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Does Economic Resilience Enhance Private Investment? Evidence from Panel Data

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The paper examines the relationship between economic resilience and private investment using panel data from 42 countries. An Index of resilience has been constructed that is comparable both across countries and over time. Both static and dynamic panel model of investments are estimated. The results show that economic resilience has strong impact on private investment. The relationship is robust to alternative estimation methods. Control variables such as growth of per capita income, public investment, FDI, per capita income are also found to be important in determining private investment.

Keywords: Private investment, economic resilience, panel data, GMM estimation

JEL Classification: E2, E3

1. Introduction

While traditional macroeconomic theory used draw a tacit demarcation between theory of economic fluctuation and economic growth, Ramey and Ramey (1995) documented that fluctuations have a profound negative relations with growth. Economic fluctuation is related to economic resilience that refers to a nation's ability to absorb or counteract exogenous shocks without deviating greatly from its predicted output growth trend. It seems quite natural that a more resilient economy will experience lower fluctuation and consequently it will experience higher growth. Recent global financial crisis and economic meltdown and the recovery process clearly exhibited that the economy around the world are not affected in same extent. Moreover, recovery pace also has been quite asymmetric around the world. While part of this difference is due to differences in the appropriateness of the policies, part of the fact lies on the differences in resilience of the economy. Because of the importance of economic resilience, some attention has been given by the academes and researcher to study this aspect more formally. Bulk of economic resilience studies are concerned with either index construction (Briguglio et al., 2006; Rojas-Suarez, 2015 etc) or measuring the impact of resilience on output growth (Ramey and Ramey, 1995; Duval and Vogel, 2008; Hill et al., 2011). Although investment is the key for economic growth, there had been no general study to examine the relationship between economic resilience and investment.

Importance of investment in stimulating growth is well documented in both theories and empirical analysis of economic growth. Investors in private sector always factors in risk factors associated with investment as it is a long run economic decision. If an economy

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is quite vulnerable to shocks, long term investment becomes risky that may discourage investment. Private investors definitely prefer a more vibrant and resilience economic condition while taking long term investment decision. Thus, it is quite obvious that economic resilience may have positive impact on private investment. Actually, the negative relation between fluctuation and growth implies that fluctuation may be associated with lower investment. Thus, it is quite imperative to study the relationship between resilience in private investment. However, existing studies on private investment do not explore the issued. Although there is a country study linking resilience and sectoral investment (Hasan and Othman, 2015), there is no cross country analysis linking economic resilience and private investment. The present paper intends to fill up this gap by conducting a more general study on the relationship between economic resilience and private investment. First it constructs a resilience index that is comparable both across countries and over time. The study then builds up an economic model of private investment based on flexible accelerator model and examines the relationship between resilience and private investment with more relevant econometric method covering a large panel of data. Both static and dynamic panel model of investment have been estimated. Main finding of the paper is that economic resilience has a strong positive impact on private investment. The findings have implication for importance of economic resilience in stimulating growth. Structure of the paper of is as follows: Section 2 makes an overview of theory and empirical evidence determining investment focusing private investment. Section 3 describes the model, econometric methodology and data including construction of resilience index. Section 4 analyzes the results. Section 5 concludes the paper.

2. Determinants of Private Investment: A literature Review

There had been a large number of studies regarding determinants of overall investment as well as private investment that documents a long list of determinants of private investment. While, some are grounded on theories, some others are based on obvious economic argument. Studies bring in several factors as important determinants of investment. We attempt make a brief review of the findings, but we will focus only more recent studies. A number of authors were able to empirically show that growth in broad money (M2) positively influences private investment (Godwin, 2010; Alexander, 2011; Olweny, 2012). That is, an increase in broad money supply may lower interest rates and encourage both borrowing and private investments. However, Khan (2010) believes that this mechanism may not hold in financially underdeveloped economies where investment shows little responsiveness to interest. While many studies support this insignificant relationship of interest rate with investment (for example Dore, Makken & Eastman, 2013), some even claim a positive relationship (Becarini, 2007) between them.

