Vengesai, Edson; Muzindutsi, Paul-Francois

Article

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Country Risk Components and Firm Investment Behaviour of JSE Listed Firms

Edson Vengesai[1], Paul-Francois Muzindutsi[2]

Abstract: The study examines the impact of country risk (financial, political and economic risk) and shocks on investment at firm level. Corporate financing theory proponents, assuming perfect markets, argues that investment policy of a firm should depend solely on its earnings generation power focusing mainly on the effects of firm specific factors ignoring the role of country risk factors**.** Building on the firm investment behaviour theory the role of country risk factors in determining firm investment is analysed. This study employed a dynamic panel model estimated with the Generalised Methods of Moments estimation methodology to analyse a panel of 294 non-financial firms listed on the Johannesburg stock exchange. Results establish that high risk score (low risk) is positively associated with investment. Shocks in risk ratings were also found to be negatively associated with investment at firm level. Regarding risk shocks, the result suggests that not only the level of risk matters but, risk changes also affect firm investment levels. These findings imply that country risk levels constrain firm investment as firms lower their investment levels following an increase in country risk. This study contributes to debate on the topic by identifying the specific risk components that are more detrimental to firm investment as opposed to investment analysis at aggregate level from previous studies.

Key words: Country risk; firm investment; GMM; JSE

JEL Classification: G10; G32

1. Introduction

A substantial theoretical and empirical literature on the drivers of firm investment in different economies has appeared over the years but never sufficient. The world system is becoming more dynamic, firms engage in many practices to evolve with economic and technological advancement (Dale*, 2005). As such the factors that influence the behaviour of firms evolve with the advancement of the global system. Modigliani and Miller (1958) traditionally argued that in an efficient market the investment policy of a firm should depend solely on its ability to generate earnings and cash flows. In real world market imperfections and information asymmetry are inevitable. As such considerable advances in theory and measurement have been made. Asymmetric information, market imperfections and financial market dynamics from globalisation have opened Pandora's Box in the evolution of financial theory (Vilasuso & Minkler, 2001). Financial theory reveal that shareholders, bondholders and managers interactions generate frictions which induce underinvestment and overinvestment (Myers & Majluf, 1984).

Globalisation and democratisation trend have exposed developing countries to greater scrutiny and accountability (economically, financially, socially and politically) from a broader global perspective. The global financial crisis fuelled the need for investments in growing markets, with Africa among the economies offering higher returns on foreign investments (Goetzmann & Kumar, 2008). Increased

[1] Postdoctoral Fellow in the School of Accounitng, Economics and Finance, University of KZN, South Africa, E-mail: vengesaiE@ukzn.ac.za.
[2] Associate Professor in the School of Accounting, Economics and Finance, University of KZN, South Africa, Corresponding author: muzindutsip@ukzn.ac.za.

international investment and diversification has exposed firms to different risk exposures and accelerated the assessment of economies to different risks (Hayakawa, Kimura, & Lee, 2013). According to the International monetary fund (IMF.org, 2018) South Africa is rated among the most promising emerging markets which offers an exclusive blend of highly industrialized economic infrastructure and a vivacious emerging market-economy. South Africa is endowed with innovative financial services infrastructure with the JSE being among the world's top 20 exchanges, a well-diversified economy, progressive constitution and independent judiciary, favourable access to Global markets and a location of choice for Multinational companies (UNCTAD, 2018). However, there is a notable decline in private sector investment since the 2008 financial crisis. The dearth of the private sector investment has been pointed as one of the reflectors of South African economic stagnation in the last ten years (Nicolai & Vincent, 2018). The private sector investment, as by 2018, was around 20percent lower than the pre 2008 Global financial crisis period. Nicolai and Vincent (2018) states that the private sector was on an "investment strike" due to political and economic uncertainty.

