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DOES FIRM'S LIFE CYCLE STAGES AFFECT THE COST OF EQUITY CAPITAL IN ASIA?

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ABSTRACT

The research paper focuses on a dynamic resource-based view that highlights a significant change in paths and patterns of the evolution in organizational capability through the life cycle stages. A sample of 830 Asian firms for 2006-2017 is used for analysis. The paper reveals that the cost of equity capital is negatively associated with retained earnings. In the second stage, the study also highlights that cost of equity capital turns out to be lower in the growth and maturity stages and there is a significant difference in determinants of the cost of equity capital during different stages of the life cycle.

Disciplinary: Financial Management.

1 INTRODUCTION

Is age just a number? This paper digs deep into the dynamics of firm aging. Companies usually do not follow the typical old school aging some tend to remain in the growth stage for decades while others tend to mature at an early stage and others move to the decline stage after few years. Moving from one stage to another, the company demonstrates a different set of characteristics, with a different level of equity capital cost (Ahmad & Ali, 2017). The price of external financing tends to change over the firm life cycle (FLC), firms may capitalize on such opportunities to take advantage by issuing capital that suit them (Ting & Chin, 2017). A company going to primary markets brings another set of challenges, resulting in the devaluation of the issued capital and the creation of negative shareholders' wealth and increasing the equity cost. Though these theories explain different means of capital financing, yet the literature strongly supports the traditional way of financing. The marketing timing theory is based on the idea that the managers used market performance and macroeconomic conditions to gauge their financing. Sometimes, new equity can be a preferred option in case the stock is overvalued and the market is performing quite positive and vice versa. The

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researchers have filtered these concepts and provided evidence in one way or the other.

The firm's equity cost heavily relies on the availability of the resources that varies during the firm's life cycle stages. Many factors determine equity costs during different life cycle stages based on resource-based views. Thus, this study focuses on major Asian countries, as each stage may have different impacts on equity cost capital; hence, the study also highlights each stage by introducing a stage dummy in regression.

2 LITERATURE REVIEW

Some studies show links between equity cost and corporate life cycle empirically through the development of sustain competitive advantages by developing productive resources (Naseem *et al.*, 2017). The challenge is that how firms find out the optimal mix of resources and devise the complementing strategies at a given stage of their life cycle to capitalize upon the inherent opportunities. Further research implies that the stages of the life cycle have suggestions for appraising the financial outcome of the organization (DeAngelo & Stulz, 2006; Dickinson, 2011).

2.1 FIRM LIFE CYCLE (FLC)

The FLC starts from its creation to its termination and was developed by using biological considerations in economics and finance. A firm's performance alters with the stages of the life cycle (Miller & Friesen, 1980). Different studies used life-cycle views to describe different attributes of the firms. Some studies explored the significance of FLC stages with respect to financial performance and competitive advantages based on accumulated resources over a firm's life (DeAngelo *et al.*, 2006; Dickinson, 2011). Miller and Friesen (1980) thoroughly highlighted the significant of FLC stages for a firm's performance; they recognized five stages of the life cycle as birth, growth, maturity, revival, and decline. Black (1998) looked at the corporate life cycle theory as a denotation of product life cycle theory mainly used in microeconomics and marketing literature. This study follows the novel work of Dickinson (2011) who stated five stages of a firm's life cycle (Table 1).

Table 1: Division of Firms into FLC Stages (after *Dickinson (2011)*)

Cash flow from	Birth stage	Growth stage	Maturity stage	Shakeout stage	Decline stage
Operations	-	+	+	+/-	-
Investing	-	-	-	+/-	+
Financing	+	+	-	+/-	+/-

2.2 COST OF EQUITY CAPITAL

The equity cost is dependent on a firm's and industries' economic indicators, dynamics, and the country's overall economy (Fama & French, 2001; Gebhardt *et al.*, 2001). The firm-specific factors include its size, leverage, overall riskiness, level of disclosure, and financial strength. Bottazzi *et al.*, (2007) opined that many investors pool their money in a firm for promising financial returns but some want to achieve specific strategic objectives complementing financial returns on their investments. Such strategic investors seek synergies providing their already established businesses competitive advantages in the industry.

2.3 RESOURCE-BASED REVIEW (RBV)

The RBV formulated an association with the industrial organization (Porter & Millar, 1985).