Motivated by the accelerator model that asserts that GDP growth should have positive impact on investment, many earlier empirical studies examines the relationship between per capita income growth and investment and assert that private investment is a positive function of per capita income growth. However, more recent studies mostly finds a bi-directional causality between investment and growth in per capita income (Omri and Kahouli 2014 is an example). Textbook macroeconomics asserts crowding

out effect of public investment on private investment. Earlier empirical studies illustrate a negative association between public and private investment due to crowding-out and competition for scarce financial resources. However, a number of studies also find private investment to be an increasing function of public investment. This counter-intuitive finding may be explained by government spending on infrastructural projects. Construction of new roads, bridges, ports, export processing zones, communication equipment etc. may in fact foster private investment and entrepreneurship. Actual relationship may depend on the relative strength of crowding out and crowding in effects. Bahal et al. (2015) examine the issue in the context of India by using structural vector error correction model and find that while public-capital accumulation crowds out private investment in India over 1950-2012, the opposite is true when they restrict the sample post 1980 or conduct a quarterly analysis since 1996Q2. This change can most likely be attributed to the policy reforms which started during early 1980s and gained momentum after the 1991. Recent studies also go into decomposition of public investment to examine the crowding out versus crowding in issues. For example, Xu and Yan (2014) conducts a vector auto regression analysis with the data of China and finds that government investment in public goods crowds in private investment where as government investment in private goods crowds out private investment.

The impact of foreign direct investment (FDI) upon private investments is somewhat ambiguous. While FDI may cause crowding-out as domestic firms may be unable to compete with technologically-superior foreign rivals, it may also have a complementary or crowding-in effect domestic private investment through forward/backward linkages, efficiency enhancing inputs, knowledge spillovers etc. Al-Sadig (2013) finds that FDI stimulates private domestic investment of the developing countries, Positive effects of FDI on private investment in low income countries depend on the availability of human capital. On the other hand, Morrissey & Udomkerdmongkol (2012) finds the evidence of crowding out in the developing countries, and the extent of crowding out is related to governance.

A few studies examined effect of instability on investment. If we go deeper, a legitimate issue that emerges is that through which channel instability affects growth. Does more stable or resilient economy enhance growth through enhancing investment? Hassan & Othman (2015) examined the effect of economic resilience on private investment in different sectors of Malaysia. However, there is no cross country study relating economic resilience and private investment.

The present paper intends to fill out this gap. The research question of the paper is whether economic resilience enhances private investment. Our hypothesis is it does. We construct a broader measure of economic resilience and examine the issue by estimating a theoretical consistent reduced form model of determinants of private investment. Most of the studies on determinants of private investment are country studies. There are very few studies that examined the issue with cross country data. We examine the issue using cross country panel data and estimate both static and dynamic panel model.

3. The Model, Methodology and Data

3.1 Theoretical Model

This study utilizes the flexible accelerator model of investment. This model is one of the most widely cited investment theories and is quite appropriate in studies characterized by data availability issues or other constraints. According to the flexible accelerator model, firms seeking to produce a certain amount of output, must adjust their capital stock over time towards some desired or optimum level (given a particular production technology and interest rate). Furthermore, investment is proportional to the gap between desired and actual capital stocks. Firms would thus invest heavily if their desired capital stock was much greater than their actual capital stock. Their investment function may be represented as:

$$I = \delta\ (K^* - K)$$

Where I is Investment, K^* is the Desired Capital Stock, K is the Actual Capital Stock and δ is the Partial Adjustment Coefficient.

According to Blejer and Khan (1984), macroeconomic variables may be able to influence investment in the flexible accelerator model via the partial adjustment coefficient. The influence of macroeconomic variables may be represented by the equation below:

$$\delta = \beta_0 \frac{1}{I^* - I_{t-1}} \left(\sum \beta_i X_i \right)$$

Where I^* is Desired Investment, I_{t-1} is Investment in the Previous Period, X_i are Macroeconomic Variables and δ is the Partial Adjustment Coefficient. We conjecture that both the target investment I* and that speed of adjustment depend on economic resilience. Investors' decision of course depends on the capacity of the economy to absorb shocks, more resilient economy will attract more private investment. Second, in a resilient economy capacity to adjustment will be also higher affecting the speed of adjustment. Based on the literature, we include the other control variables that affect either the desired capital stock or the speed of adjustment. These are, growth of per capita income, level of per capita income, real interest rate, and depth of financial sector measured by ratio of broad money to GDP, public investment, foreign direct investment and private credit. Thus our economic model of private investment is

$$Private_{,it} = f(resilience_{it}, real_{it}, fdiinflow_{it}, gnigrowth_{it}, credit_{it}, publicinv_{it}, m2gdp_{it}, Gni\text{-}pc_{it})$$