Globalization broadened international operations coupled with an exposure to respective country risk in the host economies. Country risk can be broadly classified into financial, economic and political risk. Considering risk factors in South Africa, the political and economic uncertainty eroded business & consumer confidence lowing private sector investment (WorldBank, Dept, & Group, 2018). Volatility of the rand of up to 8.6 percent between 20017 and 2018, an increase in inflation to the upper bound of the -6 percent target 3 lowered the growth of the economy averaging 1 percent in 2017 and 2018 and increased economic risk rating (IMF.org, 2018). High levels of crime, civil unrest and lack of precision on policy and structural reforms hampered investor potential and these challenges have affected investment levels over the years. As such there is a dynamic progression on country risk adjustment. The developments in country risks pauses questions on the role of these risks on investment stagnation. Previous studies on country risk and firm investment across the world including Hayakawa et al. (2013), Kazunobu, Fukunari, and Hyun-Hoon (2011), Bloom, Bond, and Van Reenen (2007) and Panaretou (2014) examined the effect of risk components on real investment at aggregate level. Studies that focused on firm investment have not considered the role of country risk at firm level. The role of dynamics and shocks in country risk on firm level investment remains unanswered and more specifically the relationship between investment and political, economic and financial components of country risks at firm level has not been investigated. This study closes this gap by investigating how the shocks in country risk components on firm investment in the South African context. In a way the study contributes to debate on this topic by identifying which risk components that are more detrimental to firm investment.

2. Literature

From the theoretical perspective, the behavioural theory posits that risk averse managers will avoid investing in countries with high political risk (Johnson & Tversky, 1983). The traditional economic theory posits that managers are homogeneous and characteristically may act in the best interest of shareholders (Slovic, 1987). On the other end, the behaviourists argues that how executives manages their firms is dependent of individual manager's characteristics (Gervais, Heaton, & Odean, 2011; Palomino & Sadrieh, 2011). Form the traditional economic theory perspective investment will be homogeneous, managers make investment decisions based on shareholder risk appetite. However, the behavioural approach implies that investment decisions for a given risk level will vary across firms depending on management behaviour, characteristic, phycological biases and risk tolerance. In this

context, the behavioural theories predict low investment in risky countries for firms with risk averse executives with low personal risk profiles.

The Agency theory predicts that firms with risk averse managers invest less in economies with high country risk if there is less inclination to shareholder interests (Kazunobu et al., 2011). The degree of misalignment between shareholder interests and managers exacerbates the extent to which the firm executives will make decision in their own interests at the expense of shareholders. R. M. Stulz (1984), and Smith and Stulz (1985) argue that in situations when the agency conflicts are particularly acute, there is a higher degree to which high risk averse managers will implement risk management in accordance with their personal tolerance to risk. Gormley and Matsa (2016) in investigating managerial preferences, risk and agency conflicts found evidence that young managers due to agency driven concern "play it safe" by making risk reducing investments. Thus, such firms will avoid economies, sectors or assets with higher risk. On the other hand, firms with high risk-taking managers will invest more in economies, sectors or assets with high risk in search of higher returns (Bali & Cakici, 2010).

The efficient market hypothesis (EMH) under the assumptions of perfect market and rational investors argues that markets are efficient and a true reflection of all the available information. In such a market investors cannot persistently and predictable beat the market in any investment analysis, hence, the only way investors can profit is through investment is risky assets (Malkiel, 1989). From this argument, the EMH thus predicts high investment levels for risky environments or asset classes as the only way that yields higher returns (Cermeño & Suleman, 2014). Thus, higher country risk must be associated with high levels of investment, however, in practice there is investment stagnation in such countries. At aggregate level, Kazunobu et al. (2011) empirically investigated the impact of financial risk and political risk on foreign direct investment (FDI) and concluded that higher political risk lowers FDI, financial risk was found to be uncorrelated with FDI. This finding was supported by Hayakawa et al. (2013), who found political risk to negatively impact FDI in a sample of developing economies. Additionally, Giambona, Graham, and Harvey (2017) document that almost 50 percent of firms avoids FDI as a result of high political risk in the target countries. Busse and Hefeker (2007) and Ali, Fiess, and MacDonald (2010) documents political stability as a major determinant of investment. Bevan and Estrin (2004) in analysing the determinants of FDI in European transition economies highlights that economic risk plays an important role in attracting investment.

The majority of these studies analysed the impact of political and financial risk on FDI and aggregate variables. However, FDI on aggregate variables may not capture firm specific investment hence the need for a study at the disaggregated level. The present study contributes to literature through examining the effects of the country risk components on investment at firm level.

