DISSERTATION

THREE ESSAYS ON DIFFERENT NATURE AND EFFECTS OF CAPITAL FLOWS AMONG ASIAN AND LATIN AMERICAN COUNTRIES

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ABSTRACT

THREE ESSAYS ON DIFFERENT NATURE AND EFFECTS OF CAPITAL FLOWS AMONG ASIAN AND LATIN AMERICAN COUNTRIES

This dissertation contains three essays on the distinct nature and effects of capital flows on Asian and Latin American countries. Chapter I presents a Post-Keynesian open economy model to investigate the possible effects of capital flows on capacity utilization and distribution in Asian and Latin American countries. In the case of Asian countries, capital flows increase labor productivity through spill-over effects. The increase in labor productivity leads to a decrease in wage share of workers from national income which leads to lower prices. Lower price level results in real exchange rate depreciation and provides higher trade balances through enhanced competitiveness of export goods. In the case of Latin American countries, capital flows result in real exchange rate appreciation in the absence of capital controls. This real exchange rate appreciation decreases the cost of foreign borrowing, foreign intermediate goods and lower wage shares. In line with all these developments, capacity utilization increases, but trade balances deteriorate due to diminished export competitiveness.

Chapter II addresses different dependent relations that lead divergent paths of Asian and Latin American countries toward globalization. Nature of dependency is detected through different types of shocks to current account balances. It is found that Latin American countries are dependent on center countries financially while Asian countries are dependent on world demand for their export goods. This divergent nature of dependent relations shape the nature of foreign capital that invests in these countries. Foreign investments in Latin American countries are

domestic market oriented and for financing needs. These investments do not have future export revenue potentials and reproduces the dependency on international financial markets. Employment of capital controls and high structural domestic savings allowed Asian countries to be more selective in channeling foreign capital. They employed foreign investments to enhance export competitiveness. However, the export oriented path of development tied their economies to pattern of world trade and produced a divergent dependent relationship.

Chapter III tests the dynamic relationship between capital flows, real exchange rate appreciation and trade balances in Latin American and Asian countries. The analysis suggests structural differences between Asian and Latin American countries. Different integration strategies followed in the era of globalization period led to distinct patterns in relation between capital flows and trade balances. In order to test the relationship, Panel Vector of Autoregression analysis and orthogonalized import response functions are employed. It is found that foreign capital flows affect trade balances negatively in Latin American countries. In the case of Asian countries, a positive relationship between capital flows and trade balances is detected, however this relationship is not statistically significant.

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CHAPTER I

CAPITAL FLOWS, REAL EXCHANGE RATE APPRECIATION AND INCOME DISTRIBUTION IN AN OPEN ECONOMY POST-KEYNESIAN MODEL OF DISTRIBUTION AND GROWTH

1.1 Introduction

This work presents an open economy Post-Keynesian model of distribution and growth that captures the effects of the differing nature of capital flows to Latin American and Asian countries specifically income distribution, real exchange rate appreciation and capacity utilization. Latin American and Asian countries followed two different paths toward globalization. While Latin American countries pursued financial and trade liberalizations, Asian countries were more cautious with respect to financial liberalization and followed trade liberalization after a period of protectionism that nurtured industry. These two divergent paths are investigated in detail in Chapter II.

Latin American countries experienced nominal exchange rate appreciation during periods of booms in capital flows under flexible exchange rate regimes, supported by capital account liberalization. The root cause of this is the dependence of domestic absorption on foreign capital flows. An increase in foreign financial flows usually maintains elevated level of domestic absorption and results in excessive demand in non-traded goods. Inevitably, this results in higher price levels in these sectors and nominal and real exchange rate appreciations under a free exchange rate regime. This has important implications for wage share and real exchange rate dynamics in these countries. Outcomes vary by demand regimes (profit-led or wage-led). (Lal,

1985; Calvo et al. 1993, Calvo et al. 1995; Calvo et al. 1996; Athukorala & Rajapatirana, 2003; Blanchard et. al., 2015)

Asian countries were more reluctant to institute capital account liberalization, but applied trade liberalization aggressively after a lengthy period of protectionism. A lower level of wages attracts capital flows not only for financing needs but also for capacity building and export. Consequently, they enhance the productivity levels in these countries and a lower level of productivity depresses wage shares and in turn increases cost competitiveness of the country. In the context of export oriented growth, trade openness leads to a race to the bottom in terms of wages. Export competitiveness erodes workers' bargaining power so that wage share is depressed. Kaldor's analysis of export-led cumulative causation addresses these differences in growth rates among the industrialized countries (Setterfield & Cornwall, 2002; Setterfield, 2002; Blecker, 2009). In this set of countries capital flows affect the dynamic relationship between wage shares and real exchange rate through their effect on labor productivity. An exogenous increase in capital flows, increases the labor productivity and depresses the wage shares. This leads to real exchange rate depreciation under fixed or controlled exchange rate regimes. The outcome for Asian countries is higher trade balances associated with higher capacity utilization under both regimes.

In this work, the distinct relationships between capital flows, income distribution and capacity utilization are analyzed through a Post-Keynesian model, based on two important foundations. First, functional income distribution between wages and profits is the outcome of the mark-up pricing decisions of firms and bargaining power of workers. Second, aggregate demand is primarily determined by functional income distribution (Blecker R. , 2012). The following section presents standard medium-run dynamic relationship between capacity utilization and

wage. Third section presents short-run dynamics between real exchange rate, capital flows and wage share based on the structural differences between Asian and Latin American countries.

1.2 Medium-Run Equilibrium: Wage Share and Capacity Utilization

In this work, it is assumed that dynamics of wage share and capacity utilization determines the medium-run equilibrium of the economy. This dynamic relationship between wage shares and capacity utilization does not change between Latin American and Asian countries. This section introduces the dynamics of capacity utilization and wage share, respectively.

1.2.1 Dynamics of Capital Utilization

The framework of effective demand in this work is adopted from Dutt (1990), Blecker (1989) and Taylor (2004). A one sector open economy is assumed for simplicity and prices in the industrial sector are defined through mark-up on average variable costs. Fixed costs are ignored and foreign prices are equal to unity. The goods market equilibrium prices are determined by;

$$P = (Wb + ea)(1 + \tau) \tag{1.1}$$

In equation (1.1) P, W, b, e, a, τ refers to price level, nominal wages, unit labor requirement of production (inverse of productivity), nominal exchange rate, imported intermediary goods required for one unit of production and gross profit mark-up rate, respectively. Profit share (π) is defined as $\frac{\tau}{1+\tau}$. Prices can be defined in terms of profit share as follow;

$$P = (Wb + ea)\frac{1}{1 - \pi} \tag{1.2}$$

Wage share (ψ) is the total wage payments to workers out of total product (PX) and it is a function of real wages. As productivity increases, wage share tends to decrease. The relationship between real wages and wage shares is shown in equation (1.3).

$$\psi = \frac{WbX}{PX} = \omega b \tag{1.3}$$

Import share (ϕ) is the share of total payments to abroad for intermediary goods in total output and defined in equation (1.4) as the function of real exchange rate $(q = \frac{e}{p})$ and intermediary goods required for one unit of production of final good (a).

$$\phi = \frac{eaX}{PX} = qa \tag{1.4}$$

As shown in equation (1.4) import shares decrease with real exchange rate appreciation[1] while a is determined exogenously by current production technology and is assumed to be constant. Profit share (π) is equal to one minus the sum of wage and import shares. In this case prices can be defined as follow;

$$P = \frac{(Wb + ea)}{\psi + \phi} \tag{1.5}$$

In goods market, prices are determined through wages and exchange rates. Investment is determined by an exogenously given parameter representing animal spirits (g_0), capacity utilization $(u = \frac{X}{K})$ and profit share $(1 - \psi - \phi)$ positively and negatively by net return payments ratio to total outcome (qif) negatively. The variables i and f are net return on foreign capital and foreign capital stock for financing needs, respectively. Investment must be a function of the share of debts that is not reinvested in the economy (Ω). This share is assumed to be high for Latin American countries and low for Asian countries. Capacity utilization reflects the secular trend of growth and reflects the prospect for the profitability of the economy in concert with the profit share (Bhaduri & Marglin, 1990). Net return payments to foreign capital constrain investments through

[1] Exchange rate is illustrated through price quotation system. An increase in exchange rate refers to depreciation and a decrease, appreciation.

reducing the creditworthiness of industrial firms and increasing the risk for solvency of the country. Ndikumana (1999)estimates the importance of foreign debt in the conventional investment equation and finds that foreign debt has direct and negative impact on investment levels. The investment function (g^i) is defined as follows;

$$g^i = \frac{\dot{K}}{K} = \frac{I}{K} = g_0 + g_1 u + g_2(1 - \psi - \phi) - g_3 \Omega i q f \tag{1.6}$$

Savings are the sum of savings of workers and capitalists which are a constant ratio of their income that are shown as s_π and s_w, respectively. The capitalist's marginal propensity to save is assumed to be higher than that of workers. Total savings are defined in equation (1.7).

$$S = s_w \psi X + s_\pi (1 - \psi - \phi) X \tag{1.7}$$

When equation (1.7) is divided by capital stock (K), the saving-capital ratio is as follows;

$$g^s = \frac{S}{K} = \{s_w \psi + s_\pi (1 - \psi - \phi)\} u \tag{1.8}$$

Current account balance (CA) is the difference between exports (EX) and the sum of imports(qaX) and net foreign capital return payments abroad ($q\Omega if$).

$$CA = EX - qaX - i\Omega q f X \tag{1.9}$$

Dividing equation (1.9) by K, it is obtained following;

$$g^c = \frac{CA}{K} = \epsilon(q) - u(qa + i\Omega q f) \tag{1.10}$$

Where g^c is the current account to capital stock ratio and $\epsilon(q)$ is export to capital ratio, a decreasing function of the real exchange rate. Goods market equilibrium is defined as the levels of capacity utilization that makes the sum of g^i and g^c equal to g^s.

$$\Delta = g^i + g^c - g^s = 0 \tag{1.11}$$

The rate of change in capacity utilization can be defined as the function of goods market equilibrium condition when equations (1.6), (1.8) and (1.10) is substituted into equation (1.11).

$$\frac{\dot{u}}{u} = \Gamma(\Delta)$$

$$\frac{\dot{u}}{u} = \Gamma(g^i + g^c - g^s)$$

$$\frac{\dot{u}}{u} = \Gamma(g_0 + g_1 u + g_2(1-\psi-\phi) - g_3 \Omega i q f + \epsilon(q) - u(qa + i\Omega qf) - \{s_w\psi + s_\pi(1-\psi-\phi)\}u) = 0 \quad (1.12)$$

Equation (1.12) illustrates the rate of change in capacity utilization from which an effective demand curve ($\dot{u}(\psi) = 0$) can be derived. The steady state capacity utilization in the medium-run (u_{ss}) can be illustrated as follows;

$$u_{ss} = \frac{g_0 + g_2(1-\psi-\phi) - g_3 i\Omega qf + \epsilon(q)}{\{s_w\psi + s_\pi(1-\psi-\phi)\} + (qa + i\Omega qf) - g_1} \quad (1.13)$$

The slope of the effective demand $\left(\frac{\partial u_{ss}}{\partial \psi}\right)$ is as follow;

$$\frac{\partial u_{ss}}{\partial \psi} = \frac{(s_\pi - s_w)u_{ss} - g_2}{\{s_w\psi + s_\pi(1-\psi-\phi)\} + (qa + i\Omega qf) - g_1} \quad (1.14)$$

Equation (1.14) illustrates the goods market equilibrium from which an effective demand curve ($\dot{u} = 0$) can be derived. The slope of the ($\dot{u} = 0$) curve will determine the demand regime of the economy. The denominator in equation (1.14) must be higher than zero to sustain stability in the short run $\left(\frac{\partial \dot{u}}{\partial \mathrm{u}} < 0\right)$; known as the Keynesian stability condition. Under this condition if $(s_\pi - s_w)u - g_2$ is smaller than zero, the effective demand will be negatively sloped. Negatively sloped demand regimes are named "profit-led" while positively sloped ones are "wage-led". Effective demand can be considered as "wage-led" when positive effects of higher wage shares on consumption exceeds negative effects on investment and trade balances, and as "profit led" when investment is more responsive to profits (Onaran & Galanis, 2013; Blecker, 2016a). Kiefer and Rada (2015) investigate 13 OECD countries based on Goodwin-Cycles and conclude that these countries are weakly profit-led. Blecker (2016b) argues that the results of Kiefer and Rada about

profit-led growth-demand, is more valid only for the short-run, but in longer time periods demand is wage-led. Wage-led and profit led demand regimes are illustrated through $\dot{u} = 0$ curves in Figure 1.1. This work analyzes both two demand regimes.

