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Do Remittance Outflow and Exchange Rate Wavering Distress Domestic Private Investment in ASEAN? A Conceptual Panel Cointegration

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ABSTRACT

The need for private investment is located in both developing and developed world economies. In this regard, Association of Southeast Asian Nations are always seen where the private investment is well hosted and is found to increase in ready course of time. However, the needs and requirements for private investment have changed drastically in the growing world of today where the race is to fetch economic growth and development at the back of sound and consistent flow of private investment. This research paper states the current scenario of private investment in the ASEAN and suggests for the tackle of its modules such as worker remittance and their outflow as well as exchange rate wavering to affect nature of private investment. Being conceptual in nature, empirical and theoretical views are highlighted together with the panel data analyses for conduction of regression results.

1. Introduction

Since the global financial crisis, the decline in private fixed investment, followed by only a negligible recovery, has been attributed to weak economic activity, financial retrenchment, and policy uncertainty; therefore, these constraints must be addressed to restore investment. One recommendation is to encourage firms to maintain persistent capital spending. Despite a 25 per cent decline in private investment in advanced economies, investment in developing economies also weakened from the mid-2000s onwards (International Monetary Fund [IMF], 2015).

Expectations concerning firm profitability and business continuity become uncertain when the investment climate is clouded by perceptions of deteriorating future macroeconomic conditions (Guimaraes & Unteroberdoerster, 2006). Therefore, such expectations must be examined carefully, while corporate-level profitability should be supported to sustain private investment. Private investment also tends to slow when the

public sector is hesitant or lacks sufficient resources to complement it. Consequently, the public sector's provision of essential services is important for strengthening private-sector confidence and maintaining an uninterrupted flow of investment capital (Hassan, Othman, & Karim, 2011).

An examination of Southeast Asia, particularly with regard to overseas investment, raises the question of whether international investment flows and economic growth follow comparable patterns across the countries in the regional bloc. Although the average economic growth rate of 5.4 per cent among the Association of Southeast Asian Nations (ASEAN) over the previous two decades appears attractive as a model for other developing economies, the benefits of such growth have not been distributed equally across countries facing common economic constraints. In addition, foreign direct investment (FDI) flows to the region exceeded those to China by 2013, while ASEAN's share of FDI in developing countries increased from approximately 7 per cent in the mid-1980s to 20 per cent by 2012 (Organisation for Economic Co-operation and Development [OECD], 2014). However, from the investors' perspective, ASEAN must establish mechanisms that facilitate business activity, support the movement of investment within the region, and narrow regional development gaps.

Employment generation is an important outcome of investment (Keynes, 1936). Investment in ASEAN, including the substantial participation of United States-affiliated firms, benefits local economies by creating employment opportunities (OECD, 2014). In addition, investors' choices regarding business locations are likely to depend on market size and the capacity to export finished products. Table 1 presents the foreign workforce reported for the selected ASEAN economies and indicates a combined total of 6.71 million workers.

Table 1

Foreign Workforce in Selected ASEAN Economies

Country	Total Foreign Workforce (millions)
Singapore	1.30
Thailand	2.87
Malaysia	2.30
Indonesia	0.10
Philippines	0.14
ASEAN5	**6.71**

Source: ILO Regional Office for Asia and the Pacific, the World Bank, Paul Hype Page & Co., and ABS-CBN News. The reference year for each database is 2019.

According to the available ease-of-doing-business indicators, Singapore is investors' first choice among the selected ASEAN economies, followed by Malaysia, Thailand, and Indonesia. Differences in macroeconomic conditions and institutional arrangements distinguish ASEAN countries when investors determine where to allocate their funds. In particular, Singapore's favourable business environment contributes to its attractiveness to

investors. Table 2 similarly shows that Singapore and Malaysia achieved the highest scores among the selected ASEAN countries, whereas Myanmar recorded the lowest score.

Table 2

Ease-Of-Doing-Business Scores In Selected Asean Economies

Country	Score (2018)	Score (2019)
Singapore	84.97	85.24
Malaysia	78.3	80.60
Thailand	77.39	78.45
Indonesia	66.54	67.96
Myanmar	44.21	44.72

Source: World Bank Group, Doing Business fact sheet for Asia and the Pacific (2019).

