

# Institutional and Structural Determinants of Investment Worldwide

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# Understanding Cross-Country Variation in Investment Activity

- Cross-country variation in investment activity is substantial
  - For 30-year period between 1980 and 2010, the investment rates worldwide ranged from 6–77%
  - Variance more than two times that of economic growth rates
- Much of this variability stems from developing countries
  - Developing economies also exhibit a far greater diversity in political-economic structure and institutions

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# Extant Focus of Existing Literature on Cross-Country Investment I

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    - Papers that examine cross-country investment patterns in developed economies (Byrne & Davis 2005; Davis 2010; Oliner, Rudebusch & Sichel 1995)
    - Papers that run “horse races” over a well-defined set of theories (Chirinko 1993; Ferderer 1993; Kopcke & Brauman 2001)
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  - ... such as the real exchange rate (Serven 2003), fiscal/monetary policy (Greene & Villanueva 1991), capital inflows (Wai & Wong 1982)

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## Structural and Institutional Factors Are Important

- A small number of papers have studied the role that institutional and structural factors play
  - Impact of financial development (Benhabib & Spiegel 2000; Levine 2005; Love & Zicchino 2006) and structure (Ndikumana 2005)
  - Institutional quality (Campos & Nugent 2003; Mauro 1995; Morrissey & Udomkerdmongkol 2012) and structure (Dawson 1998)
  - Business environment (Bartelsman, Haltiwanger & Scarpetta 2010; Utrero & Gonzalez 2007)

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# Incorporating Structural and Institutional Factors is Precluded by Theory I

- One may object to the wholesale incorporation of structural/institutional measures as atheoretical
  - Only the case when determinants are understood narrowly
  - The user cost of capital (Jorgenson 1963) may differ due to differences in tax structure (Hall & Jorgenson 1967)
  - Adjustment costs in a Tobin's  $Q$  (Tobin 1969) or  $(S, s)$ -type (Caballero & Engel 1999) model may reflect differences in institutional transactions costs
  - Models with capital market frictions (Holstrom & Tirole 1997) or uncertainty (Caballero & Pindyck 1996) also suggest frictions that can arise from differences in institutions and structure

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- Recent work on differences in cross-country investment patterns (Caselli & Feyrer 2007; Hsieh & Klenow 2007; Kraay, Loayza, Serven & Ventura 2005) stress importance of uninsurable idiosyncratic investment risk
  - Such risks reflect structural and institutional distinctions as frictions that prevent returns to capital/investment from normalizing across countries

# An Empirical Investigation of Structural and Institutional Determinants of Investment

- 1 **Central argument:** All structural and institutional determinants of investment should be subject to systematic analysis
  - Empirically identify and estimate relative importance of structural and institutional determinants for cross-country investment in a fully-articulated empirical model
- 2 Extend determinants in standard neoclassical model to include various families of structural and institutional determinants

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# Simple Neoclassical Model of Investment

- Optimal capital stock

$$K_{it}^* = \frac{\alpha Y_{it}}{R_{it}^\sigma},$$

- Capital accumulation equation

$$K_{i,t+1} = (1 - \delta) K_{it} + I_{it}$$

- Investment function

$$\Rightarrow i_t = \beta + y_{it} + g_{it} - \sigma r_{it}$$

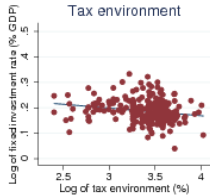
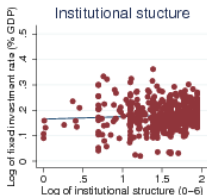
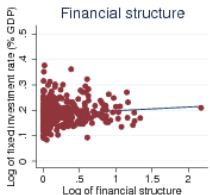
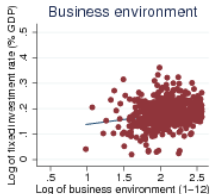
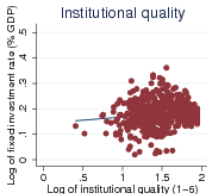
# Empirical Model of Investment with Structural and Institutional Factors

- Econometric specification

$$i_{it} = \beta + \phi i_{i,t-1} + \psi y_{it} + \gamma g_{it} - \sigma r_{it} + \Phi' \mathbf{X}_{it} + \Gamma' \mathbf{Z}_{it} + \epsilon_{it}$$

- Dynamic panel estimation via GMM (Arellano & Bover 1995, Blundell & Bond 1998)
  - Accounts for between and within variation in data (institutional variations may be larger between)
  - Resolves problems from Nickell bias due to the inclusion of the lagged dependent variable (key since investment is sticky)
  - (Weak) control of potential endogeneity

# Bivariate Relationship Between Structural/Institutional Variables





## Baseline Results

	B1	B2	B3	B4	B5	B6	B7	B8
Lagged investment	0.463 (0.18)***	0.608 (0.11)***	0.373 (0.23)	0.466 (0.17)***	0.471 (0.16)***	0.475 (0.18)***	0.359 (0.10)***	0.458 (0.08)***
Output	0.583 (0.21)***	0.393 (0.12)***	0.614 (0.22)***	0.518 (0.19)***	0.509 (0.17)***	0.495 (0.19)***	0.663 (0.12)***	0.536 (0.09)***
Output growth	0.594 (0.24)**	1.071 (0.25)***	1.488 (0.38)***	1.430 (0.26)***	1.395 (0.26)***	1.423 (0.30)***	1.249 (0.23)***	1.241 (0.29)***
Cost of capital	0.419 (1.98)	-0.895 (1.04)	-0.201 (1.08)	1.241 (1.67)	1.168 (1.54)	1.251 (1.49)	0.246 (1.23)	0.662 (1.13)
Trade openness		-0.166 (0.25)	-0.046 (0.27)	-0.079 (0.26)	-0.017 (0.23)	-0.105 (0.23)	0.098 (0.14)	0.028 (0.11)
Financial openness		-0.141 (0.06)**	-0.140 (0.08)*	-0.185 (0.08)**	-0.169 (0.07)**	-0.184 (0.07)**	-0.116 (0.08)	-0.108 (0.05)**
Financial development			0.275 (0.15)*	0.273 (0.13)**	0.270 (0.13)**	0.329 (0.13)***	0.007 (0.07)	0.048 (0.08)
Institutional quality				0.138 (0.08)*	0.140 (0.08)*	0.149 (0.09)*	0.158 (0.09)*	0.159 (0.08)**
Business environment					-0.015 (0.10)	-0.130 (0.18)	-0.123 (0.12)	-0.023 (0.12)
Institutional structure						0.101 (0.08)	0.112 (0.08)	0.053 (0.08)
Tax environment							-0.045 (0.04)	
Financial structure								0.007 (0.10)

# Main Findings

- Institutional quality and financial development usually significant (statistically and economically)
  - Weaker results for institutional quality
- Robustness of benchmark
  - Alternative measures of dependent and independent variables
  - Inclusion of additional covariates (capital stock, financial crises)
  - Endogeneity of financial development and institutional quality
  - Interactions between development and structure
  - Subsamples by average financial development and institutional quality

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- Financial development and institutional quality are reasonably robust determinants of investment
- Institutional quality is more robust to reverse causality and to conditioning on structure
- Financial development (institutional quality) more important in industrialized (nonindustrialized) economies
- **Takeaway:** Institutional and structural determinants matter, but not all are equally important for investment

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