3. Methodology

Data and Variables

The study considered 401 firms listed on the JSE for a 23-year period (1995 to 2018). Listed firms were selected specifically for the availability of reliable public financial data. Firm level annual data was obtained from financial statements through the Bloomberg L.P (2019) online financial database. Firms with reported financial data of at least 4 years were kept in the sample this is line with the estimation technique, which requires at least three observation to allow instrumentation and

differencing process. The study employed an unbalanced panel data, after screening and checking for missing variables and coding errors, 294 firms were left for estimation. The benefits of panel data includes the ability of reducing co-linearity of explanatory variables, allows observation of multiple phenomena over multiple time periods improving econometric estimates efficiency (Akhtar & Oliver, 2009)

Firm level investment was measured as relative investment defined as the sum of investment (capital expenditures) per one unit of fixed assets and this is consistent with (Aivazian, Ge, & Qiu, 2005; Lang, Ofek, & Stulz, 1996). Four different risk indices of country risk namely financial risk, political risk, economic risk and composite index were used for analysis. The paper employed country risk data developed by the ICRG. Bekaert and Hoerova (2014), Hoti, McAleer, and Shareef (2005), Howell Llewellyn (2013) show that ICRG data measures and predicts risk better than other risk providers. Political risk measure offers an assessment of the country's political stability (Howell Llewellyn, 2013). To assess political environment, the ICRG methodology uses twelve risk components including, law& order, government stability, socio economic conditions, corruption, eternal conflict, military in politics, ethnic tension, internal and external conflict, investment profile, bureaucracy quality and democratic accountability (Howell, 2011). Economic risk evaluates economic strength and weaknesses through economic risk components (GDP per capita, inflation, budget balance and GDP growth) (Howell Llewellyn, 2013). Countries with low economic risk economic strength outweighs weaknesses and a higher economic risk results from economic weaknesses that outweighs strengths (Suleman & Randal, 2016). Financial risk measures the ability of a nation to service its official debt obligations and commercial trade. The financial risk index is assessed through international liquidity, exchange rate stability, and foreign debt as a percentage of GDP (Howell, 2011). The composite index, which measures the overall country risk, is the weighted average of political, financial and economic risk indices. The higher the risk point the lower the risk (Howell, 2011). Following previous studies (Aivazian et al. (2005); Vengesai and Kwenda (2018); Muñoz (2013); Yuan and Motohashi (2014), standard variables which influence firm investment intensity were used as explanatory variables. Cash flows were used to control for financial constraints measured as a ratio of cash from operations to net fixed assets, Tobin's Q (market to book value of assets ratio) as a proxy for growth opportunities, sales scaled by net fixed assets used to control for size and the ratio of debt to total assets to capture financial leverage.

4. Model Specification

The Lang et al. (1996) standard reduced form investment model was extended to a dynamic panel model since panel data is under consideration. Investment trends are dynamic, firms thrive to smoothen their investment patterns overtime as such previous investment behaviour influences current patterns. The inclusion of the lagged dependent variable helps to measure the influence of past investment on current investment levels and reduces auto correlation arising from any misspecification (Arellano & Bond, 1991). Through the estimation technique, a dynamic panel model helps in controlling for possible endogeneity and heterogeneity problems in the sample data. The dynamic model captures investment dynamics over time and allows partial adjustment mechanism modelling (Baum, Barkoulas, & Caglayan, 2001)

The general dynamic model which captures individual effects is given as;

$$y_{i,t} = \gamma y_{i,t-1} + \sum_{i}^{j} x_{it}\beta + \vartheta_i + \varepsilon_{i,t}; |\gamma| < 1 \qquad (1)$$

Where ϑ_i is a fixed effect, $y_{i,t-1}$ is the lagged dependent variable, x_{it} is explanatory variables vector with j factors (j=1..., 4). $\varepsilon_{i,t} \backsim N(0, \sigma^2{}_{\varepsilon})$ random disturbance and assuming $\sigma^2{}_{\varepsilon} > 0, \in (\varepsilon_{i,t}, \varepsilon_{j,s}) = 0$

Extending from equation one specific dynamic models estimated are specified as:

$$\frac{I_{i,c,t}}{K_{i,t}} = \omega_0 + \xi \frac{I_{i,c,t}}{K_{i,t-1}} + \vartheta_1 X_{i,t} + \vartheta_2 \Delta X_{i,t} + \gamma\, lev_{i,t} + \psi CF_{i,t} + \delta Q_{i,t} + \eta_{i,} + u_{i,t} \qquad (2)$$

Where; $X_{i,t}$ are exogenous variables for the risk measures (financial; economic, political or composite index), $\Delta X_{i,t}$ is the change in risk. ϑ_i; ϑ_2 are parameters of the country risk components to be estimated; $lev_{i,t}$; $CF_{i,t}$; $Q_{i,t}$ Respectively, leverage, cash flows and Tobin's Q for firm i at time t.; γ; ψ; ξ and δ are parameters to be estimated. η_i is time invariant unobservable specific effects and $u_{i,t}$ is the error term.