The basic accelerator model suggests that economic growth positively affects both public and private investment. Therefore, the model provides a basis for examining the importance of macroeconomic conditions and their effects on private investment, as well as the reciprocal effects of investment on other economic indicators. Similarly, upward or downward movements in foreign investment may influence job creation and the balance of payments. However, it is important to distinguish whether the resulting employment is obtained by local or migrant workers. Previous research has mainly explored the effect of workers' remittance inflows on private investment in the recipient country. In contrast, the possible effect of remittance outflows on private investment in the migrant-host country remains insufficiently examined.

This study is motivated by Keynes's (1936) theory of employment, interest, and money, which links employment to sustained investment and consumption. Accordingly, when migrant workers remit a substantial proportion of their earnings to their countries of origin and retain less income in the host economy, domestic liquidity and demand for locally produced goods may decline. Since domestic demand is an important stimulus for investment, remittance outflows may consequently weaken private investment in the host country. In addition, exchange-rate fluctuations are a key determinant of investors' expectations regarding future business conditions and the implementation of plans intended to increase profits and market share (Dixit & Pindyck, 1994; Rodrik, 1991). Therefore, empirical analysis is required to examine these dynamics and to identify policy measures that can support a stable flow of private investment within the region.

2. Literature Review

2.1 Empirical Review

A substantial body of research has examined the effects of public investment on private investment, and many studies report a positive relationship between the two (Ahmed & Miller, 2000; Akkina & Celebi, 2002). However, findings vary by methodology and sample. Erden and Holcombe (2005), for example, applied two-stage least squares, whereas Bende-Nabende and Slater (2003) used panel cointegration. For ASEAN countries from 1965–1999,

Bende-Nabende and Slater (2003) identified a negative association between public and private investment. In addition, relatively few researchers have examined industry-specific interactions between public and private investment within individual countries (Hassan et al., 2011; Zugasti, García, & Maldonado, 2001).

Research analysing private investment commonly begins with the conceptual framework of neoclassical investment theory. Cross-country and country-specific studies identify output growth, financial conditions, public investment, credit availability, and macroeconomic stability as central determinants of private investment (Ghura & Goodwin, 2000; Greene & Villanueva, 1991; Kannapiran, 2001; Oshikoya, 1994). Similarly, evidence from China and OECD economies emphasises the importance of economic fundamentals and financing conditions (Haiyan, Zinan, & Ping, 2001; Pelgrin, Sebastian, & Serres, 2002). Financial development can be measured through private-sector credit relative to GDP and stock-market capitalisation relative to GDP, while the exchange rate is also an important determinant of investment (IMF, 2015). Therefore, these macroeconomic variables should be considered when evaluating domestic private investment.

FDI, as a component of private foreign investment, is sensitive to the host country's policies and institutional conditions, including taxation and liberalisation. Multinational firms establish business operations to supply products and secure competitive advantages (Banga, 2013); however, they are more likely to expand when the host country adopts a liberal approach to FDI. Cross-border investment decisions are similarly influenced by the wider policy and economic environment (Mehmood & Faridi, 2013b). In addition, economies that promote privatisation may encourage economic growth, as measured by increases in GDP (Mehmood & Faridi, 2013a). Therefore, FDI has the potential to support economic growth (Mehmood & Hassan, 2015).

In a related context, Duggan, Rahardja, and Varela (2013), using an FDI index, reported an 8 per cent increase in the total factor productivity of Indonesian manufacturers following service-sector liberalisation for FDI. Private investment may also progress more effectively when the legal systems of countries within a regional bloc are based on common principles. Such legal harmonisation reduces transaction costs for foreign investors operating across the region (Darsa, 2012; Wong, 2013).

The contribution of the private sector extends beyond job creation. In the ASEAN context, United States-affiliated firms employ substantial numbers of workers in host economies (OECD, 2014). In addition, the private sector generates income that migrant workers may remit to their countries of origin, thereby linking labour mobility, remittance flows, and host-country economic activity. Rahman (2015), using the Johansen cointegration technique, found long-run relationships among workers' remittances, economic growth, and private investment.