RBV focalizes on the organizational internal structure based performance, while the IO view focuses on the firms' performance determinants outside the firm, like the structure of its industry and economic conditions. RBV explains the reason behind differences in performances of firms belonging to the same industry. The firms with RBV opportunity exercise a competitive advantage over their counterparts (Helfat & Peteraf, 2003). SCA (sustainable competitive advantage) no longer be the part of the firm in long run but have the strategic opportunity for the firm in the short run; hence, this concept guides the management toward the adoption of a dynamics approach to sustain the dynamic capabilities (Huo *et al*., 2018). The resource development to enhance productivity according to the future requirement could enable the firm to gain dynamic sources of SCA (Makadok, 2001). RBV became popular articulating the significance of the relationship between firms' resources, external environment, and competitive advantages.

2.4 INFORMATION ASYMMETRY THEORY

The theory of "Asymmetric information" was developed during the period of 1970-80s with the proposition that the inefficient performance of financial markets is the result of imbalanced information among traders of securities (Stiglitz & Weiss, 1981). The underlying assumption is that there are a few parties to a transaction possessing relevant pertinent information which other parties do not. Equity cost varies with the risk or uncertainty level in the firms, investors require less return on their investment in the larger firm due to information availability about management and transparency of potential earnings (Banz, 1981). Hasan *et al*. (2015) posited that the firms had a long presence in the market make it well known to investors that could lessen the information asymmetry and eventually could attract the investors. It attracts liquidity and could affect the equity cost capital of the firm (Helfat & Peteraf, 2003).

2.5 RELATIONSHIP BETWEEN FLC AND EQUITY COST

Firms differ in abilities to gather funds from the market according to their life cycle stages (Berger & Udell, 1995). Firms during the initial stage tend to be less followed by investors and analyst, hence these firms experience information asymmetry resulting in equity mispricing (Myers & Majluf, 1984), leading to an increase in perceived riskiness and a higher equity cost (Armstrong, *et al*., 2011). However, the firms belonging to the mature stage are followed well by the market analyst resulting in lower information asymmetry and less equity cost.

The term 'strategic investors' is used for investors who are interested in investing in firms operating in the growth stage. In contrast, theoretically, the introduction and decline stages have similar characteristics, which mainly include negative or fewer profits, a negative EPS, and a negative return on the net operating assets (Dickinson, 2011). In addition to this, as the resources change with each stage of firms, the firms differ in financial management, technology, human resources, physical assets, marketing, and HR practices (Barney, 1991), which are crucial to explaining the growth and performance of the firm.

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3 METHODOLOGY

3.1 DATA DESCRIPTION

This study uses panel data of 830 firms from various Asian countries including Thailand, Malaysia, Japan, China, India, Singapore, Indonesia, and Pakistan. Data was collected from Thomson Routers®. Table 2 shows the number of firms used in this study.

Table 2: Description of Sample Size

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
China	122	133	143	153	154	154	154	156	158	158	158	158
India	102	111	119	127	128	129	129	130	131	132	132	132
Japan	95	104	111	119	120	120	120	122	123	123	123	123
Thailand	81	89	95	102	103	103	103	104	105	105	105	105
Korea	68	74	79	85	86	86	86	87	88	88	88	88
Malaysia	54	59	63	68	68	69	69	69	70	70	70	70
Indonesia	47	52	55	59	60	60	60	61	61	61	61	61
Pakistan	108	118	127	136	137	137	137	139	140	140	140	140
Total	677	740	792	849	855	857	858	868	876	877	878	877

3.2 VARIABLES

Many factors related to firm-specific characteristics and risks have been identified to influence the equity cost (Hasan *et al.*, 2015). To calculate the cost of equity, many studies use the price-earnings ratio, and CAPM (capital asset pricing model) (Gray & Ariss, 1985). This study, variables include beta, firm size, and book to market ratio (BM), loss, Z-score, and capital structure (CLC). According to Sharpe (1964) and Botosan (1997), there is a direct relationship between the beta and the equity cost capital; this makes beta a very good proxy for equity cost estimation. Second, size is believed that the bigger or larger the size, the lesser are the chances of default (Berger & Udell, 1995), and a negative correlation of the size and the stock returns (Fama & French, 2001). This paper uses a natural log of the total amount of assets to calculate the firm's size. Third, the growth of the firm is estimated using the book to market value ratio. A direct relationship exists between the book to market ratio and the cost of equity (Fama & French, 2001). Loss is associated with business risk and a firm with a record of losses over a period will influence the decision of the investors and eventually increase the cost of equity. Risk arises in the form of leverage, a highly levered firm will have greater risk and will be perceived as the one with a higher equity cost capital (Gebhardt *et al.*, 2001). The last variable, the probability of bankruptcy, Altman's Z-score measures the bankruptcy, an unsystematic factor of the risk.