1.2.2 Wage Share Dynamics

Wage shares are determined through both short-run and medium determinants. In the medium-run capacity utilization and in the short-run, conflicting claims, became partial determinants. An abstract version of wage share dynamics can be illustrated as follows:

$$\psi = \frac{Wb}{P}$$

$$\frac{\dot{\psi}}{\psi} = \frac{\dot{W}}{W} + \frac{\dot{b}}{b} - \frac{\dot{P}}{P} \tag{1.15}$$

The percentage change in wage share $\left(\frac{\dot{\psi}}{\psi}\right)$ is equal to the difference between the sum of the percentage change in nominal wages $\left(\frac{\dot{W}}{W}\right)$ and rate of change in the unit labor requirement $\left(\frac{\dot{b}}{b}\right)$ and inflation $\left(\frac{\dot{P}}{P}\right)$. Unit labor requirement is the negative of productivity changes and considered

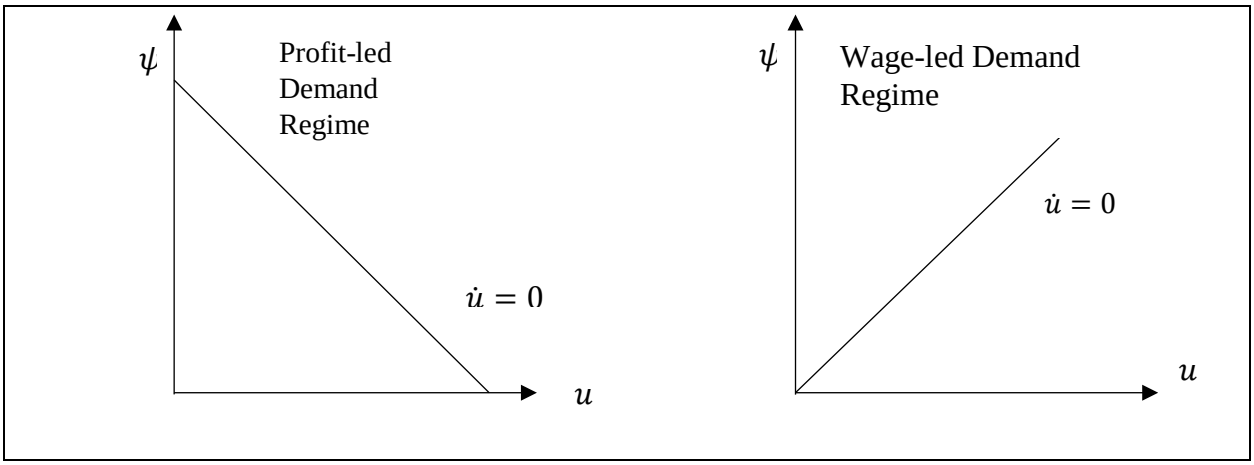

Figure 1.1: Profit-led versus Wage-led Demand Regimes.

to be exogenously determined in Latin American countries $\left(\frac{\dot{b}}{b} = -\varepsilon\right)$, a plausible reflection of the distinct features of the two regions. Wooster and Diebel (2010) reviews the empirical literature on technological spillovers from FDI to domestic firms and uses meta-regression analysis with 141 spillover effects detected by 32 empirical analysis. According to the authors, the presence of foreign firms increases productivity of domestic firms only among Asian countries. Based on this empirical finding, it is assumed that the stock of foreign capital in Asian countries positively effects labor productivity in the whole economy. Therefore, the change in the unit labor requirement becomes a negative function of the share of foreign capital stock in output $\left(\frac{\dot{b}}{b} = -\sigma f\right)$.

Changes in nominal wages $\left(\frac{\dot{W}}{W}\right)$ are assumed to be the outcome of a bargaining process by workers. Workers are interested in their real wage but can bargain through nominal wages and target a wage share (ψ_w). Worker's bargaining power over nominal wage setting is also negatively affected by the unemployment rate or positively correlates with capacity utilization (u) (Taylor, 2003). In an open economy export oriented setting, workers are less effective in pushing for an increase in ψ_w as productivity increases In the medium-run, the real exchange rate also determines the actual price of worker's imported consumption goods and workers react to changes in real exchange through demanding higher nominal wages. Under these conditions $\frac{\dot{W}}{W}$ can be illustrated for both countries as follows:

$$\frac{\dot{W}}{W} = \theta_1(\psi_w - \psi) + \theta_2 q + \theta_3 u \tag{1.16}$$

Rate of change in the nominal wage in both countries depends on the adjustment rate of actual wage shares to targeted wage shares and the real exchange rate in the short-run. In the medium-run, nominal wages are positively related to capacity utilization which affects the bargaining power of workers.

Prices are determined through the mark-up decisions of firms. Actual prices converge to this targeted level of wage shares (ψ_f) by firms $\left(\frac{\dot{P}}{P} = \delta(\psi - \psi_f)\right)$ (Blecker, 2012). Targeted wage shares are determined through targeted mark-up rates which are a positive function of the real exchange rate $\left(\psi_f = 1 - \pi_f = \frac{1}{1+\tau_f(q)}\right)$. There is no one to one relationship between real exchange rates and mark-up rates due to the exchange rate pass through problem. A change in exchange rate is not fully reflected through prices, due to competition and the bargaining power of workers. Real exchange rate appreciation increases the targeted mark-up rate but it must be less than the appreciation itself (Arestis & Milberg, 1994). For analytical purposes the targeted wage share $\psi_f = z - \gamma q$ is assumed to be a parameter that varies negatively with market power of firms. Price inflation can be written as follows for both countries;

Wage share dynamics can be obtained by substituting equations (1.16), price inflation and unit labor requirements into equation (1.15). In the Latin American case since labor productivity is determined exogenously, wage share dynamics can be shown as follows:

$$\frac{\dot{\psi}}{\psi} = \theta_1(\psi_w - \psi) + \theta_2 q + \theta_3 u - \varepsilon - \delta(\psi - z + \gamma q)$$

$$\frac{\dot{\psi}}{\psi} = \theta_1\psi_w + \delta z + (\theta_2 - \delta\gamma)q + \theta_3 u - \varepsilon - (\delta + \theta_1)\psi \qquad (1.17a)$$

In the Asian case, as distinct from Latin American countries, capital flows have spillover effects across the economy and hence increases productivity level in that country. Based on this fact, wage share dynamics is differentiated in Asian countries as follows:

$$\frac{\dot{\psi}}{\psi} = \theta_1(\psi_w - \psi) + \theta_2 q + \theta_3 u - \sigma f - \delta(\psi - z + \gamma q) \qquad (1.17b)$$

$$\frac{\dot{\psi}}{\psi} = \theta_1\psi_w + \delta z + (\theta_2 - \delta\gamma)q + \theta_3 u - \sigma f - (\delta + \theta_1)\psi$$

In both equations 1.17a and 1.17b, the coefficient of the real exchange rate $(\theta_2 - \delta\gamma)$ is considered positive which means that the bargaining power of workers for nominal wages is stronger than the ability of capitalists to reflect the real exchange depreciation to their prices. The main reason for this assumption is the demonstration effect of the development process. According to Cardoso and Faletto (1979), the demonstration effect is the modernization of consumption patterns as a result of the increasing income of urban working population. This in turn motivates the import of consumption goods and brings the development path to a halt. Thus, real exchange rate depreciation leads to higher nominal wage demands from workers.

Steady state values of wage shares (ψ_{ss}) among Latin American and Asian countries are shown in equations (1.18a) and (1.18b), respectively.

$$\psi_{ss} = \frac{\theta_1\psi_w + \delta z + (\theta_2 - \delta\gamma)q + \theta_3 u - \varepsilon}{(\delta + \theta_1)} \tag{1.18a}$$

$$\psi_{ss} = \frac{\theta_1\psi_w + \delta z + (\theta_2 - \delta\gamma)q + \theta_3 u - \sigma f}{(\delta + \theta_1)} \tag{1.18b}$$

In the medium-run both set of countries have a positively sloped distributive curve $(\dot{\psi} = 0)$ that is $\frac{\partial\psi_{ss}}{\partial u} = \frac{\theta_3}{\delta+\theta_1}$. In the medium-run effective demand and distributive curve forms a two by two model and solution to this model is the medium run equilibrium for both sets of countries. In the medium-run real exchange rate (q) is assumed to be stable in the short-run. The stability conditions of this model is investigated for both profit-led and wage-led demand regimes in the Appendix I. In the case of a profit-led demand the system is found to be stable. Wage-led demand regimes are also stable, but it is not certain whether it approaches to steady state by damped

oscillations or reaches the equilibrium immediately. However, it is assumed that the parameters ensure that the system is asymptotically stable for analytical reasons.

Figure 1.2 shows the medium-run equilibrium condition for wage-led and profit-led demand regimes. A shift in effective demand curve ($\dot{u} = 0$) results in higher equilibrium wage shares and capacity utilization in both demand regimes, while a shift in the distributive curve ($\dot{\psi} = 0$) leads to lower wages and higher capacity utilization in a profit-led demand regime and to lower wage shares and lower capacity utilization in a wage-led demand regime. The equilibrium is determined once the short-run steady state values of real exchange rate, capital flows and wage shares are determined. The following section investigates short-run equilibrium.

1.3 Short-run Equilibrium: Wage Shares, Real Exchange Rate and Capital Flows

In the short-run equilibrium, wage shares, real exchange rate and capital flows determine the steady state values of real exchange rate, wage shares and capital flows. In the short-run, wage shares, capital flows and real exchange rates determine the steady state values of these variables and in the medium-run, wage share and capacity utilization adjust to these values.

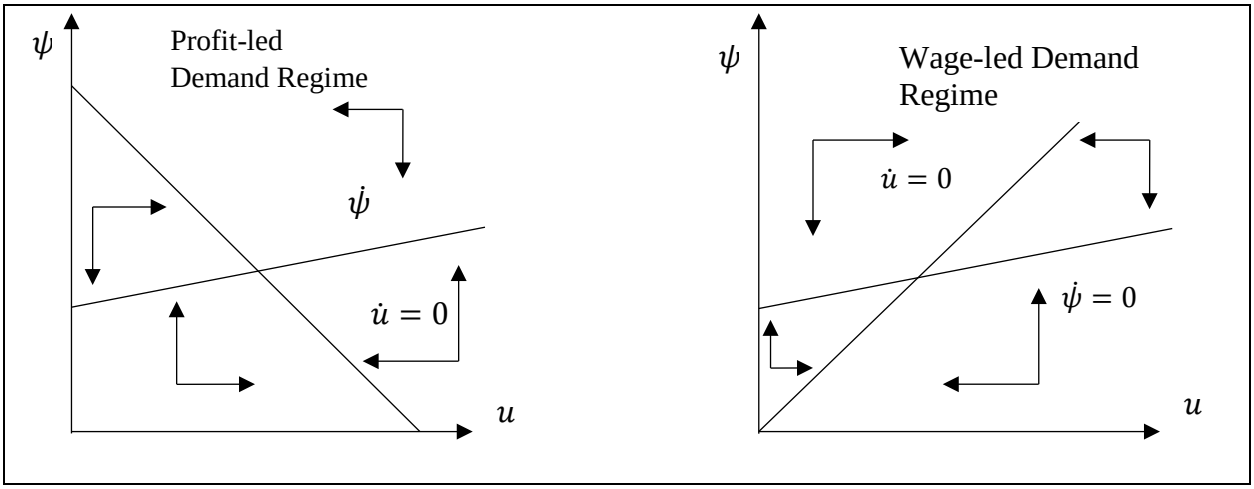

Figure 1.2: Medium-run equilibrium under wage-led (right) and profit-led (left) demand regimes

1.3.1 Dynamics of Foreign Capital

The nature of foreign capital flows to Asia and Latin America are intrinsically different. Foreign investments flowing to Latin America tend to be market seeking or used to fulfill finance to external imbalances. They are not constrained by capital controls. These types of foreign flows are not so different from portfolio investments in terms of the behavior and the outcome, real exchange rate appreciation. The dynamics of foreign capital flows as the share of total outcome can be summarized as follow;

$$\frac{\dot{f}}{f} = \alpha_1(u - u_f) + \alpha_2(i - i_f) + \alpha_3(f_c - f) \tag{1.19a}$$