Where $m2gdp_{it}$ is broad money to GDP ratio, $real_{it}$ is the Real Interest Rate, $fdiinflow_{it}$ is FDI Inflows, $gnigrowth_{it}$ is per capita income growth, $credit_{it}$ is credit to the private sector as % of GDP, $publicinv_{it}$ is public Investment, $resindex_{it}$ is economic resilience and $Gni\text{-}pc_{it}$ is per capita income (at constant PPP prices) of country I at time t.

3.2 Construction of Economic Resilience Index

The Economic Resilience Index is constructed by the approach developed by Briguglio et al. (2006). We just made it comparable over both across countries and over time. Four aspects are considered to construct the resilience index: macroeconomic stability, microeconomic efficiency, good governance and social development. Sub indices for each of this aspect are constructed using relevant variables which are then averaged to get overall resilience index. Indices are measured in the scale of 0 to 10.

First each of the variable used to construct a sub index are standardized to make them comparable with one another. Standardized value (SV) is constructed by scaling each of the variables using the following formula:

$$\frac{Vit - Vmin}{Vmax - Vmin} X10$$

Where Vi are the value of a particular variable, V_{max} is the maximum value of it over the entire panel and Vmin is the minimum value. This standardized value is used as the scaled value which is the basis for index construction. However for the variables that has negative impact on resilience, (10 – SV) is used as the scaled value that would be used as the basis for index construction. The scaled value of each of the relevant variables are then averaged to form four sub-indexes; $macrostab_{it}$, $microeff_{it}$, $goodgov_{it}$, $socdev_{it}$. Finally, these sub-indexes were averaged to form the overall $resindex_{it.}$ The list of variables included in construction of each of the sub indices is described below:

3.2.1 Macroeconomic Stability

The macroeconomic stability sub-index relies upon 4 variables: fiscal surplus (or deficit) as % of GDP, some of inflation and unemployment rates, and net ODA as a% of GDP. Economies with a higher budget surplus may be in a better position to enact discretionary fiscal or monetary policies in order to counter sudden exogenous shocks. On the other hand, an economy with a large budget deficit is likely to be much less resilient. An economy with low levels of inflation or unemployment is less likely to be adversely affected by exogenous shocks. However, exogenous shocks may severely exacerbate conditions in nations already plagued by joblessness and price instability. ODA is a form or external debt; a low interest, purpose-specific loan which must be repaid by the developing country. Economies with high Net ODA relative to GNI are likely to be less resilient as they are constrained by loan repayment obligations. Data for all four variables are taken from World Development Indicators of World Bank.

3.2.2 Microeconomic Efficiency

The Microeconomic efficiency sub-index relies upon 2 indicators: government size and freedom to trade (collected from Economic Freedom of the World Index or EFW). High levels of government investment can crowd-out private sector activity and lower the adjustment capacity of freely operating markets. The indicator 'Government Size' was developed by the Economic Freedom of the World Index and relies upon variables such as Government Consumption, Transfers and Subsidies, Government Enterprises and

Investment and Top Marginal Tax Rate. Each variable was standardized to a 0 to 10 rating scale and then averaged to form 'Government Size'. Thus, economies with high levels of govt. consumption, investment, subsidies etc. will have a 'Government Size' rating closer to 0. On the other hand, more free-market oriented economies will be assigned a 'Government Size' rating closer to 10.

