Institutional Determinants of Domestic Investment: A GMM Panel Data Analysis

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Introduction

Investment is a significant component of the aggregate demand that plays a vital role in the growth of output, employment, and productivity in the long-run. Over recent decades, the cross country variations in investment have been remarkable. As noted in Lim (2014), between 1980 and 2010, the variability in the rate of gross fixed capital formation ranged between 1 to 90 percent of GDP worldwide, the greater part of which has come from the developing countries that also exhibit higher diversity in terms of their institutional structures.

The conventional belief is that the accumulation of investment funds, labor growth, and productivity rise explain the growth rate of economies. The role of a sound institutional environment as an essential pre-condition to providing a healthy climate for factor accumulation and productivity growth is mostly neglected in the neoclassical theories of economic growth. However, recently, a big strand of literature emerged that has broadly acknowledged the importance of institutions for technological progress and innovation, FDI, financial development and more extensively for economic growth. A dynamic analysis of the impact of institutional quality for factor accumulation is far less discussed in the literature that demands further investigations.

Objectives

The objective of this paper is to test the impact of institutional quality on domestic investment using the three indices of institutions that we have constructed for the purpose of this study.

Methodology

This study used panel dataset of 92 countries (47 high-income and 45 middle-income) for the period 1995-2017. The primary sources of the data are World Economic Outlook, IMF, World Development Indicators of the World Bank, and the Fraser institute's economic freedom database. Real GDP per capita, gross domestic saving, gross capital formation, domestic credit provided to the private sector, and interest rate data are derived from the World development indicators (WDI) database. We have used gross capital formation as a proxy domestic investment, and domestic credit provided to the financial sector is used as a proxy for the level of financial development. Average consumer price from World Economic Outlook (WEO) is used as a proxy for inflation, and for the construction of institutional indices, the data for the selected variables are derived from Fraser institute's database of the economic freedom of the world.

In this paper, we use the Arellano-Bover (1995) system GMM to estimate an augmented version of the MRW (1992) model (equation 1). The generaied method of moment (GMM) has grown in popularity among researchers due to its characteristic of correcting the problems of endogeneity, omitted variable bias, measurement error, and unobserved country heterogeneity in econometric studies (Bond et al., 2001). We have followed Roodman (2009) to choose the number of lags, and we have paid close attention to keeping the number of the instrument below the number of cross sections. As suggested by Arellano and Bover (1995), we have used the forward orthogonal deviation transformation method to remove the unobserved individual effect.

$$\mathrm{I_{it}} = \alpha_0 + \alpha_1 \mathrm{Y_{it}} + \alpha_2 \mathrm{I_{i,t-1}} + \alpha_3 \mathrm{INS_{it}} + \alpha_4 \mathrm{Z_{it}} + \alpha_5 \delta \mathrm{C} + \varepsilon_{\mathrm{it}} \qquad (1)$$

$$\varepsilon_{\mathrm{it}} = \mu_{\mathrm{i}} + \vartheta_{\mathrm{it}} \sim i.i.d\ (0, \sigma_i^2)$$

Where, I_{it} and Y_{it} are investment and output respectively, $I_{i,t-1}$ is the one period lag of investment – we have used the transformed initial value of I as an instrument for the predetermined variable. C is the user cost of capital proxied with the rate of interest, INS_{it} is the institutional quality variable, Z_{it} a set of controls, and ε_{it} is the error term consists of two-component, a country-specific component μ_i, and an idiosyncratic component ϑ_{it}. Controls here include variables such as domestic saving, inflation, and total credit to the private sector.

Results and Discussion

Table 1 and Table 2 show the empirical results for the impact of institutional quality on investment for the middle-income and high-income countries, respectively. The dependent variable is domestic investment. The independent and control variables include our measures of institutional quality, output, cost of capital, gross domestic savings, inflation, and domestic credit provided to the private sector. All explanatory variables except inflation are with expected signs and statistically significant at the standard significance levels.