The first term on the right-hand side of equation (1.19a) captures the effect of higher growth compared to foreign countries on foreign debt. The first two variables on the right-hand side of equation (1.20a) captures the traditional pull-push factors (Calvo, Leiderman, & Reinhart, 1996). The difference between foreign capacity utilization (u_f) and domestic capacity utilization (u) (that is kept constant in the short-run) effects capital flows positively. Increases in u results in higher demand for import goods and increases the demand for foreign financing. A decrease in u_f pushes foreign debt and capital to countries which experience higher u. A higher level of u is also an indicator of debt sustainability and soundness of the economy. The second term is the difference between domestic and foreign interest rates. A decrease in foreign interest rates (i_f) results in higher foreign debt available for countries that apply higher interest rates. The last term introduces the effect of fundamentalist investors. As stock of foreign capital arrives at a critical value that is considered as "sustainable", the total positive effect of increasing f is diminishing and beyond this point total effect becomes negative. Capital account liberalization usually pushes f_c to higher levels and leads to booms in foreign financing. (Harvey, 2009; Calvo et al.,1995)

The steady state level of foreign capital stock among Latin American countries is

$$f_{ss} = \frac{\alpha_1(u - u_f) + \alpha_2(i - i_f) + \alpha_3 f_c}{\alpha_3} \tag{1.20}$$

Foreign capital flows to Asian countries tend to be production oriented and resource seeking and flow to countries with cheap resources (including labor). Differently from Latin American countries, these flows are constrained by capital controls and will be treated as exogenously determined by the central authority. In this case capital flows have an effect on the growth of productivity of labor as laid out in equation (1.17b). The growth rate of labor productivity will be equal to foreign capital stock that is allowed by the central government $\left(\frac{\dot{b}}{b} = \sigma\bar{f}\right)$. Foreign capital in Asian countries effect the medium-run equilibrium through its impact on wage share and real exchange rate.

1.3.2 Real Exchange Rate Dynamics

Real exchange rate dynamics are in effect differently among Latin American and Asian countries due to the different nature of capital flows to these countries. As it is explained above, due to lack of capital controls and the market seeking nature of foreign capital, Latin America results in real exchange rate appreciation as the nominal exchange rate appreciates. The existence of capital controls insulates Asian countries from this impact, while spillover effects of foreign capital increase labor productivity and depresses the wage share in these countries. Asian countries follow a real exchange rate targeting policy in the presence of capital controls. Dynamics of the real exchange rate can be decomposed into two effects; the nominal exchange rate dynamics $\left(\frac{\dot{e}}{e}\right)$ and price inflation $\left(\frac{\dot{p}}{p}\right)$. Price inflation is illustrated formerly. In the Latin American case a change in the nominal exchange rate becomes a function of existing foreign capital stock and increases in foreign capital, as capital flows lead to an appreciation of the nominal exchange rate. So,

percentage change in the nominal exchange rate becomes the function of foreign capital stock $\left(\frac{\dot{e}}{e} = -\mu f\right)$. Equation (1.21a) captures the dynamics of real exchange rate among Latin American countries.

$$\frac{\dot{q}}{q} = \frac{\dot{e}}{e} - \frac{\dot{P}}{P}$$
$$\frac{\dot{q}}{q} = -\mu f - \delta(\psi - z + \gamma q)$$
$$\frac{\dot{q}}{q} = -\mu f - \delta\psi + \delta z - \delta\gamma q \tag{1.21a}$$

Nominal exchange rates in Asian countries are modelled as a managed exchange rate regime analogously to Blecker (2012). The real exchange rate adjusts to the level of the monetary authorities' medium-run target for the real exchange rate $\left(\frac{\dot{e}}{e} = \beta(\bar{q} - q)\right)$. Real exchange rate dynamics for Asian countries can defined as follows:

$$\frac{\dot{q}}{q} = \frac{\dot{e}}{e} - \frac{\dot{P}}{P}$$
$$\frac{\dot{q}}{q} = \beta(\bar{q} - q) - \delta(\psi - z + \gamma q)$$
$$\frac{\dot{q}}{q} = \beta\bar{q} - \delta\psi + \delta z - q(\beta + \delta\gamma) \tag{1.21b}$$

The steady state value of the real exchange rate for Latin American and Asian countries are captured by equations (1.22a) and (1.22b).

$$q_{ss}^{LA} = \frac{-\mu f - \delta\psi + z}{\gamma} \tag{1.22a}$$

$$q_{ss}^{A} = \frac{\beta\bar{q} - \delta\psi - \delta z}{(\beta + \delta\gamma)} \tag{1.22b}$$

1.3.3 Short-run Equilibrium

Equations (1.17a), (1.19a) and (1.21a) form a 3x3 dynamic system for Latin American countries while (1.17b), (1.22b) form 2x2 dynamic system for Asian countries. Table 1.1 illustrates

this system of equations. As illustrated in the table, capital flows effect distribution through the real exchange rate in Latin American countries. In the Asian case, foreign capital effects distribution directly through its effects on productivity. These two divergent effects of foreign capital have different outcomes.

1.3.3.1 Short-run Equilibrium of Latin American Countries

Short-run equilibrium of Latin American countries is the outcome of the dynamic relationship between capital flows, real exchange rate and wages shares. Firstly, the relationship between capital flows ($\dot{f} = 0$) and real exchange rate ($\dot{q} = 0$) is of interest. Capital flows are modeled to respond to factors like difference between domestic and foreign capacity utilization, interest rate differentials and critical value of foreign capital for financing needs.

Steady state values of foreign capital $\left(f_{ss}(q_{ss}, \bar{\psi}_{ss})\right)$ and of foreign exchange $\left(q_{ss}(f_{ss}, \bar{\psi}_{ss})\right)$ shows the equilibrium in capital markets and foreign exchange markets. (Equations (1.19a) and (1.22a)). The slope of $\dot{f} = 0$ and $\dot{q} = 0$ are as follows:

$$\left(\dot{f} = 0\right) \quad \frac{\partial f}{\partial q} = 0 \tag{1.23}$$

$$(\dot{q} = 0) \quad \frac{\partial q}{\partial f} = -\frac{\mu}{\gamma} < 0 \tag{1.24}$$

The foreign exchange nullcline ($\dot{q} = 0$) has a negative relationship with capital flows which mainly means increasing foreign capital results real exchange rate appreciation among Latin American countries. The capital flows nullcline ($\dot{f} = 0$) is fixed at the level of f_{ss} and is not a function of q_{ss}. Below diagram in Figure 1.3 illustrates foreign exchange and capital flows curves for Latin American countries. The stability condition of the dynamical system of equations for Latin American countries are investigated in the Appendix and it is found stable. An upward shift

Table 1.1: System of Equations in the Short-run Equilibrium

Latin American Countries	**Asian Countries**
$\frac{\dot{\psi}}{\psi} = \theta_1\psi_w + \delta z + (\theta_2 - \delta\gamma)q + \theta_3 u - \varepsilon - (\delta + \theta_1)\psi$ $\frac{\dot{f}}{f} = \alpha_1(u - u_f) + \alpha_2(i - i_f) + \alpha_3(f_c - f)$ $\frac{\dot{q}}{q} = -\mu f - \delta\psi + \delta z - \gamma\delta q$	$\frac{\dot{\psi}}{\psi} = \theta_1\psi_w + \delta z + (\theta_2 - \delta\gamma)q + \theta_3 u - \sigma\bar{f} - (\delta + \theta_1)\psi$ $\frac{\dot{q}}{q} = \beta\bar{q} - \delta\psi - \delta z - q(\beta + \delta\gamma)$

in the capital flows curve $(\dot{f} = 0)$ results in an appreciated real exchange rate and a higher level of foreign capital for financing needs. A shift in the foreign exchange curve $(\dot{q} = 0)$ does not change f_{ss} but results with depreciated real exchange rate.

The real exchange rate determined by foreign exchange and capital flows curves in turn determines the distribution of the economy. The real exchange rate affects distribution both through bargaining power of workers and pricing decisions of industrial firms.

Above graph in Figure 1.3 illustrates the relationship between wage share curve $(\dot{\psi} = 0)$ and foreign exchange rate curve $(\dot{q} = 0)$. The resultant equilibrium real exchange rate effects the distribution of the economy. As mentioned earlier, real exchange rate effects wage share through the demand of workers for foreign goods and the pricing decision of industrial firms. As real exchange rate appreciates, workers' incentives to bargain for higher nominal wages decline and industrial firms target lower level of mark-up rates since imported intermediate goods become cheaper.

Slopes of wage share and foreign exchange rate curve are found through equations (1.18a) and (1.22a) as follow;

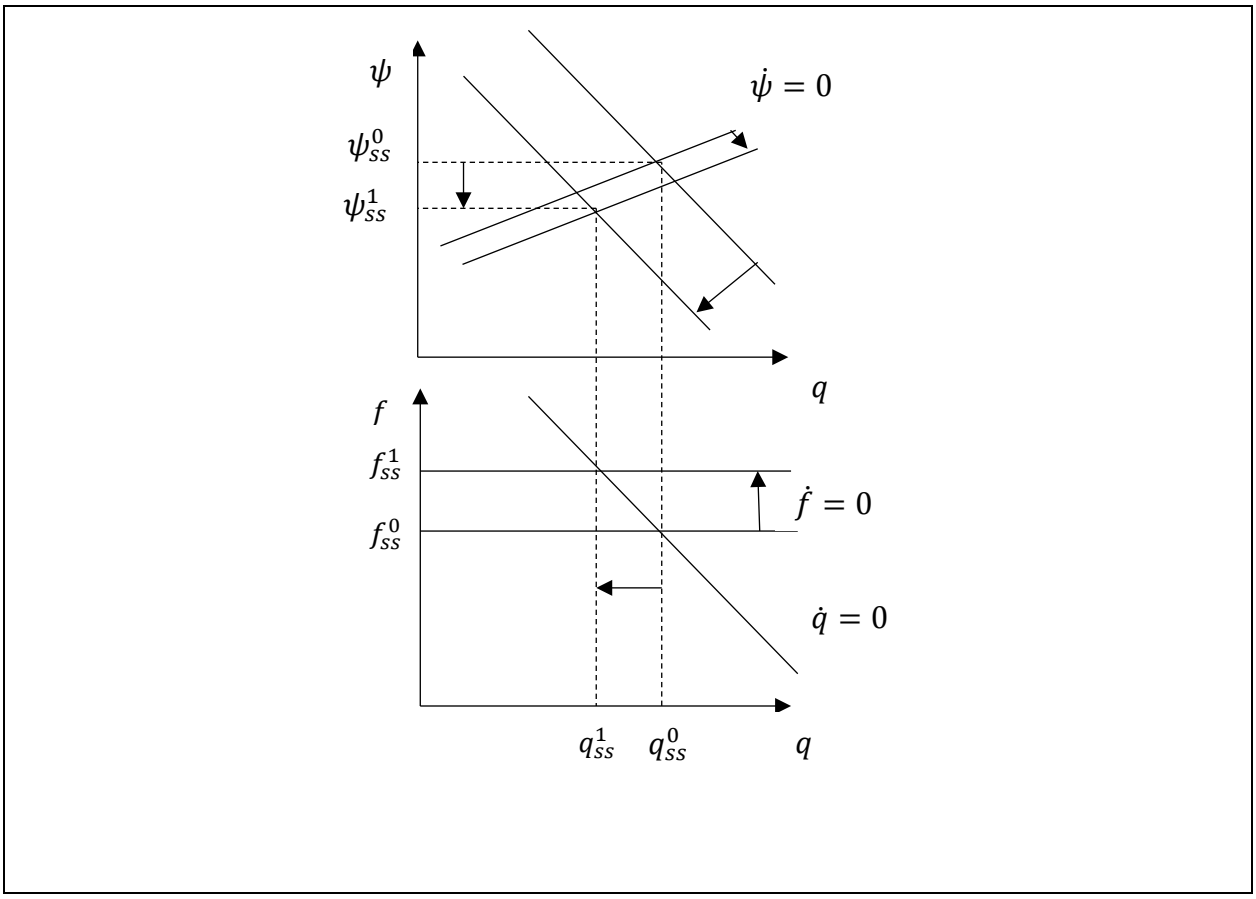

Figure 1.3:Short-run Dynamics between Wage-Shares, Real Exchange Rate and Capital Flows for Latin American Countries

$$\left(\dot{\psi} = 0\right) \quad \frac{\partial \psi}{\partial q} = \frac{(\theta_2 - \delta\gamma)}{(\delta + \theta_1)} > 0 \tag{1.25}$$

$$(\dot{q} = 0) \qquad \frac{\partial q}{\partial \psi} = -\frac{\delta}{\gamma} < 0 \tag{1.26}$$

The slope of the distribution curve is greater than zero as shown in Equation (1.25). As urban population increases, the consumption pattern is modernized and thus there is an increase in the demand for foreign goods. However, industrial firms cannot reflect changes in the real exchange rate directly due to exchange rate pass through problems. It is assumed that demands of workers for foreign goods is stronger than that of industrial firms for imported intermediate goods. Real exchange rate depreciation puts an upward pressure on higher nominal wages to adjust for the consumption of foreign goods. The slope of the foreign exchange curve $(\dot{q} = 0)$ is negative.