Similarly, Okodua (2015) analysed the effect of workers' remittances on private investment by estimating a linear dynamic panel model through the generalised method of moments. Migrant income has multidimensional economic effects; therefore, a positive relationship between remittances and private investment may also support improvements in other macroeconomic conditions, including poverty reduction (Faridi & Mehmood, 2014). Extending this discussion and drawing on Fry's (1998) flexible accelerator model, Khatib,

Altaleb, and Alokor (2012) examined the macroeconomic determinants of gross domestic investment in Jordan. They found that GDP and exports made positive and significant contributions to domestic investment, while FDI was also significant, although its effect was comparatively weaker.

The development of the domestic financial sector and human capital also contributes positively to gross domestic investment. In addition, annual changes in the exchange rate may be used as a proxy for macroeconomic instability. Mavrotas (1997), followed by Naqvi (2002), showed that real exchange-rate fluctuations and the associated uncertainty negatively affected private investment. Similar findings were reported by Dixit and Pindyck (1994), Hubbard (1994), Rodrik (1991), Servén (1999), and Solimano (1989). Therefore, exchange-rate uncertainty is expected to influence both the timing and scale of private investment decisions.

2.2 Theoretical Review

2.2.1 The Marginal Efficiency of Capital: Keynes and Fisher

Eklund (2013) reviewed the contributions of Keynes and Fisher and argued that investment decisions depend on the present value of expected future revenues. When the opportunity cost of capital equals the expected return, the net present value becomes zero and the investment decision reaches its threshold. Future cash flow, denoted by C(t), is generated after the investment activity takes place. Therefore, net present value can be expressed as shown in Eq. [1].

$$NPV = -K_0 + \int_0^{\infty} C(t)e^{(g-r)t}dt \qquad [1]$$

Here, g denotes the growth rate, while r denotes the discount rate or opportunity cost of capital. When r equals i, net present value is zero. The present value of investment is written as C1/(r − g), implying that PV/I = 1. According to Keynes and Fisher, the marginal efficiency of capital and the internal rate of return, respectively, are represented by i, which denotes the return on investment. Baddeley (2003) explained that, in the Keynesian framework, investment continues as long as the marginal efficiency of capital exceeds the prevailing interest rate. Therefore, net present value becomes a principal determinant of investment decisions. However, Keynes also emphasised that such decisions are influenced by irrational and volatile expectations, particularly in unstable economies.

2.2.2 Investment through the Neoclassical Perspective

Neoclassical economists regard a firm's investment decision as an optimisation problem. According to Jorgenson (1963, 1967, 1971), a business firm seeks to optimise its capital stock after maximising profit over a specified period. Therefore, the conventional Cobb–Douglas production function may be written as shown in Eq. [2].

$Y(t) = f(K, L)$, which equals $AK^{\alpha}L^{1-\alpha}$ [2]

The firm's profit function is subsequently expressed in Eq. [3].

$$\lambda(t) = \phi(t)Y(t) - \partial(t)I(t) - \chi(t)L(t) \qquad [3]$$

Profit is obtained after the costs of capital and labour have been accounted for. Therefore, the current value of the firm is derived as shown in Eq. [4].

$$V_0 = \max imizing E_{\Phi} \int_0^{\infty} \eta(t) e^{-rt} dt = E_{\Phi} \int_0^{\infty} \left[\phi(t) Y(t) - \partial(t) I(t) - \chi(t) L(t) e^{-rt} dt \right] \quad [4]$$

The term E denotes the expectations operator, conditional on the relevant information set.

After adjustment through the Lagrangian procedure, the expression is obtained as shown in Eq. [5].

$$L = \int_0^{\infty} \left[\phi(t) Y(t) - \partial(t) I(t) - \chi(t) L(t) + \lambda (I - \delta K) - \lambda \dot{K} \right] e^{-rt} dt \quad [5]$$

In addition, the opportunity cost of invested capital must equal the shadow price. Therefore, Eq. [6] can be written as follows:

$$\frac{\delta H}{\delta \lambda} = \frac{\delta K}{\delta t} = I - \varphi K = zero \quad [6]$$

This condition implies zero net investment at equilibrium, where capital depreciation is equal to gross investment; therefore, Eq. [7] is obtained.

$$\frac{\delta H}{\delta \lambda} = \phi f'_K - \lambda \delta = zero \quad [7]$$

Returning to the Cobb–Douglas production function and incorporating the technology factor, the marginal product of capital, multiplied by the relevant output price, is expressed in Eq. [8].

$$\frac{\delta H}{\delta K} = \phi \frac{\alpha Y}{K} = c \quad [8]$$

Solving for K yields the optimal stock of capital presented in Eq. [9].

$$K^* = \frac{\phi \alpha Y}{c} \quad [9]$$

Therefore, the optimal stock of capital depends on output, the price of output, and the cost of capital.