Economies with highly protectionist regimes are likely to have lower economic resilience than ones which promote free trade. The indicator 'Freedom to Trade' was developed by the Economic Freedom of the World Index and relies upon variables such as Tariffs, Regulatory Trade Barriers, Black Market Exchange Rates, and Controls on the Movement of People and Capital. Each variable was standardized to a 0 to 10 rating scale and then averaged to form 'Freedom to Trade'. Thus

3.2.3 Good Governance

The Good Governance sub-index relies upon only 1 indicator (collected from Economic Freedom of the World Index or EFW). Economies with stable and just political authority are more likely to be resilient in the face adverse economic conditions. That is, the better the state of governance, the higher will be economic resilience. The indicator 'Good Governance' was developed by the Economic Freedom of the World Index and relies upon variables such as Judicial Independence, Impartiality of Courts, Protection of Property rights, Military Interference etc. Each variable is standardized to a 0 to 10 rating scale and then averaged to form 'Good Governance'. Thus, economies with poorly developed property rights, impartial courts, corrupt authorities etc. are assigned a 'Good Governance' rating closer to zero.

3.2.4 Social Development

The Social Development sub-index relies upon 2 variables (collected from World Bank Development Indicators): Gross enrollment ratio and life expectancy at birth. The Gross Enrollment Ratio may be regarded as a proxy for the level of education in an economy. Economies with higher enrollment ratios are likely to exhibit higher levels of educational attainment, social development and stability is the face of adverse shocks (i.e. they are more resilient). Similarly, economies with higher life expectancy are likely to have superior health care facilities. This in turn is quite conducive to social development and economic stability.

Table 1: Pair wise Correlation Matrix between Economic Resilience and its Sub-Indexes

	resindex	macrostab	microeff	goodgov	socdev
Resindex	1				
macrostab	0.4348***	1			
Microeff	0.3363***	0.1134**	1		
Goodgov	0.5757***	0.0743	-0.08378*	1	
Socdev	0.7882***	0.0662	0.2367***	0.2826***	1

Notes: ***, ** and * indicates

Overall index of resilience has been constructed by averaging the sub indices of above four aspects. Table 1 shows pair wise correlation between constructed resilience index and its component indices along with correlations between the components. Overall resilience index, has strong correlation with its components despite the fact that the pair wise correlation coefficients among the component sub indices are generally low.

3.3 Data

This study utilizes balanced panel data from 42 countries for the period 2001-2011. The sample was chosen on the basis of data availability; only countries with at least 3 years of Private Investment observations (the dependent variable) were considered. The main data sources were The World Bank's World Development Indicators and The Economic Freedom of the World Index. The appendix table A1 summarizes the variables used and the data sources.

3.4 Econometric Model

This study utilizes unbalanced panel data (for 42 countries across 11 years) and panel estimation procedures. Panel data offers numerous benefits such as enabling more degrees of freedom, reducing collinearity amongst variables and controlling for the presence of un-observable country characteristics (Baltagi 2005). Both fixed and random effects models of private investment are estimated. While fixed effect model takes the country specific factors as fixed, random effect model considers it as random with a constant variance. We include time dummies in both models to capture the common shocks to world economy. Hence, our model looks the following form:

$$Privateinv_{it} = \alpha_0 + \alpha_1 Resilience_{it} + \beta_k X_{k,it} + \sigma_t T_t + \mu_i + u_{it} \quad \ldots\ldots\ldots \quad (1)$$

Where, i = country, t = year, $Privateinv_{it}$ is private investment of the ith country at time t, *Resilience* is the resilience index, $X_{k,}$ is the vector of controls, μ_i is the unobserved country specific effect and T_t is time dummy, $\mu_i + u_{it}$ is the composite error term. While, μ_i is fixed over time for a country, the random effect model considers it as a random variable with mean zero and constant variance, i.e., $\mu_i \sim IID(0, \sigma^2_{\mu i})$. Hausman specification test is used to examine the appropriateness of the fixed versus random effect model. Furthermore, t and z statistics for fixed and random effect model respectively are computed on the basis of heteroskedasticity corrected standard errors. A positive and statistically significant value of the coefficient of resilience, α_1 will support our research hypothesis