As wage shares decline, prices fall, resulting in turn results in real exchange rate appreciation as is shown in equation (1.22a).

The short-run dynamics between capital flows, the real exchange rate and the wage share are illustrated in below graph at Figure 1.3 for Latin American countries. An increase in capital flows due to any exogenous shock from decreasing foreign capacity utilization, foreign interest rates, optimistic foreign investors and increasing domestic interest rates, shifts the capital flows curve ($\dot{f} = 0$) upwards. This results in an appreciated real exchange rate (q_{ss}^1) and higher available foreign capital for financing needs (f_{ss}^1). This new equilibrium results in a leftward shift of foreign exchange curve and rightward shift of distribution curve in the upper diagram. The shift in foreign exchange curve is greater than the shift in distribution curve. The main reason for this is the diminishing bargaining power of workers on their nominal wages. The more appreciated real exchange rate makes import consumption goods cheaper and this fact results in a decrease in nominal wages. As nominal wages decrease the wage share adjusts to a lower steady state equilibrium level (ψ_{ss}^1).

1.3.3.2 Short-run Equilibrium of Asian Countries

In the case of Asian countries, capital flows are exogenously determined by the central authority (in the very abstract case) and affect productivity changes. An increase in productivity due to a higher level of foreign capital leads to a lower level of the wage share, as shown in equation (1.17b). Figure 1.4 illustrates the shorter run relationship between real exchange rate and wage shares and shows the effect of an increase in capital flows on wage shares and real exchange rate. In the Asian case equations (1.17b) and (1.21b) forms a 2x2 dynamic system which is found stable and corresponding stability conditions are investigated in the Appendix I.

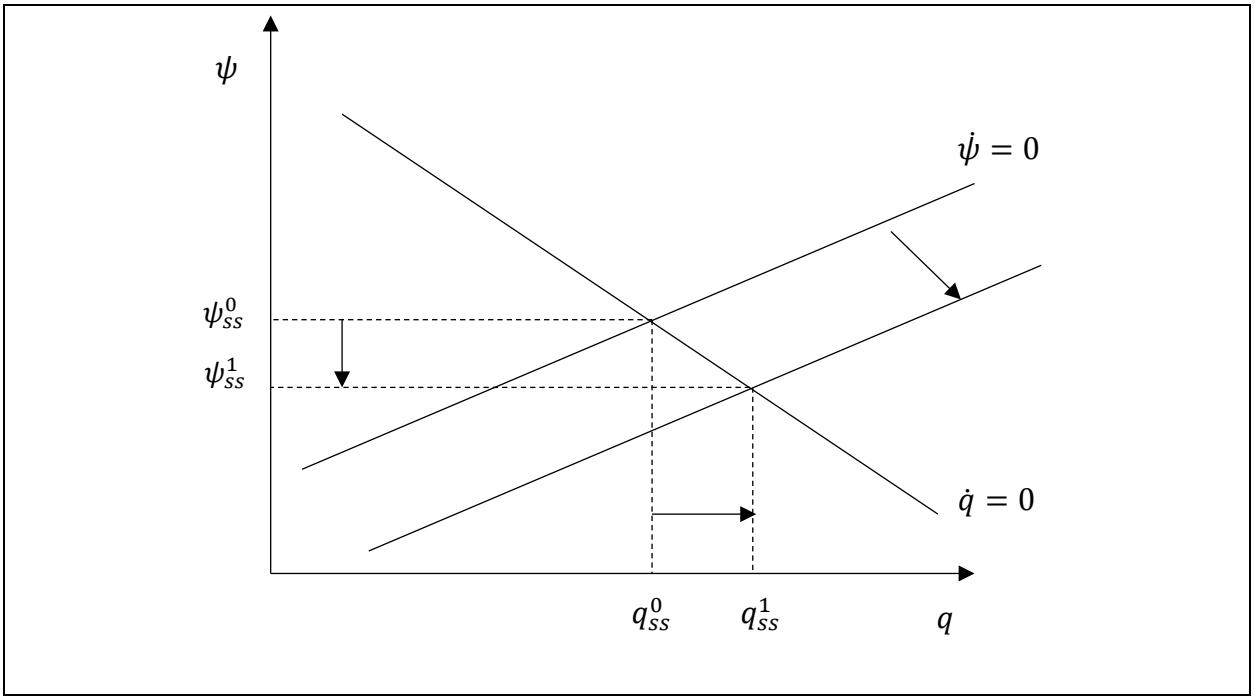

Figure 1.4: Medium-run dynamics between wage-shares, real exchange rate and capital flows for Asian countries.

The increase in foreign capital inflow directed by the central authority to productive sectors ($\bar{f}$), and results in productivity increases in the general economy through spillover effects. This pushes the wage share curve ($\dot{\psi} = 0$) down, since productivity changes negatively affect wage shares as shown in equation (1.17b).

An exogenous decrease in wage shares pushes the price level down and in turn results in real exchange rate depreciation through equation (1.22b). The new equilibrium in the medium turn for Asian countries is associated with lower wage shares and a depreciated real exchange rate.

Figures 1.3 and 1.4 capture the varying outcomes of an increase in capital flows during the shorter-term. In the Latin American case, an increase in foreign capital stock for financing needs results in an appreciated real exchange rate, lower level of wage shares and higher foreign capital stock for financing needs. However, capital flows that are directed to the productive sector lowers the wage share due to a higher level of productivity and depreciates the real exchange rate. These

different outcomes with respect to distinct types of foreign capital have different implications in the process of medium-run adjustment.

1.4 Medium-Run Adjustment of Goods Market to Short-Run Dynamics

Medium-run adjustment to short-run equilibrium conditions occurs through the dynamic interaction between capacity utilization and wage shares. In this section, the adjustment process is investigated for Latin American and Asian countries based on both profit-led and wage-led demand regimes.

1.4.1 Latin American countries

Equations (1.14) and (1.18a) form the medium-run goods market equilibrium for Latin American countries. The steady state values of real exchange rate and foreign capital is determined in the short-run and are treated as shift variables in the medium-run analysis. In the Latin American case, an exogenous increase in foreign capital for deficit financing as the result of a decrease in interest rates, capacity utilization abroad or a positive change in the risk perception of foreign investors about domestic country's ability to pay returns, leads real exchange rate appreciation and increases the foreign indebtness of the domestic country. These two effects have negative effect on capacity utilization. Firstly, real exchange rate appreciation deteriorates the country's export competitiveness, increases the cost of production and decreases the value of return payments of foreign capital. This leads to a deterioration in the current account deficit. The effect of real exchange rate appreciation on effective demand $\left(\frac{\partial \dot{u}}{\partial q}\right)$ can be detected using the implicit function theorem as follows:

$$d\dot{u} = \frac{\partial \dot{u}}{\partial u} du + \frac{\partial \dot{u}}{\partial q} dq = 0 \tag{1.28}$$

$$\frac{du}{dq} = -\frac{\frac{\partial \dot{u}}{\partial q}}{\frac{\partial \dot{u}}{\partial u}} = -\frac{\eta\frac{\epsilon}{q} - au - if(g_3 + u)}{\frac{\partial \dot{u}}{\partial u}}$$

Equation (1.27) shows the effect of real exchange rate appreciation on the demand curve. The denominator $\left(\frac{\partial \dot{u}}{\partial u}\right)$ must be smaller than zero again due to Keynesian stability. The first term in the denominator $\left(\eta\frac{\epsilon}{q}\right)$ is the export price elasticity times the level of exports in foreign prices[2]. On the basis of Marshall-Lerner condition, the effect of real exchange rate appreciation on trade balances is negative $\left(\left(\eta\frac{\epsilon}{q} - au\right) < 0\right)$. This assumption also makes sense when the quite low level of export elasticities of Latin American countries is considered (Palma, 2009).

Secondly, the effect of an exogenous increase in the foreign debt in the short-run can be investigated through the implicit function theorem as follows:

$$d\dot{u} = \frac{\partial \dot{u}}{\partial u}du + \frac{\partial \dot{u}}{\partial f}df = 0$$

$$\frac{du}{df} = -\frac{\frac{\partial \dot{u}}{\partial f}}{\frac{\partial \Delta}{\partial u}} = -\frac{-\Omega q i(g_3 + u)}{\frac{\partial \dot{u}}{\partial u}} \qquad (1.28)$$

In equation (1.28) the denominator $\left(\frac{\partial \dot{u}}{\partial u}\right)$ must be smaller than zero given the Keynesian stability condition and the effect of an increase in foreign debt also shifts effective demand curve as in the case of real exchange rate appreciation. The real exchange rate appreciation shifts the distributive curve downwards, as mentioned earlier.

Figure 1.5 shows the medium-run adjustment of effective demand among Latin American countries after an exogenous increase in capital flows. A positive shift of the foreign exchange rate

[2] $\eta = \frac{d\epsilon}{dq}\frac{q}{\epsilon} \Rightarrow \frac{d\epsilon}{dq} = \frac{\eta q}{\epsilon}$

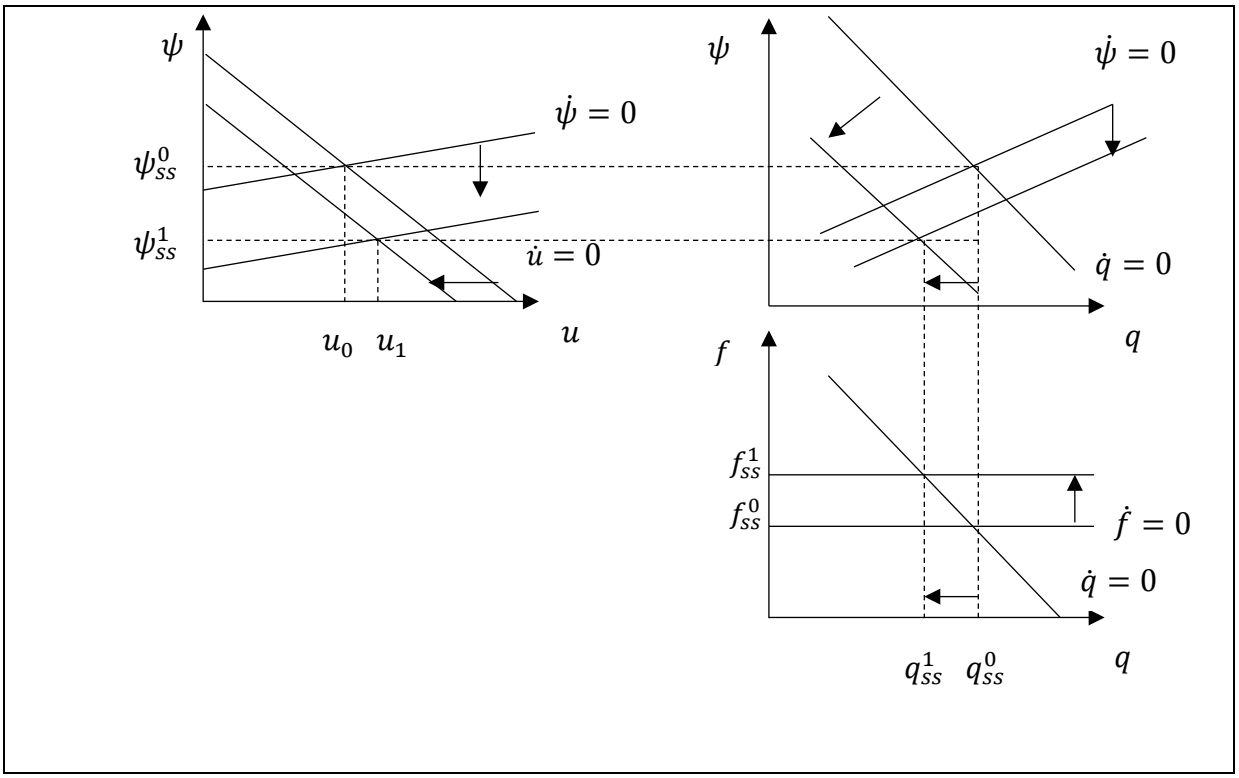

Figure 1.5:Medium-run adjustment in Latin American countries after an exogenous increase in capital flows. (Profit-led Demand)

curve in the north-east diagram of Figure 1.5, leads to real exchange rate appreciation from q_{ss}^0 to q_{ss}^1 because capital flows lead to nominal exchange rate appreciation. An appreciated real exchange results in lower prices of imported goods. Lower prices serve as a disincentive to workers bargain for high nominal wages. Consequently, the wage share decreases and new short- run equilibrium after the capital flow shock is $(\psi_{ss}^1, q_{ss}^1, f_{ss}^1)$. North-west graph shows the medium run adjustment. In the north-west graph, the wage share curve ($\dot{\psi} = 0$) shifts left as the result of an exogenous increase in capital flows in the short-run. Real exchange rate appreciation negatively impacts export price competitiveness and leads to an increase in the current account deficit, given the Marshall-Lerner condition. This leads to a shift in the effective demand to the left. The negative effects of a real exchange rate appreciation through current account deficits do not totally offset the positive effect of decreasing wage shares through higher investment levels. Higher current

account deficits associated with increasing capacity utilization has been observed in Latin American countries.