Table 1: Results of Investment Regression for Middle Income Countries

	Two-step system GMM			One-step system GMM		
Variables	gcf	gcf	gcf	gcf	gcf	gcf
gcf_1	0.547***	0.572***	0.527***	0.583***	0.590***	0.576***
	(0.021)	(0.026)	(0.026)	(0.051)	(0.051)	(0.052)
ln_rgdppc	0.161***	0.097	0.074	0.175***	0.097*	0.091*
	(0.039)	(0.049)	(0.045)	(0.036)	(0.049)	(0.037)
r	-0.094***	-0.103**	-0.091***	-0.088***	-0.080***	-0.078***
	(0.017)	(0.028)	(0.022)	(0.020)	(0.020)	(0.020)
gds	0.121***	0.144***	0.135***	0.114***	0.13***	0.125***
	(0.017)	(0.019)	(0.018)	(0.015)	(0.019)	(0.016)
cpi	0.268***	0.307***	0.299***	0.265***	0.287***	0.272***
	(0.041)	(0.040)	(0.041)	(0.052)	(0.055)	(0.053)
cre_to	1.677***	0.583***	1.762***	1.900***	0.884***	0.858***
	(0.090)	(0.042)	(0.089)	(0.093)	0.072)	(0.095)
lspr	0.176***			0.137***		
	(0.028)			(0.029)		
regu		0.198***			0.182***	
		(0.051)			(0.049)	
comp_inst			0.139***			0.111***
			(0.023)			(0.021)
# of Obs.	505	505	505	505	505	505
# of Groups	39	39	39	39	39	39
No. of Inst	31	31	31	31	31	31
AR2 (p-value)	0.972	0.909	0.952	0.958	0.908	0.953
Hansen (p-value)	0.227	0.155	0.197			

Note: Standard errors in parentheses. *, ** and **** represent variables are stationary at 10%, 5% and 1% level of significance respectively.

The coefficients of the institutional proxies show that institutional quality has a large and significant impact on domestic investment. In the case of the middle-income countries, one percentage point increase in institutional quality measured by the quality of the legal system and property rights, and the quality of regulations increases the domestic investment as a percentage of GDP by 17.6 percent and 19.8 percent, respectively. However, for high-income countries, although the effect of institutions on investment is significant, the magnitude of the impact is much lower. One percentage point of increase in the quality of legal system-property rights and regulatory quality in an average high-income countries leads to a 4.7% and 7% increase in domestic investment as a percentage of GDP, respectively.

Table 2: Results of Investment Regression for High Income Countries

Variables	Two-step system GMM			One-step system GMM		
	gcf	gcf	gcf	gcf	gcf	gcf
gcf_1	0.694***	0.725***	0.698***	0.708***	0.718***	0.714***
	(0.025)	(0.028)	(0.031)	(0.048)	(0.047)	(0.047)
ln_rgdppc	0.142***	0.109***	0.137***	0.160***	0.109*	0.148**
	(0.026)	(0.020)	(0.020)	(0.039)	(0.044)	(0.045)
r	-0.304***	-0.308***	-0.303***	-0.274***	-0.283***	-0.280***
	(0.026)	(0.026)	(0.026)	(0.057)	(0.058)	(0.057)
gds	0.039**	0.037**	0.037**	0.033*	0.031*	0.032*
	(0.010)	(0.010)	(0.011)	(0.013)	(0.012)	(0.013)
cpi	0.594***	0.587***	0.600***	0.569***	0.575***	0.577***
	(0.041)	(0.038)	(0.042)	(0.101)	(0.103)	(0.102)
cre_to	0.082***	0.079***	0.081***	0.077***	0.080***	0.077***
	(0.005)	(0.006)	(0.006)	(0.014)	(0.014)	(0.014)
lspr	0.045**			0.029*		
	(0.045)			(0.018)		
regu		0.070***			0.082*	
		(0.017)			(0.037)	
comp_inst			0.027*			0.020
			(0.011)			(0.014)
#. of Obs.	526	526	526	526	526	526
# of Groups	41	41	41	41	41	41
# of Inst.	31	31	31	31	31	31
AR2 (p-value)	0.865	0.883	0.861	0.802	0.824	0.782
Hansen (p-value)	0.100	0.080	0.181			

Note: Standard errors in parentheses. *, ** and **** represent variables are stationary at 10%, 5% and 1% level of significance respectively.

Conclusion

In this paper, we have looked at the impact of institutions on investment using a panel dataset of 92 countries for the period 1995 to 2017. The analysis suggests that the quality of institutions play a vital role in domestic investment in both high-income and middle-income countries. However, we have found a stronger effect of institutions for investment in the case of middle-income countries. Between the two measures of institutions, the index of the quality of regulation is found with relatively higher importance for domestic investment generation. These findings show that the regulatory efficiency, well-defined and enforceable property rights, and the quality judicial system strongly stimulate investment and drive capital resources towards the most productive employments.

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