As we are using annual data, the variables seem to be quite persistent in nature. Hence, lagged value of the dependent variable has strong relation with the current one. It we consider this persistence aspect, our model can be specified as

$$Privateinv_{it} = \alpha_0 + \alpha_1 Privateinv_{i,t-1} + \alpha_2 Resilience_{it} + \beta_k X_{k,it} + \sigma_t T_t + \mu_i + u_{it} \quad \ldots\ldots\ldots \quad (2)$$

It is quite obvious that μ_i will be correlated with the lagged dependent variable and thus estimated coefficients from the fixed (or random) effect model will be biased. Hence we also apply panel GMM approach as proposed by Arellano-Bond (1991). This approach

takes the first difference of the model (2) that eliminates μ_i from the differenced equation and thus eliminates the bias. Furthermore, the firs differenced lagged dependent variable is instrumented with its past levels.

Arlleno-Bond estimator of the differenced model is known as difference GMM estimation. However, lagged level of regressors may be poor instruments for the first differenced regressor. Such estimator may suffer from potentially huge small sample bias if number of time period is small and the dependent variable is highly persistent (Alenso-Borrego and Arellano 1999). Hence, we also use System GMM estimation technique as developed by Arellano Boover (1995) and Boover and Bond (1998) that minimize the bais by estimating a system of equation where differenced model is supplemented with a level equation with similar instrumenting technique. We report robust standard errors for both difference and system GMM estimator. Hansen's J test is used to check the viability of dynamic model. Difference in Hansen's test is used to test exogeneity of the instruments for levels in the system GMM estimation. Construction of a more general index of resilience in the setting of panel data along with estimation of the model with static and dynamic panel setting, as explained above, clearly provides a much better approach in examining the relationship between resilience and private investment.

4. Analysis of Findings

Table 2 presents fixed effect and random effect estimates of the model. First, we regress private investment on resilience index only (along with time dummy) leaving out all control variables. Fixed effect estimate of this simple model is reported in column (1) that clearly reveals a strong association between resilience and private investment. Fixed effect estimate of the full model including all controls are reported in column (2). The control variables have desired sign, but all of them are not statistically significant. Column 3 and 4 report random effect regression results of private investment with and without control. The results again reveal a strong association between resilience and private investment. As before controls are not always significant. Actually random effect results are even stronger in terms of significance of the parameter estimate and the overall fit of the regression.

Table 2: Static Panel Regression Estimates

Dependent variable: Private investment (Privateinv)

	Fixed Effect		Random Effect	
	1	2	3	4
Intercept	-23.23531 (-1.62)	-15.73304 (-0.24)	-16.55464 (-1.55)	13.62175 (1.49)
Resindex	6.499136** (2.64)	3.98263** (2.54)	5.460658*** (2.95)	3.564263*** (3.04)
M2/GDP		-0.0609596 (-1.09)		-0.0319396 (-0.73)
Real Interest		-0.0143761 (-0.58)		-0.0159766 (-0.81)
Fdiinflow		0.393909** (2.30)		0.3864481** (2.55)
gnigrowth		0.1399334 (1.36)		0.1709042** (2.00)
Credit		0.081635* (1.79)		0.0371421 (0.93)
publicinv		-0.5651694** (-2.89)		-0.5256991*** (-2.59)
Gni-pc		1.005093 (0.13)		-2.083726 (-1.61)
R2	0.0987	0.0664	0.1017	0.2781
F-stat	5.11**	36.96**		
Wald Chi-square			56.77**	1550.50**
Observations	269	217	269	217

Notes: ***, ** and * indicates significance at 1%, 5% and 10% respectively. Numbers in the parenthesis are the robust standard error based t and z ratios for fixed and random effect respectively. Time dummies are included in all regression.

Table 3: Hausman Test Fixed and Random Effects

Fixed Effects Equation	Random Effects Equation	Chi-square	p-value	Decision
(1)	(3)	5.01	0.9307	Cannot Reject Null, Use Random Effects
(2)	(4)	4.33	0.9996	Cannot Reject Null, Use Random Effects

Table 3 reports the results of the Hausman specification test comparing fixed versus random effect model. It is evident that null of appropriateness of random effect model cannot be rejected in regardless of whether control variables are included or not. Thus, we prefer a random effect model as our desired specification in the static panel model. Results of the random effect model are quite similar to that of fixed effect, except that it gives somehow better fit and higher statistical significance for resilience and FDI. According to static panel estimate economic growth has positive relation with private investment supporting accelrator model. A negative association between public and private investment support the crowding out hypothesis. FDI seems to complement private investment as they are positively related. Like may the earlier studies, interest rate have insignificant effect on private investment. Financial depth and private credit do not have any significant relation with private investment.