Figure 1.6 illustrates the same adjustment under wage-led demand condition. Under wage-led demand regimes, effects of medium run-effects are quite different than wage-led demand. The resultant effects of capital flows are lower capacity utilization, wage shares and higher trade deficits.

1.4.2 Asian Countries

In the case of Asian countries, an increase in capital flows that is directed to productive sectors increases the productivity of labor $\left(\frac{\dot{\varepsilon}}{\varepsilon} = \sigma f\right)$ that shifts the wage share curve to the right as is illustrated in Figure 1.7 in the graphs on the right.

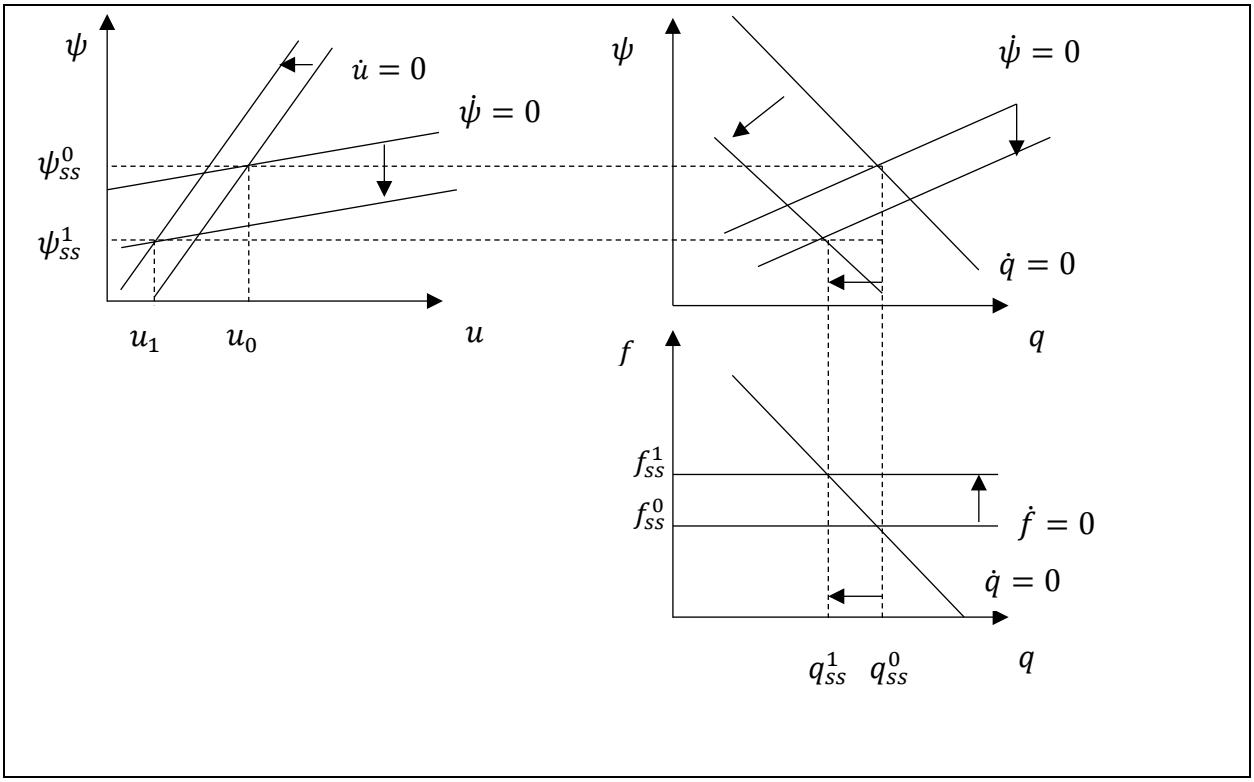

Figure 1.6: Medium-run adjustment in Latin American countries after an exogenous increase in capital flows. (Wage-led Demand)

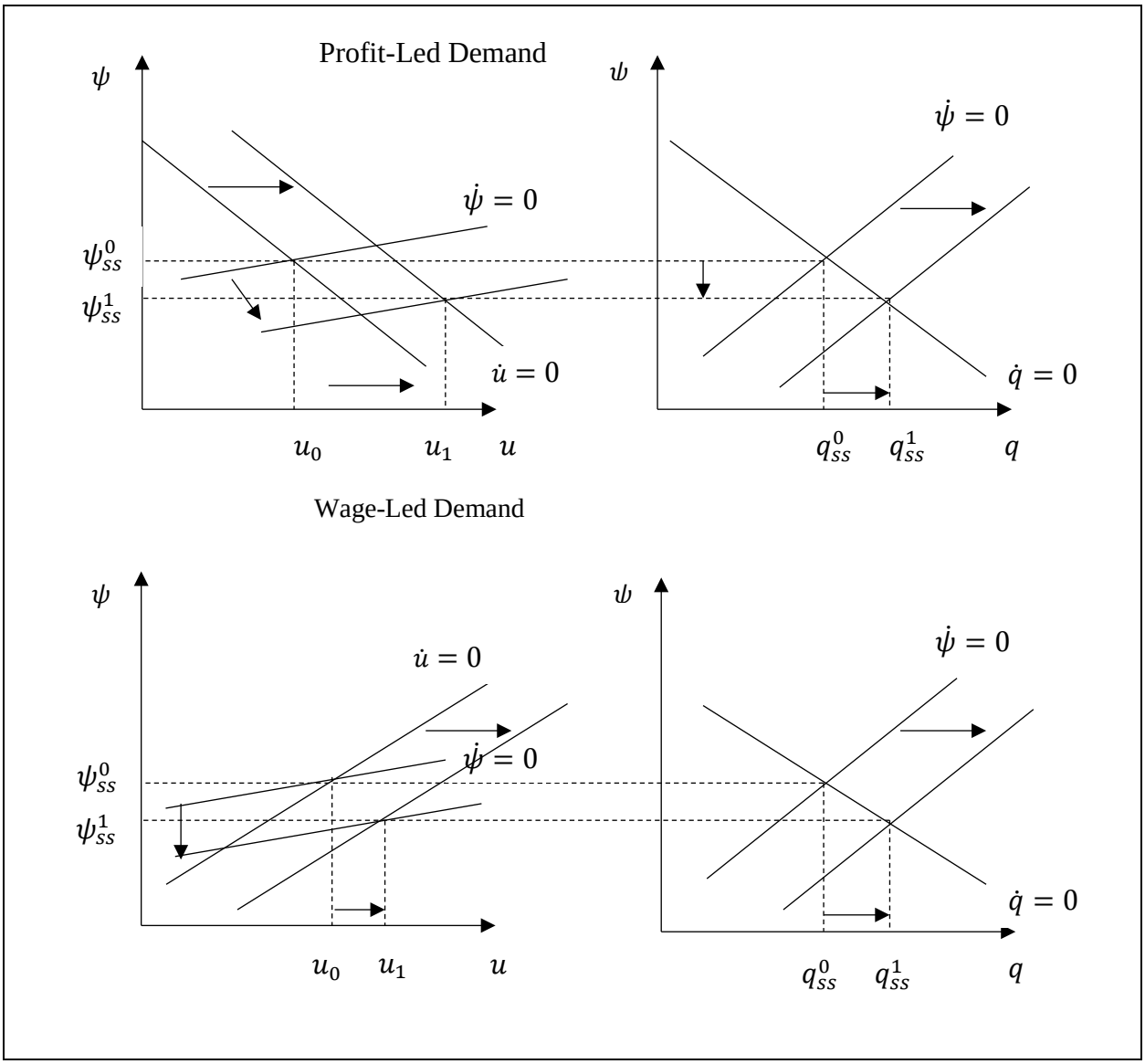

Figure 1.7: Medium-run adjustment in Asian countries after an exogenous increase in capital flows under both profit and wage-led demand regimes.

In the short term, an increase in foreign capital boosts productivity and pushes wage shares down. As wage shares decrease the real exchange rate depreciates due to lower domestic price levels (eq. 1.22b). As a result, medium-run equilibrium will be (q_{ss}^1, ψ_{ss}^1) where wage share is lower but the real exchange rate is higher than the former equilibrium. In a profit-led Asian economy, the wage share curve will shift to the right due to a new level of productivity. The effective demand also shifts to the right because of increased export competitiveness resulting

from a depreciated domestic currency. In the new short-run equilibrium (ψ_{ss}^1, u_{ss}^1), higher capacity utilization is associated with improved trade balances or higher surpluses.

In the wage-led Asian country, improvement in productivity again shifts the wage share curve down. The positively sloped effective demand curve shifts to the right due to a depreciated real exchange rate. This shift is strong enough to end up with higher levels of capacity utilization. Higher export competitiveness of Asian exports is the main reason for this shift. Lower prices of export goods increase foreign demand for export goods more due to higher real exchange rate elasticity of exports among Asian countries. In this new equilibrium $(u_1\ \psi_{ss}^1)$, lower wage shares are associated with higher capacity utilizations.

1.5 Conclusion

In this work, a post-Keynesian open economy model is presented with different specification to capture the distinct structure of Latin American and Asian countries. The model illustrates different impacts of different type of foreign capital investment in Latin American and Asian countries. The foreign capital for deficit financing, market seeking leads to nominal exchange rate appreciation in liberalized capital markets as in Latin American countries. This nominal exchange rate appreciation leads to real exchange rate appreciation and decreases the production costs through lower wage shares and imported intermediary goods. Finally, it results in higher capacity utilization in the case of profit-led open economies. However, real exchange rate appreciation leads to a deterioration in the current account balance due to the loss of price competitiveness of exports. In conclusion, it is assumed that this negative effect need not exceed the positive effect of investments and could lead to higher capacity utilization, lower wage shares, lower level of trade balances (or current account deficits) and higher foreign debt in the new

equilibrium. In the case of wage-led demand regime, capital flows result in lower capacity utilization, lower wage shares and higher current account deficits.

Asian countries apply controls on foreign capital divergently and direct the capital into productive export oriented sectors. This in turn increases the productivity of labor through spillover effects and pushes wage shares down. Lower wage shares decrease costs and price level in the country, again depreciating the real exchange rate. Real exchange rate depreciation increases the demand for exporting goods due to high price elasticity of export goods which ends with both higher capacity utilization and trade balances under a profit-led demand regime. Under wage-led regime results are not so different where high export demand for goods that compensate the effect of lower wage shares.