4.1 Model Estimation

Measurement errors, omitted variables, likelihood of Tobin's Q being an endogenous variable and possible bi-directional causation between investment and leverage can give rise to endogeneity problems and correlation between the explanatory variables and the error term (Muñoz, 2013). The presence of the lagged dependent variable, in model two, introduces autocorrelation due to the correlation of $\Delta I_{i,t}$ $(I_{i,t} - I_{i,t-1})$ and $\Delta \varepsilon_{i,t}$ $(e_{i,t} - e_{i,t-1})$ and dynamic bias that cannot be controlled by traditional estimation techniques (OLS, Fixed & Random effects) (Antoniou, Guney, & Paudyal, 2008). In such conditions, there is need to introduce stochastic variation into the model. The System GMM attests to it being the suitable estimation technique in the presence of serial correlation from idiosyncratic disturbances, endogenous explanatory variables and heteroscedasticity (Roodman, 2006).

The system GMM instruments differenced equations with levels instruments and instruments levels equations with first differenced instruments generating a system of equations. The lagged and levels endogenous instruments make endogenous variables predetermined and reduce auto correlation with the error term (Blundell & Bond, 1998). The second equation generated from the system of equations provides additional instruments of the lagged first differenced variable (I_{t-1}) increasing efficiency (Roodman, 2006).

Through first differencing equation two is transformed to;

$$\Delta \frac{I_{i,c,t}}{K_{i,t}} = \omega_0 + \xi \Delta \frac{I_{i,c,t}}{K_{i,t-1}} + \vartheta_1 \Delta X_{i,t} + \vartheta_2 \Delta X_{i,t} + \gamma \Delta\, lev_{i,t} + \psi \Delta CF_{i,t} + \delta \Delta Q_{i,t} + \Delta u_{i,t} \quad (3)$$

The fixed effect η_i does not vary over time and by differencing the regressors it is removed. Autocorrelation arising from the presence of the dynamic term $I_{i,t-1}$ is controlled by instrumentation with differenced and levels instruments. The orthogonal conditions in the variance-covariance utilization capacitates control for simultaneity, heteroscedasticity, correlation of errors and address endogeneity problem (Antoniou et al., 2008). The models were estimated with the Blundell and Bond (1998) two-step system GMM.

5. Empirical Results

Table 1 reports the descriptive statistics for firm investment and country risk components of JSE listed firms. The descriptive statistics show low investment levels for JSE listed firms, capex as a ratio of net fixed assets averages 0.2569. Low investment rates are a cause for concern for the growth of the economy. The standard deviation of investment (0.2029) is almost equal to the mean indicating high variability of investment levels, implying lack of investment consistency in JSE listed firms. Regarding country risk components, economic and financial risks have higher lower average rating 35.22 (0.7) & 37.77 (0.76%) compared to political risk 67.37 (0.67). A lower rating indicates a higher potential risk, thus there is higher political risk in South Africa compared to economic and financial risks.

Table 1 further shows that political risk is more variable as shown by a higher standard deviation (3.48) compared to financial and economic risks with 1.2 and 1.7. A higher standard deviation indicates more volatility in political risk environment. The analyses of the statistics show that the leverage levels of South African listed firms are low as shown by lower mean value. The average Tobin's Q ratio of 1.5 on average indicates a higher expectations of strong growth opportunities for JSE listed firms, implying that South African firms on average can be classified as high growth firms. The descriptive statistics show high variability of cash flows as shown by a higher standard deviation (3.77) relative to the mean (1.06). This can be explained by volatile business cycles and economic conditions and uncertainty.