Table 4: Dynamic Panel Estimate

Dependent variable: Privateinv

	Difference GMM		System GMM	
	1	2	3	4
Privateinv(-1)	0.5559*** (3.05)	0.6020*** (3.46)	0.8079*** (7.06)	0.7258**** (6.20)
Resindex	3.2890*** (3.58)	1.4584* (1.72)	0.7785** (2.08)	0.9272** (2.11)
M2/GDP		0.0678 (1.32)		0.0050 (0.44)
Real Interest		0.0020 (0.15)		-0.0140 (-1.14)
Fdiinflow		0.1508 (0.83)		0.0655 (0.77)
Gnigrowth		0.1188*** (2.98)		0.1619** (2.67)
Credit		-0.0113 (-0.41)		0.0040 (0.57)
Publicinv		-0.4029*** (-3.16)		-0.1673** (-2.08)
Gni-pc		12.43*** (3.31)		-0.9720** (-2.70)
F-Stat	14. 68***	180.56***	1007.85***	5629.38***
Hansen J-test p-value	0.337	0.440	0.135	0.907
Diff in Hansen p value			0.518	0.681
AR(1) P value	0.171	0.054	0.053	0.027
AR(2) P value	0.660	0.792	0.458	0.842
No. of observation	212	172	245	199

Notes: ***, ** and * indicates significance at 1%, 5% and 10% respectively. Numbers in the parenthesis are the robust standard error based t ratios. Time Dummies have been included in all regression.

Table 4 presents dynamic panel estimate of our model in terms of both difference GMM and system GMM technique. To keep the number of instrument in reasonable limit we used up to 3 lags for instrumenting. Hansen J test p-values are all more than standard significant level. AR test suggest that there is no second order autocorrelation as required by both difference GMM and system GMM model. These results validate the dynamic panel model. As indicated before, GMM estimates are more reliable the static estimate in the presence of persistence in data. Economic resilience has strong positive impact on private investment when difference GMM model is estimated without control. However, the co-efficient becomes smaller when controls are added (model 2) and it is significant at 10% significance only. We estimate the models using system

GMM technique, resilience index become significant at 5% level, but the magnitudes of the coefficient become smaller[1]. Thus, although there is some variation in magnitude, resilience has statistically significant relationship with private investment in all four dynamic panel models. Growth of PCI has positive association with private investment in both difference GMM and system GMM model. Similarly, public investment has a negative relation with private investment in both dynamic panel models. Estimated coefficient of per capita income is not robust at all. While it is positive in difference GMM model, at appears negative in system GMM model. FDI has no significant relationship with private investment in the dynamic panel model. Other variables are statistically insignificant as before.

5. Conclusion

The paper made an attempt to assess the impact of economic resilience on private investment. It constructs a resilience index that is comparable both across countries and over time using a broad set of data relating to resilience. Based on flexible accelerator model, the paper builds a model of private investment which is estimated using both static and dynamic panel regression model. Given the persistence nature on annual data, dynamic panel models seem to provide more reliable estimate. The major finding of the paper is that economic resilience has a strong impact on private investment. The positive relation between resilience and private investment has been found to be robust over alternative models of estimation. Thus, our research hypothesis is strongly supported in the study. There are few other findings which are mostly consistent with existing studies. Public investment has robust negative relationship with private investment supporting the crowding out phenomenon. Growth of per capita income has robust positive relation with private investment in line with accelerator principle. In none of the model real interest became significant implying its limited role determining private investment.