3.3 ECONOMETRIC MODEL

This study scrutinizes the link between equity cost capital and the FLC stage. Sometimes, endogeneity can be an issue while examining the association between a firm's life cycle and equity cost (Yosinski *et al.*, 2015). endogeneity will cause doubts on the reliability of findings (Reeb *et al.*, 2012). The generalized method of moment (GMM) model reduces the endogeneity (Munisi & Randøy, 2013). In comparison to pool and panel models, the GMM estimator is designed for data where the period is small, the dependent variables depend upon its past realizations, and there exists heteroscedasticity along with autocorrelation.

This study regression model is

$$R_{i,t} = \alpha_0 + \beta_1 CLC_{i,t} + \beta_2 SIZE_{i,t} + BM_{i,t} + \beta_4 BETA_{i,t} + \beta_5 LOSS_{i,t-1} + \beta_6 LEV_{i,t} + \beta_7 ZSCORE_{i,t} + \varepsilon_{i,t} \quad (1),$$

$$Y_{it} = \delta y_{i.t-1} + X'_{i,t} + \mu_{it} \quad (2).$$

R implied cost of equity average of all, CLC is firm life cycle (FLC), BM book to market ratio. The regression coefficients β_1, β_2, β_3, β_4, β_5, β_6, β_7, regression intercept α_0, and regression error ε are estimated from the model. For subscripts, i represents the firms and t is the time-series dimension of the panel data. Y_{it} is the dependent variable vector and $X'_{i,t}$ is the explanatory variables measuring the parameter vector. $\mu_{it}$is the error vector term. $\delta y_{i.t-1}$ is constant/intercepts.

4 RESULTS AND DISCUSSION

This section discusses the sample statistics, correlation analysis, pre-diagnostics of using the generalized method of moment (GMM), and mainly the regression results under the two-step system (GMM) methodology.

4.1 PRELIMINARY ANALYSIS

Table 3, the growth stage firms are highest in number followed by maturity. However, the study finds almost equal numbers of firms in introductory & shakeout stages and the declining stage represents the lowest number in the data sample. The overall data sample also increases as the numbers of firms increase yearly. The study also finds significant changes in number and ratios yearly. Table 4 is based on each stage of the firm's life cycle.

Table 3: Sample Division Based on FLC

Year	Introductory		Growth		Maturity		Shakeout		Declining	
	Number	%age	Number	%age	Number	%age	Number	%age	Number	%age
2006	154	23.720	179	27.560	169	25.960	70	10.740	105	16.190
2007	143	20.100	183	25.820	160	22.590	139	19.510	115	16.140
2008	147	19.320	173	22.750	170	22.340	198	26.040	104	13.710
2009	158	19.450	194	23.800	193	23.680	191	23.420	113	13.820
2010	173	21.060	204	24.860	161	19.670	179	21.820	138	16.750
2011	179	21.770	197	23.920	151	18.350	194	23.540	136	16.580
2012	182	22.090	185	22.480	157	19.060	174	21.080	160	19.450
2013	179	21.480	207	24.850	160	19.240	149	17.860	173	20.730
2014	160	19.070	214	25.400	176	20.940	175	20.810	151	17.960
2015	155	18.440	201	23.880	195	23.140	176	20.910	150	17.810
2016	171	20.260	206	24.470	183	21.750	167	19.770	151	17.920
2017	179	21.280	199	23.630	185	22.020	169	20.040	145	17.200
Overall	1980		2342		2060		1981		1641	

The study uses four different measures of equity cost and the results of four different models are presented in Table 5. The retained earnings are the negative determinant of equity cost in Asia. As high retained earnings are an outcome of earlier profit, it is a justified proxy for a firm's life cycle (De Jonghe & Öztekin, 2015). Such firms are not exposed to higher external financing which is in line with earlier findings of Deangelo *et al*. (2006). The level of significance varies from 1% to 5% for

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models 3 and 4, but still, the coefficient is negative, suggesting the significance of retained earnings in determining equity cost. As far as the other variables are concerned, the results show the bigger firms also have less equity cost because size negatively impacts equity cost in Asia in line with earlier findings of Francis et al. (2005). The bigger firms are less exposed to financial constraint and their market access enables them to have less equity cost.

Table 4: Descriptive Statistics of all FLC Stages.