2.2.3 Accelerator Theory

Clark (1917) introduced the accelerator principle, while Samuelson (1939a, 1939b) subsequently developed and popularised its application. A central assumption of this model is that prices remain fixed. Therefore, when prices are treated as approximately constant, the s and r variables in Jorgenson's (1963) framework are reduced to the relationship presented in Eq. [10].

$$K^* = \alpha Y \quad [10]$$

Equation [11] presents the central proposition that investment in any period depends on the growth of output.

$$I = \alpha \dot{Y} \quad [11]$$

However, investment at each stage of production also depends on the price of output. In addition, input costs and the interest rate, which are recognised determinants of the cost of capital, influence the level of investment. The adjustment of the capital stock is simultaneously assumed to be complete and instantaneous. By incorporating the concept of the desired capital stock, accelerator theory consequently becomes closely related to neoclassical investment theory (Eisner & Nadiri, 1968).

Furthermore, the accelerator principle is consistent with the Keynesian approach to investment determination. However, Keynes questioned the assumption that an adjusted equilibrium can be reached because business expectations continually change. Consequently, there is no permanent point of stability for future investment. Therefore, capital stock alone cannot be regarded as the ultimate determinant of investment, particularly private-sector investment.

3. Methodological Issues

Panel data are also described as longitudinal or cross-sectional time-series data because they contain observations for the same units over different periods (Kennedy, 2008). When panel data are examined for individual effects, time effects, or both, these characteristics may be analysed through fixed-effects or random-effects models. Researchers are increasingly interested in panel-data modelling because of the greater availability of longitudinal data and its capacity to capture variation that cannot be observed through cross-sectional or time-series data alone. However, panel-data modelling requires careful treatment of data structure, model selection, and the interpretation of estimated results.

3.1 Types of Panel Data

Panel data consist of n entities, with each entity containing T observations measured over time t. Therefore, the structure and completeness of the data must be examined carefully before estimation. Panel datasets may be classified as long or short, balanced or unbalanced, and fixed or rotating.

3.1.1 Long and Short Panel Data

A long panel contains a large number of time periods (T) but relatively few entities (n), whereas a short panel contains many entities and comparatively few time periods (Cameron & Trivedi, 2009). Similarly, a short panel is wide in its cross-sectional dimension but limited in time, while a long panel is narrower across entities but extends over a longer period. Therefore, researchers must consider both dimensions when selecting appropriate methods for empirical analysis.

3.1.2 Balanced and Unbalanced Panel Data

When entities in a dataset have different numbers of observations, the panel is considered unbalanced. Consequently, some entity-period cells are missing, and the total number of observations is lower than nT. In contrast, a balanced panel contains observations for every entity in every time period. Therefore, each entity-period cell has one observation, and the total number of observations equals nT.

3.1.3 Rotating and Fixed Panels

If the set of individuals varies from one period to another, the dataset is described as a rotating panel. However, when the same entities are observed in every period, the dataset is known as a fixed panel (Greene, 2008).

3.2 Quality of Panel Data

The quality of panel data depends on systematic data cleaning and consistent organisation of the cross-sectional and time-series dimensions. An inappropriate arrangement may undermine the panel structure and produce results without clear econometric meaning. Therefore, researchers handling panel data should apply several checks derived from established panel-data guidance (Greene, 2008; Kennedy, 2008):

1. To determine whether the longitudinal data contain fixed effects, random effects, or both.
2. To verify that entities and observational units are consistent across the dataset.
3. To confirm that time periods are consistently defined and ordered. For example, annual or weekly observations must represent comparable intervals throughout the dataset.
4. To identify whether more than one observation has been recorded for an entity within the same time period.
5. To apply a consistent method of measurement. Observations are not comparable when some entities are measured by one method and others by another; therefore, avoid mixed measurement procedures to ensure interpretable and reliable results.