Economic resilience, by itself, is important for better performance of the economy. The present study finds a strong impact of resilience on investment, pointing to another particular importance of economic resilience. Thus, economic resilience is important for fostering economic growth through investment, a finding which has not been explored before. This enriches the literature on economic resilience. The findings of the study have significant implications for policy makers. As we have seen, most of the variables used to construct economic resilience are related to public policy, level of institutions and human development of the country. Hence, policies must be taken in this arena to improve overall resilience of a country so as to enhance private investment that is crucial for economic growth.

Although the study made significant contribution in constructing resilience indicator and the econometric methodology of analysis, it has some limitation. Construction of resilience index requires a wide range of data from socio economic field, many of them are not always available. Data availability effectively reduces the sample size in terms of number of countries and time period covered. Nevertheless the paper is able to show the positive relations between economics resilience and private investment that is

[1]In general size of the coefficient of resilience (and some other variables) are smaller in dynamic model

robust alternative specification. This study may be quickly extended to examine the impact of economic resilience on foreign direct investment.

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Appendix

Table A1: Variables used in Final Model

Variables Used in Final Model		
Variable	**Description**	**Source**
privateinv	Gross Fixed Capital Formation, Private Sector (% of GDP)	World Bank's World Development Indicators
M2/GDP	Broad Money (% of GDP)	World Bank's World Development Indicators
Real	Real Interest Rate (%)	World Bank's World Development Indicators
Fdiinflow	Foreign Direct Investment, Net Inflows (% of GDP)	World Bank's World Development Indicators
Gnigrowth	GNI Per Capita Growth (Annual %)	World Bank's World Development Indicators
Credit	Domestic Credit to Private Sector (% of GDP)	World Bank's World Development Indicators
Publicinv	Gross Fixed Capital Formation (% of GDP) – public sector Sector (% of GDP)	World Bank's World Development Indicators
Gmi-pc	GNI Per Capita, PPP (Constant PPP Prices)	World Bank's World Development Indicators

Table A2: Variables Used in Economic Resilience Index

Variables used in Economic Resilience Index (resindex)			
Sub-Index	**Index Variables**	**Description**	**Source**
macrostab	Fiscal Surplus/Deficit to GDP Ratio	Cash Surplus/Deficit (% of GDP)	World Bank's World Development Indicators
	Sum of Inflation and Unemployment Rates	Inflation, consumer prices (Annual %)	World Bank's World Development Indicators
		Unemployment, total (% of total labor force) (modeled ILO estimate)	World Bank's World Development Indicators
	Net ODA to GNI Ratio	Net ODA received (% of GNI)	World Bank's World Development Indicators
microeff	Government size	Government Consumption	Economic Freedom of the World Index
		Transfers and Subsidies	Economic Freedom of the World Index
		Government Enterprises Investment	Economic Freedom of the World Index
		Top Marginal Tax Rate	Economic Freedom of the World Index
	Freedom to Trade	Tariffs	Economic Freedom of the World Index
		Regulatory Trade Barriers	Economic Freedom of the World Index
		Black Market Exchange Rates	Economic Freedom of the World Index
		Controls on the Movement of People and Capital	Economic Freedom of the World Index
goodgov	Good Governance	Good Governance	Economic Freedom of the World Index
socdev	Gross Enrollment Rate	Gross Enrollment Ratio, Primary, Both Sexes (%)	World Bank's World Development Indicators
	Life Expectancy at Birth	Life Expectancy at Birth, Total (Years)	World Bank's World Development Indicators

Table A3: List of Countries Included in the study

Sl.	Country Name
1	Albania
2	Bangladesh
3	Barbados
4	Belize
5	Bolivia
6	Brazil
7	Cameroon
8	Cote d'Ivoire
9	Croatia
10	Egypt
11	El Salvador
12	Honduras
13	India
14	Iran
15	Japan
16	Jordan
17	Kenya
18	Madagascar
19	Malaysia
20	Mexico
21	Nepal
22	Nicaragua
23	Pakistan
24	Panama
25	Paraguay
26	Peru
27	Philippines
28	Poland
29	Romania
30	Russia
31	Senegal
32	Slovenia
33	South Africa
34	Sri Lanka
35	Thailand
36	Trinidad & Tobago
37	Tunisia
38	Turkey
39	Uganda
40	United States
41	Uruguay
42	Venezuela