CHAPTER II

TWO PATHS TOWARD GLOBALIZATION

2.1 Introduction

Asian and Latin American countries followed two different strategies toward globalization in the post-1980 period. In the case of Latin American countries, trade and capital/financial account liberalization strategies were followed. Simultaneous liberalization of international trade and finance was the popular strategy advice that was built on the basis of ideological foundation of "Washington Consensus". In contrast to Latin American countries, Asian countries followed a distinctive path and promoted trade, while keeping a curb on financial liberalization. Imposing capital controls in an effective manner can bring about different relationship between capital flows and trade balances. Capital controls can direct capital flows to sectors which may have strong potentials for future export revenues. Additionally, they can constrain the speculative nature of capital flows that generates excessive liquidity in domestic markets and decreases domestic demand for imports. Thus, capital controls, at least, may render trade balances independent from capital flows or in the best scenario, capital flows may affect trade balances positively.

Effective employment of capital controls is deeply bounded up with the degree of dependency of periphery countries to international finance/financial capital. The degree of dependency to international financial markets may vary from country to country with respect to structural factors. These structural factors include domestic saving-investment rates, competitive external structure, regional production, strong state-society relations etc. In this chapter, dependent nature of Latin American and Asian countries is evaluated through the decomposition of current

account shocks. The chapter examines structural factors that lead to distinct forms of dependency, the importance of state action to strength the structural factors in Asian countries.

The first section of the chapter motivates the analysis of the different paths of Asian and Latin American countries toward globalization. The second section examines the evolution of dependency theory with respect to progress in economic history, from a perspective which emphasizes the importance of technological gap between center and periphery countries to a one which treats financial dependency as a new form of dependency. This recent conception of dependency, as financial dependency, is critiqued from a structural perspective. In this part, structural factors that reduce the degree of dependency to international financial markets/capital will be illustrated and the importance of public/state policy in shaping dependency will be emphasized. In the last section, different forms of dependent relations of periphery countries are illustrated through external shocks to their current account balances.

2.2 Two Paths of External Liberalization: Reluctant Asia vs. Desperate Latin America

Asian and Latin American countries employed different paths which have strong implications on the relationship between capital flows and trade balances. Global integration and liberalization of both external trade and finance can be analyzed through two indicators. First indicator is the “trade openness” index which is simply sum of exports and imports as percentage of GDP level. The higher indicator values refer to an increase in trade integration for a country. Second indicator is named as “Chinn-Ito Index” and indicates degree of capital account openness of a country. Chinn-Ito index is derived from binary dummy variables which encodes the tabulation of restrictions on cross-border financial transactions submitted in the IMF’s *Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER).* The Chinn-Ito index is

introduced by Chinn & Ito (2006) and gained popularity after that. *De Jure* measures of capital account openness are preferred due to the fact that *de facto* measures such as total volume of capital flows as percentage of GDP, do not show different patterns for Latin American and Asian countries.

Figures 2.1 and 2.2 illustrate trade openness and capital account openness measures between 1974 and 2014. As it can be seen from Figure 2.1, Asian countries surpass Latin American countries in terms of trade openness, though Asian countries tend to be more open financially than Latin American countries till 1996 in a *de jure* sense. Asian countries gradually liberalized both international capital transactions and trade flows from 1970s in consonance with export promotion strategies, while Latin American countries employed high tariff rates and restrictions on capital flow between 1970s and 1980s. In years following the Asian crisis, Asian countries started to apply capital controls again. After the debt crisis, Latin American countries were compelled to enforce capital market liberalization at the behest of IMF-World Bank and dismantled their capital controls and exchange rate pegs. Meanwhile, Asian countries had a greater success in integrating to the world trade system with effectively protected capital markets.

Chinn-Ito index is practically useful in illustration of the evolution of capital controls in longer time spans. However, the measure does not give information about capital controls that is targeted to specific type of capital flows whether FDI or portfolio investments. Schindler (2009) generates a new detailed capital account index that covers between 1995 and 2013. Schindler identifies capital controls under six categories of assets that are; shares or other securities of a participating nature; bonds or other debt securities; money market instruments; collective investments; financial credits and finally direct investments. The measure of capital controls on portfolio investments are calculated through the average of first four type of investments which

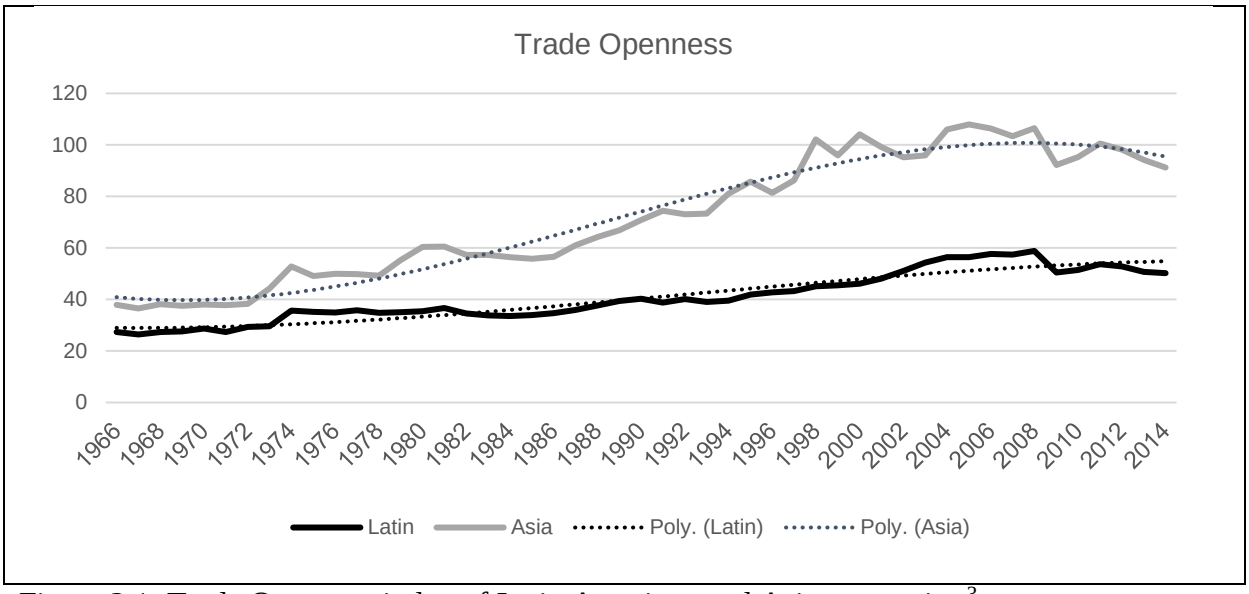

Figure 2.1: Trade Openness index of Latin American and Asian countries [3].
Source: World Bank
Note: Trade Openness=(Exports+Imports)/GDP

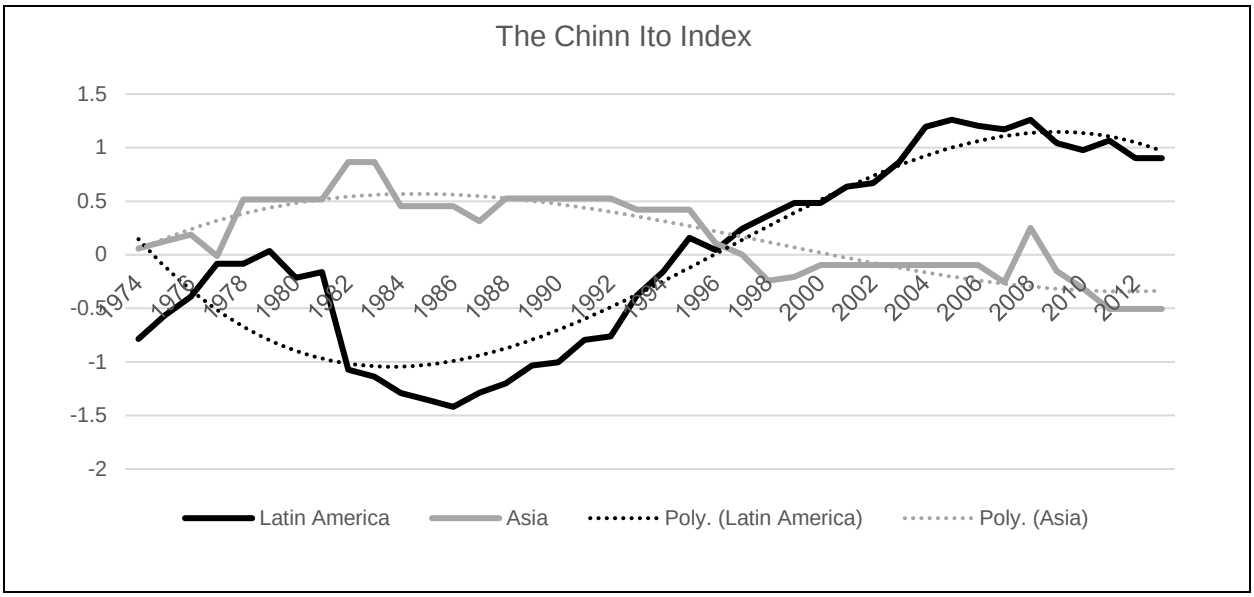

Figure 2.2: The Chinn - Ito Index for Capital and Financial Account Openness Source: (http://web.pdx.edu/~ito/Chinn-Ito_website.htm)[4]

[3] Latin American countries consist of Argentina, Brazil, Chile, Colombia, Costa Rica, Guatemala, Mexico, Panama, Uruguay, while Asian countries consist of China, Indonesia, Malaysia, Korea and Thailand. Trade openness index of the region is calculated through share of sum of total exports and total imports of each country in GDP levels of each country in the region.
[4] Regional Chinn-Ito Index is calculated through average of the corresponding region.

are considered as “portfolio” in Balance of Payments Manual. Contrary to the Chinn-Ito Index, higher values represent the most closed capital accounts.

Figures 2.3 and 2.4 illustrate respectively capital controls on portfolio investment inflows and on FDI flows to Asian and Latin American countries. Capital controls on portfolio investments are calculated on the basis of arithmetic average of controls on each type of foreign investments that can be considered as “portfolio investments”. These are shares or other securities of a participating nature; bonds or other debt securities; money market instruments; collective investments; financial credits. Control on FDI flows is already calculated by the author in data set as a distinct type of flow.

A more detailed capital control index derived by Schindler (2009) also confirms that Asian countries were more cautious while pursuing international financial liberalization while Latin American countries adopted measures of financial liberalization more aggressively or desperately due to international pressures of international governing institutions through structural adjustment programs etc. Following debt crisis, this divergent path toward globalization is the direct result of the nature of the financial dependency of these countries on the international financial markets. Santos (1970) highlights a new form of dependency based on multinational corporations that target domestic markets of periphery countries and stresses the importance of financial dependency. As periphery countries integrate to international financial markets, the control over natural resources is transferred to international financial capital and this compels them to pursue a development program which follow the interests of foreign capital owners. Contrary to Santos’ predictions, Asian countries had a visible success in coping with financial dependency and in pursuing a development path on the conditions of high world demand for manufacturing goods.

