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Institutional and structural determinants of investment worldwide

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ABSTRACT

This paper considers institutional and structural factors associated with investment activity in a panel of up to 129 developed and developing countries. We introduce these factors to a standard neoclassical investment function for open economies, and find that financial development and institutional quality are reasonably robust determinants of cross-country capital formation, with latter displaying more stability in the sign and significance of its coefficient. Indeed, when endogeneity concerns are addressed more explicitly using external instruments, and both interactions and subsamples are considered, institutional quality tends to survive as the causal determinant of investment.

1. Introduction

The cross-country variation in investment activity is truly remarkable. For the 30-year period between 1980 and 2010, the rate of gross fixed capital formation worldwide ranged from 1 to 90 percent of production, a variance more than two times that of economic growth. Much of this variability arises from developing countries, which also exhibit a far greater diversity in terms of political-economic structure and institutions. However, since most empirical studies of aggregate investment tend to focus on a relatively small set of (mostly) developed countries (Byrne and Davis, 2005; Davis, 2010; Oliner et al., 1995) and a well-defined set of theories (Chirinko, 1993; Ferderer, 1993; Kopcke and Brauman, 2001), they gloss over such structural and institutional detail, since the environments faced in those instances are reasonably similar. This is not the case when attempting to explain a broader cross-section of countries, which can differ along economic, legal, and political dimensions. Consequently, the failure to take into account structural differences that exist in the cross-country data risks missing an important part of the explanation for variations in international investment patterns.

Among the existing literature where a more general mix of economies is considered, the tendency has been a focus on purely economic factors of a more cyclical nature, such as the real exchange rate (Servén, 2003), fiscal and monetary policy (Greene and Villanueva, 1991), or capital inflows (Wai and Wong, 1982). The main shortcoming of such approaches is that they may fail to capture important discontinuities that may arise from longer-run changes in structural factors. A small number of papers do systematically examine the important role that institutional and structural factors play; however, most

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content themselves with the introduction of one or two such variables, such as the level of financial development (Benhabib and Spiegel, 2000; Levine, 2005; Love and Zicchino, 2006) and structure (Ndikumana, 2005), institutional quality (Campos and Nugent, 2003; Mauro, 1995; Morrissey and Udomkerdmongkol, 2012) and structure (Dawson, 1998), and the business environment (Bartelsman et al., 2010; Utrero-González, 2007). When addressed in isolation, however, it is difficult to place the importance of different structural variables in context.

Although there may be objection to the wholesale incorporation of such structural and institutional measures as atheoretical, this is only the case when such determinants are understood narrowly. Many structural determinants are in fact implied by pure investment theory. For example, the user cost of capital in a standard neoclassical model (Jorgenson, 1963) may differ by country due to differences in tax structure (Hall and Jorgenson, 1967). Alternatively, adjustment costs in either a Tobin's Q (Tobin, 1969; Hayashi, 1982) or (S,s)-type (Caballero and Engel, 1999) setting may diverge between countries due to differences in the transactions costs related to the respective institutional frameworks.

Modern theoretical models that incorporate frictions that arise from capital market imperfections (Holmström and Tirole, 1997) or uncertainty (Caballero and Pindyck, 1996; Lucas and Prescott, 1971) also implicitly point to the need to account for structural and institutional factors, since such frictions suggest that, *inter alia*, a country's financial structures and sophistication, or political-institutional risks, may in fact matter for investment. More generally, the (at least partial) irreversibility of investment means that price (interest rate) signals alone may be insufficient to generate observed levels of investment activity (Dixit and Pindyck, 1994), implying a need to pay greater attention to structural-institutional detail.

Recent work that has sought to explain differences in cross-country investment patterns (Caselli and Feyrer, 2007; Hsieh and Klenow, 2007; Kraay et al., 2005)—all of which stress the importance of uninsurable idiosyncratic investment risk—also support the notion that structural and institutional distinctions may be key frictions that prevent returns to capital—and hence investment—from normalizing across countries. Our results suggest that such distortions to the marginal product of capital may in fact derive, at least in part, from an economy's economic structure or its institutions.

Finally, the vast body of work examines the puzzle of high saving retention coefficients (Feldstein and Horioka, 1980) in cross-country analyses of investment point, at least implicitly, to the need to account for endogeneity due to omitted variables, of which structural factors are key. While there have been subsequent theoretical (Kraay and Ventura, 2000; Bai and Zhang, 2010) and empirical (Byrne et al., 2009; Kam Hon, 2012) attempts to either reconcile or reject the notion that a high correlation between investment and saving necessarily implies home bias in investment activity, the underlying misspecification concern underscored by this strand of literature strongly suggests that institutional and structural variation between countries should be properly accounted for in cross-country studies of capital formation.

In this paper, we seek to empirically identify and estimate the relative importance of the structural and institutional determinants that may be associated with cross-country patterns of aggregate investment. Using a standard neoclassical model as our theoretical launching point, we systematically introduce various families of structural and institutional determinants. Our estimation methodology relies on dynamic panel estimation via GMM (Arellano and Bover, 1995; Blundell and Bond, 1998), which allows us to capture potential partial adjustment effects, as well as some (weak) control of possible endogeneity, at the expense of somewhat less precise estimates (Attanasio et al., 2000). Our main contribution is thus the simultaneous evaluation of a host of institutional and structural variables, with the goal of identifying key determinants of investment worldwide.

We obtain two key findings. First, across a range of specifications and alternative measures, financial development and institutional quality are reasonably robust determinants of investment. While the former typically enters with a larger magnitude vis-á-vis the latter, institutional quality displays both a more stable coefficient and consistent statistical significance. Second, and related to the first, when potential endogeneity concerns are addressed more explicitly using external instruments, financial development drops out of statistical significance entirely, suggesting that—to the extent that the external instruments are reliable—institutional quality is less likely to be contaminated by reverse causality concerns, at least insofar as investment activity is concerned.

The rest of the paper is organized as follows. The following section outlines the main data sources and definitions (Section 2.1), along with our empirical methodology (Section 2.2). Section 3 discusses both the benchmark results as well as the robustness of these results to alternative specifications and measurements (Section 3.3) and more stringent endogeneity testing (Section 3.4). The section also attempts to tease out the manner by which interaction effects (Section 3.5) and subsamples (Section 3.6) be driving the key findings. A final section concludes with some reflections on policy implications.

2. Data and methodology

2.1. Data sources and definitions

The dataset for the investment regressions is an unbalanced country-level panel, covering up to 129 economies[1] over 5-year periods[2] between 1980–2009. Variables for the benchmark regressions were sourced from the World Bank's World

[1] In the preferred benchmark specifications, however, the sample coverage is 105 economies. These are listed in Appendix Table A.2.

[2] We use 5-year averages to smooth out business cycle considerations, and to better accord with the data requirements of our estimator (system GMM), which calls for a relatively short T panel. Nevertheless, we report results using bias-corrected least squares dummy variable (LSDV) estimates in the annex (the qualitative findings are unchanged using annual data).