Variables	Statistics	Introduction	Growth	Maturity	Shake-out	Decline
Retained earnings	Mean	.304	.053	.812	-.004	.024
	Median	.278	.084	.778	-.088	.326
	SD	.599	.257	.317	.391	.791
Firm size	Mean	20.526	21.775	21.716	21.669	20.652
	Median	20.469	21.659	21.603	21.557	20.729
	SD	1.607	1.710	1.861	1.872	1.987
Market to book value	Mean	.842	.848	.850	.090	1.084
	Median	.720	.709	.785	.068	.065
	SD	1.012	.923	.984	1.076	1.346
Firm risk	Mean	1.254	1.063	.973	1.013	1.549
	Median	1.155	.965	.878	.897	1.364
	SD	1.100	.833	.772	.936	1.091
$Loss_{(t-1)}$	Mean	.445	.106	.050	.170	.442
	Median	.000	.000	.000	.000	.000
	SD	.536	.322	.228	.395	.539
Financial leverage	Mean	.750	.691	.422	.513	.608
	Median	.511	.565	.380	.470	.550
	SD	.866	.632	.577	.625	.942
Z-score	Mean	3.779	3.612	4.775	4.169	4.101
	Median	2.129	2.803	3.512	1.888	.751
	SD	6.158	3.582	4.369	4.879	7.908

Table 5: Determinants of the Equity Cost.

Variables	Model 1 Easton (2004) R PEG		Model 2 Easton (2004) R MPEG		Model 3 OJ (2005) R OJ		Model 4 Average of the first three models	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Intercept	.415***	.000	.364***	.000	.377***	.000	.392***	.000
Retained earnings	-.058**	.042	-.051**	.010	-.034***	.000	-.056***	.002
Firm SIZE	-.032***	.002	-.011**	.021	-.011**	.056	-.011**	.015
Market to book value	.032**	.044	.041**	.015	.040**	.023	.037**	.011
BETA	.009*	.065	.010*	.076	.010*	.090	.005**	.023
LOSSt-1	.027	.953	.011	.076	.011	.064	.020	.445
LEV	.013***	.000	.017***	.000	.015***	.000	.017***	.000
Z-score	-.003**	.021	-.004**	.043	-.003**	.056	-.004***	.044
Year Dummy	Yes		Yes		Yes		Yes	
Country dummy	Yes		Yes		Yes		Yes	
Diagnostic tests								
J statistic(P- value)	.795		.374		.457		.457	
Lag (2) Serial correlation(P-value)	.286		.317		.253		.253	
Durbin–Hausman test (P value)	.451		.229		.278		.278	

OJ(2005) refers to Ohlson, & Juettner-Nauroth (2005); R PEG= price earnings growth ratio model;
R MPEG= the modified price earnings growth ratio model; R OJ= the economy wide growth model of OJ(2005).
***p < .01, ** p < .05, * p < .10

The firms with a high level of market value are exposed to high equity cost (Witmer & Zorn 2007). This may be because the market to book value of the firm is highly correlated with a dividend payout of the firm; this may be a cause of a positive association between market to book value and equity cost. These findings are in line with earlier findings of DeAngelo *et al*., (2006) and Fama and French (2001). Beta is a measure of firm risk which is positively associated with equity cost; however, the level of significance is comparatively 5% and 10%. Higher beta value shows the riskiness of firms operating in the market; thus. Higher equity cost is expected in firms with more risk. This is in line with earlier findings of (Coulton & Ruddock, 2011). This show that firm with higher market risk faces more equity cost (Fama & French, 2001). Also, the study considered last year's loss and it has insignificance association with equity cost. However, the financial leverage positively and significant determinant of equity cost in case of all the four measures of equity cost. The firm's leverage ratio also varies across stages and higher levered firms have limited access to finance. This ultimately increases the equity cost capital.

4.2 MAIN FINDINGS

This study also highlights the determinants of equity cost based on life cycle stages following Dickinson (2011).

Table 6: Determinants of Equity Cost during FLC Stages

Variables	Stage 1 Introduction		Stage 2 Growth		Stage 3 Maturity		Stage 4 Declining	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Intercept	.011**	.023	.387**	.032	.401***	.000	.017**	.012
Retained earnings	.003	.159	-.054**	.000	-.036***	.000	-.060	.423
Firm SIZE	-.008**	.022	-.012**	.023	-.072***	.010	-.012**	.039
Market to book value	-.054*	.077	-.172***	.001	-.043**	.024	-.046	.154
BETA	.001*	.070	.016**	.081	.011**	.016	.005***	.002
LOSSt-1	.076**	.015	.011*	.081	.011*	.068	.022***	.007
LEV	.039***	.000	.048***	.000	.046***	.000	.018***	.009
Z-score	-.013**	.022	-.004**	.046	-.053**	.059	-.004**	.013
Year Dummy	Yes		Yes		Yes		Yes	
Industry dummy	Yes		Yes		Yes		Yes	
Country dummy	Yes		Yes		Yes		Yes	
Diagnostic tests								
J statistic(P- value)	.846		.398		.486		.516	
Lag (2) Serial correlation(P-value)	.305		.338		.270		.319	
Durbin–Hausman test (P value)	.481		.244		.296		.307	

***p < .01, ** p < .05, * p < .10

4.2.1 IMPACT OF COST OF THE EQUITY DURING DIFFERENT LIFE CYCLE STAGES

This study tests the impacts of different stages on equity cost, see results in Table 7. The study uses retained earnings as a proxy of the life cycle and four stages dummies are included. As the major concern is the impacts of different life cycle stages, the study discusses only stages impacts of different life cycle stages on firm equity cost.