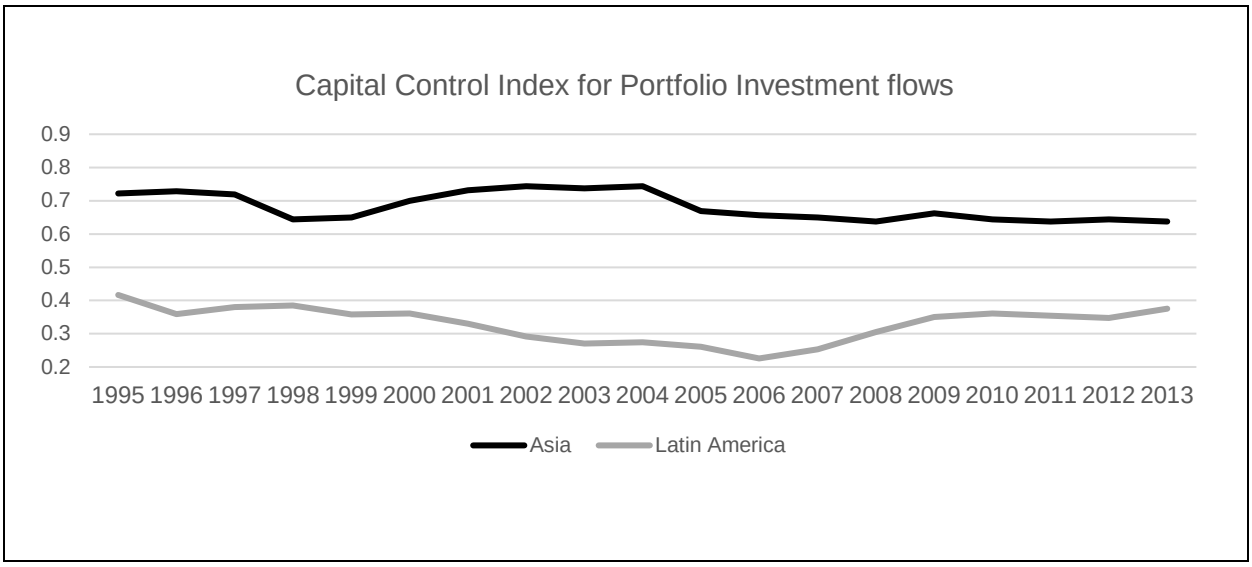

Figure 2.3: Capital control index for portfolio investment flows. (Schindler,2009)

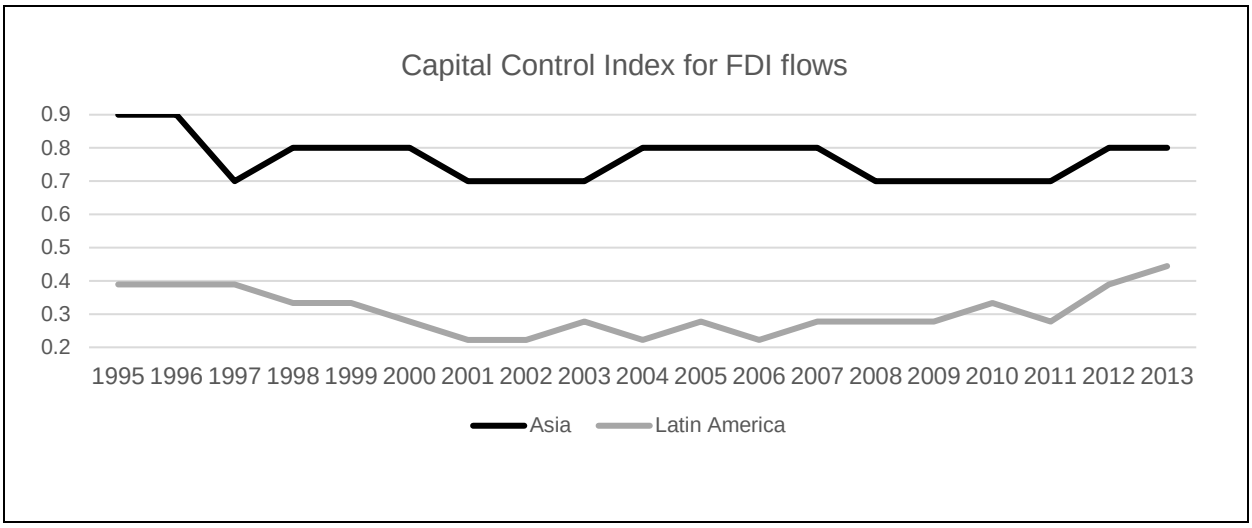

Figure 2.4: Capital control index for FDI flows. (Schindler,2009)

The financially dependent nature of Latin American countries is visible in the trend of net FDI inflows as a percentage of gross domestic formation. Figure 2.5 illustrates that net FDI inflows constitute a bigger share of gross fixed domestic capital formation among Latin American countries, as Santos predicted. After 1990 the measure increases significantly, following international financial liberalization. Further, the share increased after financial liberalization of Latin American countries. However, the measure stays relatively constant across Asian countries.

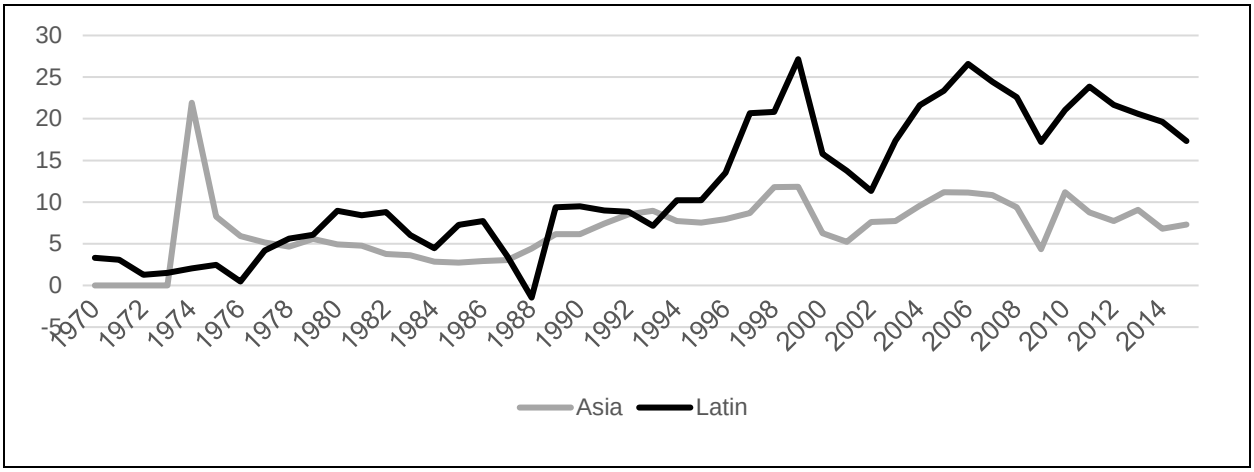

Figure 2.5: Net FDI Inflows as percentage of gross fixed capital formation
Source: WDI, World Bank

These stylized facts about the different patterns of liberalization motivate the analysis of divergent paths to dependency. Next section surveys the evolution of analytical framework of dependency from "technological" to "financial dependency" is illustrated in the light of developments in global economic history.

2.3 Evolution of Dependency Theory from Unbalanced Productive Forces to Finance

The dependency school developed in opposition to modernization theory which stresses the importance of impact of cultural deficiencies on capitalist development among underdeveloped nations due to traditional sector dominance in production (Handelman, 2009). Modernization assumes a linear development process and states that periphery countries should follow the same path that center countries travelled previously (free markets, well defined property rights etc.). This is manifested in Rostow's (2008),"Five Stages of Growth". In this extremely optimistic work, Rostow, outlines the development of a periphery nation. According to Rostow, as periphery develops from traditional stage and prepares for "take-off", the growth potential of these countries expands by following free market rules they can catch up center countries. As it can be seen from

Rostow's analysis, modernization theory treats underdevelopment as an internal phenomenon independent of external influence. Thus, following the path of wealthy nations can bring economic prosperity to periphery countries. Neo-Marxist dependency school stood against the optimism and the mechanical understanding of development that are derived by both orthodox Marxian and modernization theory.

2.3.1 Neo-Marxist Approach to Dependency

Neo-Marxist dependency theorists treat economic and social underdevelopment as the product of external forces that are conditioned by center countries' domination of periphery countries (Dore, 1983). Paul Baran (1962), the leading figure of Neo-Marxism conceptualizes dependency on the basis of both actual and potential economic surplus extraction in periphery countries. Economic surplus is the residual national output after basic spending for re-production of the society has deducted from national output. This surplus extraction is considered as the cause of initial division of the international labor and the technological differences among periphery and center countries. While center countries developed expertise on manufactured products for their domestic markets and abroad, periphery countries specialize on commodity/primary production to sell in center countries. The utilization of surplus by domestic ruling classes is also impossible due to their luxury consumption, increasing demands of army etc. (Baran, 1962).

Baran was also skeptical about benefits of foreign capital. Baran acknowledge that foreign capital played a role in development of periphery, and treats foreign capital ass one of the three potential sources of socio economic change[5]. According to Baran, foreign capital brings know-how to periphery countries and builds industrial development in alliance with local feudal interests

[5] Two other sources are mentioned as national capital and state. National capital was important in industrial development too, but the outcome in Latin America was more and more concentrated market structures alongside with protected domestic markets (Baran, 1962).

through high tariff protection for the benefit of gaining more and more control over the actual surplus created in periphery country. Thus, there is limited potential for periphery countries to effect a socioeconomic transformation or development under the severe and unequal conditions of global capitalism (Baran, 1962).

Paul Baran's analysis of underdevelopment paves the way for further analyses based on the process of surplus extraction and related institutions which reproduce conditions of underdevelopment in the work of Andre Gunder Frank, Samir Amin and Arghiri Emmanuel. Andre Gunder Frank (1969)criticizes modernization theory because modernization theory conceptualizes the development as a succession of capitalist stages. According to Frank, underdevelopment of periphery[6] countries is the direct result of the development of global capitalism, not the result of wasteful and insufficient institutional structures of periphery countries. Following Baran, Frank claims that the surplus extraction is the main cause for the underdevelopment of periphery countries. However, Frank draws away from Baran in assigning a determinant role for international trade in draining away the surplus to center countries through lower and decreasing purchasing power of primary commodities in terms of manufactured goods and stresses the importance of de-linking from the world markets. While Frank does not pay attention to the process of surplus extraction through production, both Arighiri Emmanuel and Samir Amin fill this space through claiming that center countries appropriate more labor time in exchange than they produced under condition of equal profit rates due to free international financial markets (Dore, 1983; Martinussen, 1997). Santos (1970) brings financial dependency into discussion while creating a hybrid dependency theory that stresses the importance of eternal and internal causes of development. Santos, in his new form of dependency, stresses that industrial development is

[6] In Frank's terminology center countries are named as metropolis and periphery countries as satellites. (Frank,2969; Frank 1976)

constrained and conditioned by cycles in the balance of payments. According to Santos, deficits rise in periphery countries due to three reasons; lower relative prices of raw materials compared to industrial products and inputs (as a result of Prebisch-Singer seminal thesis on deteriorating terms of trade); repatriation of profits from foreign investments in dynamic export sectors; necessary foreign financing to finance development and stimulate domestiv investments. As the industrialization potential of periphery countries are being constrained by balance of payments, the control over natural reosurces is transferred to international financial capitalists and that allows them to pursue a development program which only follow particular interests of foreign capital owners. Finally, Santos shares the same pessimist and stagnationist predictions of other Neo-Marxists and claims that the progress made by peripheycountries was dependent reproduction at the expense of superexploitation of labor unequal competition with foreign capital and trade (Santos, 1970). Overall, Neo-Marxist dependency school mainly focuses on the unequal exchange between periphery and center countries, stresses the role of unequal exchange in underdevelopment and reproduction of underdevelopment and finally advices de-linking from world capitalist world. Some structural transformations are not possible due to internal class structure and its formation with international dominion relations among countries. This stagnationist claim is raised mainly to refute Latin American Structuralist optimism about the success of structural transformation.

2.3.2 Latin American Structuralism

The Great Depression challenged the whole theoretical basis on which free-market theories were run and paved the way for a new economic theoretical paradigm “Keynesian Economics” that stresses the importance of aggregate demand on determination of output and employment levels and advocates state invervention to markets in order to create enough aggregate demand.

The emergence of Keynesian economics had repercussions on periphery intellectuals, economists and regional governing institutions like Economic Commission for Latin America (ECLA). ECLA was established by the UN as the result of a Chilean initiative in 1948. Latin American structuralism emerged in ECLA under intellectual leadership of Raul Prebisch who is the second executive secretary of ECLA. Structuralists stressed the importance of structural transformation of Latin American economies in favor of industrialization and the difficulty involved in breaking with economic model of primary-product exports. An unbalanced productive structure between periphery and center countries can decrease dependency on center countries (Mahon, 1992). Unbalanced productive forces manifest itself mostly in exchange relations between center and periphery as Prebisch-Singer hypothesis emphasizes the structural tendency for the terms of trade of periphery countries to deteriorate since epxorts are concentrated in primary commodities. Three factors observed by Singer and Prebish are (i) demand for commodities does not expand as industrial goods due to a lower income elasticity, (ii) industrial countries' exports include technologically sophisticated goods and its prices are incorporated in profits fron innovation, (iii) increase in productivity in center countries in higher wages due to rigid structure of labor markets and prices (Cyper, 2014; Vernengo, 2006).