Table 1. Descriptive statistics

Variable	Description	Obs	Mean	Std. Dev.	Min	Max
INV	Investment	3,291	0.2569	0.2029	0	1.26
FR	Financial risk	5,662	37.7668	1.1932	35.67	39.83
PR	Political risk	5,662	67.3765	3.4758	62.67	74.08
ER	Economic risk	5,662	35.21699	1.7458	32.51	38.04
CR	Composite index	5,662	49.5959	7.1752	31.33	56.04
FRC	Financial risk change	5,662	-0.2603	1.1127	-2.04	2.04
ERC	Economic risk change	5,662	0.1429	1.1853	-2.13	3.87
PRC	Political risk change	5,662	-0.3942	2.4984	-5.34	6.12
CRC	Composite risk change	5,662	-1.0122	3.9794	-18.22	3.61
CFN	Cash flow	3,301	1.0557	3.7650	-31.500	41.71
Q	Tobin's Q	3,143	1.4653	0.7663	.5061	5.62

Table 2. Dynamic panel-data estimation two-step system GMM

Risk	**Financial**	**Economic**	**Political**	**Composite**
Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**
$\xi - Lagged\ dep$	0.671***	0.413***	0.374***	0.364***
	(0.0860)	(0.1030)	(0.116)	(0.112)
$\vartheta_1 Risk\ component$	0.00320	0.009***	0.0048***	0.002***
	(0.0027)	(0.0022)	(0.0014)	(0.0005)
$\vartheta_2 \Delta - Risk\ shock$	-0.007**	-0.0067**	-0.0043***	-0.001**
	(0.0031)	(0.0030)	(0.0014)	(0.0006)
$\gamma - leverage$	-0.114***	-0.132***	-0.107***	-0.118***
	(0.0322)	(0.0410)	(0.0375)	(0.0392)
$\delta - Tobin's\ Q$	0.0124**	0.015***	0.0149***	0.016***
	(0.0058)	(0.0054)	(0.0056)	(0.0058)
$\psi - Cash\ flow$	0.0063***	0.006***	0.0057***	0.0055***

	(0.0017)	(0.0019)	(0.0019)	(0.0019)
Observations	2,378	2,378	2,378	2,378
Number of ID	241	241	241	241
Instruments	38	44	60	60
AR (1)	0.0000	0.0000	0.0000	0.0000
AR (2)	0.1950	0.6250	0.7210	0.7340
Hansen Test	0.1500	0.3520	0.4470	0.5330
F (6.2410)	26.570	18.480	19.340	17.960
Prob > F	0.0000	0.0000	0.0000	0.0000

Corrected standard errors in parentheses, The AR (2) tests for autocorrelation, and the Hansen test tests for over identification of instruments *** p<0.01 *significant at 1% level,* ** p<0.05 *significant at 5% level,* * p<0.1 *significant at 10% level.* ξ *is the coefficient of the lagged dependent variable.* ϑ_1 *Is risk score (financial, economic, political and composite risk).* $\vartheta_2\Delta$ *Change in risk,* γ *leverage,* δ *Tobin's Q and* ψ *cash flow.*

Tables 2 shows the regression output of the dynamic models. Four different models for financial, economic, political and composite risks were estimated. The system GMM with orthogonal option (since we have unbalanced panel data) was used to estimate the models. The results provide evidence that there is a statistically significant positive relationship between investment and economic, financial and political risk ratings as shown by positive and significant $\vartheta_1$coefficients. As given by the ICRG methodology, a higher rating implies lower risk. Hence, the positive relationship implies that a higher rating level (low risk) is associated with high investment. Thus, the increase in economic and political risk (model 2 and 3) lowers investment at firm level.

Therefore, economic and political risk have a constraining effect on firm investment. The results are in line with the Behavioural theory that investors will reduce investment in countries with high political risk (Johnson & Tversky, 1983). The finding is consistent with Hayakawa et al. (2013), Kazunobu et al. (2011), who found a positive association between political risk and foreign direct investment in developing economies. The results also support Busse and Hefeker (2007) hypothesis that political risk is among the major determinant of investment. The coefficient of $\vartheta_2\Delta$ under economic and political risk is negative and statistically significant, implying that not only the current level of economic and political risk is an important determinant of firm level investment but the change in risk rating over time significantly influences firm investment. Shocks in economic and political risks ratings have a significant adverse effect on firm discretionary investment.

