literature*, 61(4):1410–1464.

Woo, J. and Kumar, M. S. (2015). Public debt and growth. *Economica*, 82(328):705–739.

References XIII

Wright, P. G. (1928). *The tariff on animal and vegetable oils*. Number 26. Macmillan.

Yang, L. and Su, J.-J. (2018). Debt and growth: Is there a constant tipping point? *Journal of International Money and Finance*, 87:133–143.