3.3 Basic Models for Regression Estimation

Panel-data models may account for individual effects, time effects, or both. These effects are commonly represented through fixed-effects or random-effects specifications. Fixed-effects models examine whether intercepts vary across groups or time periods, whereas random-effects models represent individual or time-specific differences through the variance structure of the composite error term.

3.3.1 Pooled Ordinary Least Squares

Greene (2008) stated that when individual effects (u_i) are absent, such that $u_i = 0$, ordinary least squares (OLS) produces consistent parameter estimates. The functional form is presented in Eq. [12].

$$y_{it} = \alpha + X'_{it}\beta + \varepsilon_{it} \quad [12]$$

where $u_i = 0$.

According to Greene (2008) and Kennedy (2008), OLS is based on five core assumptions, which are described as follows:

1. The linearity assumption requires the dependent variable to be specified as a linear function of the independent variables and the error term.
2. The exogeneity assumption requires the expected value of the error term to be uncorrelated with each regressor in the model.

3. The disturbances should have constant variance (homoscedasticity) and should not be correlated with one another (no autocorrelation).
4. The observations for each independent variable are treated as non-stochastic and fixed across repeated samples; in addition, they should be measured without error.
5. The full-rank assumption requires the absence of an exact linear relationship among the independent variables. Therefore, the regressors should not exhibit perfect multicollinearity.

When individual effects are present in longitudinal data, heterogeneity may affect the exogeneity and disturbance assumptions. In addition, variation in the error variance across individuals produces heteroscedasticity and violates the constant-variance assumption. If individual effects are correlated with the regressors, random-effects estimates become biased. Consequently, pooled OLS can no longer be regarded as unbiased or consistent for the specified panel relationship.

3.3.2 Fixed Effects versus Random Effects

A central difference between fixed-effects and random-effects models concerns the treatment of unobserved individual heterogeneity. In a fixed-effects model, entity- or time-specific intercepts may be represented by dummy variables. In contrast, a random-effects model treats the unobserved effect as part of the composite disturbance term. However, both specifications commonly assume that slope coefficients remain constant across groups and time periods. Their functional forms are presented in Eqs. [13] and [14].

Random-effects model: $y_{it} = \alpha + X'_{it}\beta + (u_i + v_{it})$ [13]

Fixed-effects model: $y_{it} = (\alpha + u_i) + X'_{it}\beta + v_{it}$ [14]

The term u_i represents an individual-specific fixed or random effect associated with a group or time period. In the fixed-effects specification, u_i may be correlated with the regressors and is absorbed into the entity-specific intercept. Therefore, the model can be estimated through least-squares dummy-variable regression or an equivalent within transformation. In contrast, the random-effects model requires the individual effect to be uncorrelated with the explanatory variables; its disturbances are also assumed to satisfy the relevant distributional conditions.

The presence of random effects may be examined using the Lagrange multiplier test developed by Breusch and Pagan (1980), while an F test may be used to assess fixed effects. If the null hypothesis is not rejected in either test, pooled OLS may be selected for estimation. In addition, the Hausman (1978) specification test compares fixed-effects and random-effects estimates. If the null hypothesis that individual effects are uncorrelated with the regressors is not rejected, the random-effects model is generally preferred; otherwise, the fixed-effects model is more appropriate.

4. Conclusion

The continuing competition among developing and developed economies indicates that economic growth and development targets cannot be achieved without sustained investment and the efficient use of productive resources. In this regard, private-sector investment plays

a central role because it supports the productive allocation of available resources, expands economic activity, and contributes to improvements in gross domestic product. However, private investment is sensitive to macroeconomic conditions, institutional arrangements, expectations, and the availability of domestic finance (Ghura & Goodwin, 2000; Greene & Villanueva, 1991).

Furthermore, investment requirements and the business environment have changed considerably. Remittance outflows may reduce income retained and spent in migrant-host economies, affecting domestic liquidity, demand, and incentives for private investment. Similarly, exchange-rate fluctuations may alter prices, production costs, expected returns, and investor confidence (Dixit & Pindyck, 1994; Servén, 1999). Therefore, ASEAN economies require a stable, supportive platform for private-sector investment, along with policies that manage exchange-rate uncertainty and the domestic effects of remittance outflows, so national growth and development objectives can be pursued without undermining the legitimate movement of migrant earnings.

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