Regarding financial risk, the results indicates a positive association between the index score and firm investment, indicating a potential reduction in investment following an increase in risk. However, consistent with Kazunobu et al. (2011), the relationship is not statistically significant, implying that JSE listed firm's investment levels are not too sensitive to financial risk levels of the country. Thus, South African firms do not consider financial risk in making their investment decisions. The coefficient for financial risk shock $\vartheta_2\Delta$ is negative and statistically significant, implying that firm investment negatively correlates with changes in financial risk index score. The change in financial risk is more important than the level of financial risk in determining firm level investment in South Africa. For the composite index, the weighted average of political, financial and economic risk measuring the country risk, the results show that an increase in the composite country risk score (low risk) results in an increase in firm investment levels. The higher the risk rating the lower the potential country risk and the higher the investment. This finding is consistent with Giambona et al. (2017) who documents that 50 percent of firms avoid investment in economies with high country risk. The

coefficient of country risk shock $\vartheta_2\Delta$ is also negative and statistically significant, this implies that overall the change in country risk also has a significant negative impact on firm investment. Firms lower their investments levels following shocks in country risks.

In consistent with dynamic stability, the lagged dependent variable coefficients (ξ) are less than one in all four models. ξ parameter is positive and statistically significant indicating that previous investment levels plays a significant role on the current level of investment of firms. The positive relationship between investment and the lagged investment imply that firms with high investment levels invest more in the subsequent periods, periods of higher investment are followed by periods of higher investment and periods of lower investment are followed by periods of lower investment indicating investment persistency in JSE listed firms. The rate of convergence given by 1- α , (α is the coefficient of ξ) is almost 0.6 for the 3 models (economic, political and composite risk) indicating an average reflection on the impact of previous investment on current investment level. The lower coefficients indicate that the speed of adjustment is low. Consistent with Aivazian et al. (2005); Lang et al. (1996); Yuan and Motohashi (2014); Vengesai and Kwenda (2018) leverage was found to be negatively correlated with investment. This is consistent with the debt over hang hypothesis that leverage induces under-investment through the reduction in the incentive to take on profitable investment given that benefits accrue to bondholders rather than to shareholders (Jensen & Meckling, 1976; Myers, 1977; Stulz, 1990). The liquidity hypothesis argue that firms that are more committed to interest payments (high leverage) invest less regardless of their growth opportunities (Aivazian et al., 2005).

The availability of internal funds measured by cash flows is positively associated with investment, implying that firms that generate higher cash flows have high investment levels. The results indicate a positive and statistically significant relationship between firms' level of investment and Tobin's Q, this shows that growth opportunities are a significant determinant of firm investment. Firms with high growth opportunities have higher investment ratios. The GMM estimator is consistent in the absence of second order serial correlation in the residuals of the differenced equations. The Arellano-Bond AR (2) test was used to test for correlation. In all the equations Arellano-Bond, AR (2) test is more than five per cent, hence the absence of auto correlation null hypothesis cannot be rejected. Testing the legitimacy of instruments and model specification is crucial in dynamic panel data analysis, moment conditions must be tested for over-identification (Roodman, 2006). The Hansen/Sargan test of over identification restrictions were used. The Hansen tests are above five per cent for all four models providing evidence of correct identification of instruments and correct specification of the models.

6. Conclusion

Financial literature is crowded with empirical studies on the effects of political and financial risk on FDI and other aggregate variables such as GDP. No studies conducted to assess the impact of these risks at firm level. To close this gap and add to this scanty literature the present study examined the impact of country risk components (financial, political and economic risks) and risk shocks on investment at firm level for JSE listed firms. Using a dynamic panel model estimated with the system GMM, the study found that political, economic and overall country risky negatively impact investment at firm level. JSE listed firms reduce investment following an increase in economic, political and overall country risk. Regarding financial risk no significant relationship was found between financial risk and firm investment, implying that levels of financial risk do not significantly affect firm

investment in South African listed firms. The study also examined the effects of changes in risk ratings on firm investment. We found evidence that not only the levels of risks affect investment but the changes in risk from year to year have a negative impact on firm investment. For all the risk components the study found a negative relationship between risk changes and firm investment. The reduction in firm investment following an increase in country risk suggest that South African investors are more risk averse. Policy effort to reduce country risk and shocks to improve investment is therefore recommended.

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