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Table 7: Impacts of FLC on Equity Cost

Variables	Model 1		Model 2		Model 3		Model 4	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Intercept	.152***	.000	.123**	.000	.117***	.000	.067**	.058
Introduction dummy	.025***	.000	.090***	.000	.086***	.000	.086***	.000
Growth dummy	-.065**	.034	-.090**	.044	-.070**	.056	-.029**	.024
Maturity dummy	-.162***	.000	-.241***	.000	-.202***	.000	-.159***	.000
Declining dummy	.065*	.077	.018*	.662	.088*	.062	.162*	.081
Firm SIZE	.076***	.000	.009***	.000	.052***	.000	.017***	.000
Market to book value	.057**	.042	.014**	.033	.046**	.022	.028**	.016
BETA	.033*	.066	.034**	.065	.053**	.052	.045**	.054
LOSSt-1	.065*	.090	.001*	.065	.065*	.089	.028*	.067
LEV	.009	.000	.019	.000	.017	.000	.019	.010
Z-score	-.014	.024	-.004	.048	-.003	.063	-.005	-.014
Year Dummy	Yes		Yes		Yes		Yes	
Country dummy	Yes		Yes		Yes		Yes	
Diagnostic tests								
J statistic(P- value)	.619		.333		.407		.432	
Lag (2) Serial correlation (P-value)	.255		.283		.226		.267	
Durbin–Hausman test (P-value)	.423		.204		.248		.257	

***p < .01, ** p < .05, * p < .10

Using all four models of measure met of equity cost, the results show that introduction and declining stages are positive determinants of equity cost in all four models. The firms in the introduction stage have more financial constraints and limited access to the debt and equity market due to visibility criteria as well, this exposes the firm to high financial risk options which ultimately increase equity cost (Bulan et al., 2007; Coulton & Ruddock, 2011). Similarly, the declining stage makes the firm more vulnerable in the market and investors are less likely to invest in these firms in line with earlier findings (DeAngelo *et al.*, 2006; Fama & French, 2001). Ultimately, this increases the equity cost. However, the results of growth and maturity are in line with our prediction that firms in growth and maturity phases are likely to receive investments in chucks because they are in the portfolio of long and short-term investors. The level of significance is quite higher in the case of the maturity stage that is in line with the life cycle hypothesis. The results of the control factors are in line with earlier hypotheses.

5 CONCLUSION

This study tests the explanatory power of the dynamic resource-based view and life cycle theory for equity cost in the Asian context. This study considers four stages of a firm's life cycle and excludes the shakeout stage as it is the mix of other stages. The results posit that the firms in different stages of their life cycle possess diverse levels of resource-based, competitive advantages, information asymmetry, and riskiness. Resultantly, the equity cost of each firm varies across its different life cycle stages. Using a sample of Asian firms for 2007-2017, the results strongly support that equity cost capital varies across different stages significantly. Precisely, the study highlights the equity cost of the firms is higher in the introduction stage, while growth and maturity negatively impacts it. At the same time, the results are not affected by different estimations of the equity cost. The study also highlights the determinants of equity cost stage-wise and finds a significance difference in determinants of equity cost at each stage. Lastly, this study also regressed the stage

dummy for all four measures of equity cost and finds the introduction stage as significant positive determinants of equity cost. This is in line with the resource-based view. The other two stages negatively impact equity cost; suggesting that firms in their growth and maturity stages are less exposed to financial constraints and have lower equity costs. The results of the declining stage show insignificant association, however, the coefficient value remains negative. These competitive advantages help firms to lessen the risk and problems related to the information asymmetry, and to have easy access to finance that ultimately reduces the equity cost capital. Finally, the findings have direct implications for the strategic direction of the firm and firms are the firms that are advised to maintain maturity as the prime stage of the FLC, to benefit from resource-based views and the lower equity cost. The results favor the growth and maturity stages of the firm because the firm has less equity cost during these two stages

6 AVAILABILITY OF DATA AND MATERIAL

The corresponding author will be liable to provide information regarding this paper.

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