For Latin American structaralist school the core development " was industrial growth and the ocnsequent absorption of the workforce into more productive manufacturing processses" (Martinussen, 1997, p. 74). According to Latin American structuralists, two important facts remain as obstacles in the path of an industrial development. Firstly, decreasing terms of trade for periphery countires and secondly, insufficient demand to support sustainable industrialization processes. Limited domestic demand and fierce competition in international markets constrain the potential of weaker manufacturer firms at periphery. Evans (1979), characterizes the structure of

periphery countries that is export oriented in commodities (primary) sector as that of “classical dependency”. In order to make domestic industrial production as competitive as foreign rivals, domestic economy must be protectd through high tariffs and public policies should be imposed to create sufficient domestic demandfor manufacutre sector. Latin American structuralists did not share the same pessimistic views of Neo-Marxists on the role of state and industrial policies. State-led import substitution strategies were advocated in order to overcome aforementioned structural obstacles on the way to industrialization of periphery countries.

The Great Depression and World War II interrupted traditional relationship between center and periphery countries. The disarticulation of Latin America, laid the foundation for import substitution strategies that were carried out in Post-War era. The Classical dependency era had formed middle income classes during the first three decades of twentieth century as the result of increasing jibs in service and industrial sectors. Growing demand from newly emerged middle classes for foreign goods, initiated attempts to subsititue these goods and thus industrial development. Following this transition period substitiuion strategies emerged as the outcome of both institutional and intellectual heritage of “classical dependency”. In this period, starting from the end of the World War II to 1980s, Latin American countries experienced highest and remarkable economic growth rates, 5.5 percent annually, and 2.7 percent per capital that had not been attained by these countries in their entire history (Bertola & Ocampo , 2013).

Protectionist policies and favorable commodity prices emboldened domestic private and public accumulation that consolidated the domestic market and financed the post-war era import substitution industrialization. These conditions created a new form of social structure of accumulation what Cardoso and Faletto (1979) called “development alliance” that is the alliance between industrial bourgeoisie, state bureaucracy and industrial workers against the interests of

exporting classes. The alliance had a remarkable success on reinvesting capital within the country, channeling foreign exchange to finance state-led inward looking industrialization, an improvement in income distribution and expanding managerial skills to organize production, advertisements and distribution to private sector under a political leadership that is “capable of reconciling the conflicting interests of the different groups in the interest of the nation” (Cardoso & Faletto, Dependency and Devleopment in Latin America, 1979, p. 131). The first oil crisis in 1973 and the end of the boom in export prices, accompanied the mature stage of “easy import substitution” due to “demonstration effect”. “Demonstration effect” is a concept derived by Cardoso and Faletto (1979), which explains the modernization of consumption patterns due to emergence of urban masses and industrial middle income classes. Demonstration effect “stimulates the importation of consumer goods orienting the utilization of savings to the payment of external producers, as well as induce investment in sectors that are not basic to the economy” (p. 12). These developments pave the way for political and financial transformations across Latin American countries. The development alliance was replaced by authoritarian regimes in order to repress the increasing economic and social demand of industrial working classes and associated middle classes. The domestic firms were subordinated by transnational corporation due to increasing demand for international finance as the result of unfavorable export revenues. The new social structure of accumulation attained limited success in economic growth and development. The limited success of authoritarian regimes and competition of transnational companies across Latin American countries and remarkable East Asian development under similar conditions stimulated a transformation in structuralist thought which can be coined as dependent development theory.

Dependent development theory or “associated dependent development” (Cardoso, 1973) emphasizes that the changing environment of international capitalist organization generated a new

international division of labor. Transnational corporations were moving force for these changes. In this kind of development pattern, the interests of transnational corporations fell in step with domestic welfare of the dependent country. This kind of development is also highly relevant to internal conditions of periphery countries which are characterized by the association of state, national capital and international capital (Cardoso, 1973; Evans, 1979; Cardoso and Faletto, 1979). Since development is defined as the "creation of a dynamic domestic sector capable of generating self-sustained growth…" (Cardoso & Faletto, 1979, p.8), it can be provided through the development of the domestic productive structure by means of transnational corporations. Dependency refers to "the degree of development of the political structure and the ability or not of local political elites to take economic decision into its own hands" (Vernengo, 2006, p.557). Consequently, development can still be sustained in association with foreign capital on the basis of the dependent nature of this association.

Dependent development theory also identifies institutions that enhance periphery countries' potential for bargaining with transnational corporations and center countries in building domestic technological capabilities. Dependent development theory represents a strong break from classical dependency and from structuralist schools. In this approach, external factors have a crucial role in the formation of power relations between social classes in the periphery. This role may vary with the alliances between local power groups. They conceive the relationship between internal and external factors "as forming a complex whole whose structural links … are rooted in coincidences of interests between local dominant classes and international ones…" ((Cardoso & Faletto, 1979, p. xvi)

The most important contribution of dependent development theory is that periphery countries had the potential for improving domestic productive structure through bargaining with

transnational corporations. In the conditions of dependency, periphery countries still can make progress economically and create a space for limited autonomy for policy choices. Dependent development theory also explained the relative success of Asian countries in industrialization. Mahon (1992) lists the structural differences between Latin American and Asian countries as; (i) "differing alignments of interests in civil society"[7] (ii) "power of the state over these societal interests"[8] (ii) "severity and duration of crises" (iv) "objective difficulty of an effective policy reorientation"[9] (Mahon, 1992, p. 246). While Asian countries continued as a good example for dependent development, the spread of financial liberalization and the increasing frequency of currency and debt crises after the eighties changed the focus of dependency discussions to financial dependency.

2.3.3 Financial Dependency

World War II left its destructive effects on every part of Europe and demolished the existing balance in international governance represented by British hegemony. In the post war period, several institutions were established to bring stability to Europe and the global economy. Economic stabilization was mainly a reflection of the search for global sustainability and discussions were centered around reshaping the international monetary system that would promote full employment and stable prices, while permitting countries individually to achieve external balances (Krugman, Obstfeld, & Melitz, 2015). As a result of the Bretton-Woods meetings, the International Monetary Fund (IMF) and International Bank for Reconstruction and Development

[7]Power relations among social classes, economic interest of multinationals and state administration etc. Equally distributed lands across Asian countries generated a social opposition against appreciation of domestic currency while, in Latin America, concentrated land ownership in the hands of landowners leads opposite of Asian case overvalued domestic current was supported by urban middle classes and industrial workers.

[8] Economically powerful and dominant states over powerful groups such as trade-unions, ex-landlords etc.

[9] Mainly wage costs.

(later known as World Bank) were established to govern international economic relations. IMF was established to finance and monitor countries that have balance of payments problem and follows expansionary public policies. The new structure of international financial governance was financed mainly by major creditor countries Britain, France and especially US. As the biggest creditor of international financial markets, the US increased her influence and institutionalized the dominance on IMF. Consequently, IMF's role was limited in ensuring global sustainability in international payments in the Post-War Bretton Woods period. This new international financial governing structure had three apparent properties that led to dollar hegemony as the international means of payment: the pegged adjustable exchange rates to US dollar, the capital controls that prevent national currencies from destabilizing effects of capital flows and the monitoring role of IMF. All national currencies were pegged to US dollar and adjustments monitored and allowed by IMF under specific conditions. Under these conditions, US dollar emerged as the international means of payments and countries became dependent to US dollar for external financing (Vasudevan, 2008; Eichengreen, 2008).

Bretton Woods system collapsed early 1970s due to cost pressures of 1973 oil shock, growing US external deficits and the huge pressure from financial institutions on US monetary policy making institutions to eliminate capital controls under Eurodollar markets competition. After elimination of capital controls and aggressive monetary policy of Federal Reserves under Volker's term, interest rates are hiked at late 1970s and a competition for speculative flows have started globally. These developments did not affect the hegemonic power of US dollar, on the contrary they strengthened its power as an international reserve currency. US monetary policy started to have a determinant role in global finance.

International financial liberalization waves transformed the environment of capital flows to Latin American countries. Vernengo (2006) states that the persistent and high growth rates under ISI period was the joint outcome of both strategies of developmental state and favorable environment of restricted capital flows and stable exchange rates. Capital controls and adjustable fixed exchange rates kept foreign debts under control. After first oil shock and increasing liquidity as the result of recycling petrodollars, Latin American foreign debt exploded. Mexico, Brazil, Venezuela and Argentina own the 75 percent of total third world foreign debt (Vasudevan, 2008). The bonanza of capital was ended with the hike in US interest rates as the result of Paul Volker's chairman of the Federal Reserve Board, tight monetary policy decision. That fact in turn resulted with the "Lost Decade" of Latin American countries which is the series of debt crises among Latin American countries. After this period, the possibility of having higher growth rates became dependent on the ability of attracting foreign capital to the domestic economy by means of higher rates than US interest rates. The dependence of Latin American countries on capital flows and dollar liquidity is an indicator of a dependent relation that does not derive from and unbalanced productive structure between periphery and center countries. This new nature of dependency was defined by Tavares as "international money – and not technical progress – as the expression of financial capital domination over the periphery in the last 150 years". (Vernengo, 2006, p. 553)

Financial dependency theorists were related with the Universidade of Campinas and Universidade Federal do Rio de Janerio under the intellectual leadership of Maria da Conceicao Tavares (Vernengo, 2006). Financial dependency studies do not see the core of the problem as technological differences between the center and periphery, as distinct from classical dependency and development theorists. In a similar way to classical dependency, financial dependency theories claim that external forces critically determine dependent relations. However, they perceive

dominance as arising from finance not technological differences. Technology is not the cause but a result of expanding demand. Therefore, the same dependence relationship lies elsewhere. According to Tavares, this new nature of dependency is the outcome of hegemonic power reflected by the hegemony of the dollar. The most important factors that limit growth rates are lack of finance, specifically foreign finance, and balance of payments constrain that are mostly determined by US monetary policy (Vernengo, 2006).

2.3.4 Two Paths to Dependency

Financial dependency theorists provide an important contribution to dependency theories through drawing attention to financial constraints on development. While the theory explains main facts about Latin American development, it does not fit to the Asian development Asian development as it is shown at Figure 2.2 and following figures 2.3 and 2.4, dependent on capital controls and created a relatively greater policy space for monetary institutions of Asian countries. Relative financial independence of Asian countries is the result of structural factors that are inherent in Asian development path that can be considered as “dependent development”, as multinational corporations play an active role active role in promoting exporting sectors. Export oriented strategy or “dependent development” as an alternative to financial dependency is not free from demand constraints. The most important limitation is the world demand for Asian products. These two paths to dependency are further investigated in the following section.

2.4 Major Demand Contributions to Growth

Major demand contributions to growth can inform of different sources of growth among Latin American and Asian countries. Different sources of growth for these two set of countries is the outcome of their dependent relationship to center countries. This section illustrates major demand contributions for Latin American and Asian periphery countries.

External shocks affect domestic economies through channels of international trade and finance in the era of globalization. The effect can be seen when major demand contributions to growth is analyzed. Demand contributions to the growth rate can be calculated through equation (2.1).

$$\frac{\Delta Y_t}{Y_{t-1}} = \frac{\Delta C_t}{C_{t-1}} \times \frac{C_{t-1}}{Y_{t-1}} + \frac{\Delta G_t}{G_{t-1}} \times \frac{G_{t-1}}{Y_{t-1}} + \frac{\Delta I_t}{I_{t-1}} \times \frac{I_{t-1}}{Y_{t-1}} + \frac{\Delta IN_t}{IN_{t-1}} \times \frac{IN_{t-1}}{Y_{t-1}} + \frac{\Delta TB_t}{TB_{t-1}} \times \frac{TB_{t-1}}{Y_{t-1}} \quad (2.1)$$

In equation (2.1), $Y_{t,}\ C_t, G_t, I_t, IN_t$ and TB_t refers to real GDP (by expenditure), household consumption expenditure, government expenditure, investment expenditure (gross fixed capital formation), change in inventories and trade balances respectively. Each element in the right-hand side of equation (2.1) means the growth of particular demand contributes to total growth with respect to its share in total GDP. Figure 2.6 illustrates major demand contributions to growth rate among Latin American countries between 1990 and 2014.

According to Figure 2.6, Latin American countries experience positive contribution from trade balances only during the contraction periods and in expansionary periods trade balances negatively contributes to growth rates of these countries. In other words, the growth capacity of Latin American countries is bounded with trade deficits. Thus, any shock that effects trade balances also constrain their growth potentials and lead problems in international payments.

Figure 2.7 illustrates the results for Asian countries. Asian countries, except China, had experienced a similar relationship between trade balances and growth with Latin American countries, till 1998 Asian Crisis. After the crisis, these countries accelerated application of capital controls and after 1998 crisis the trajectory is reversed for Korea and disappeared in Thailand and

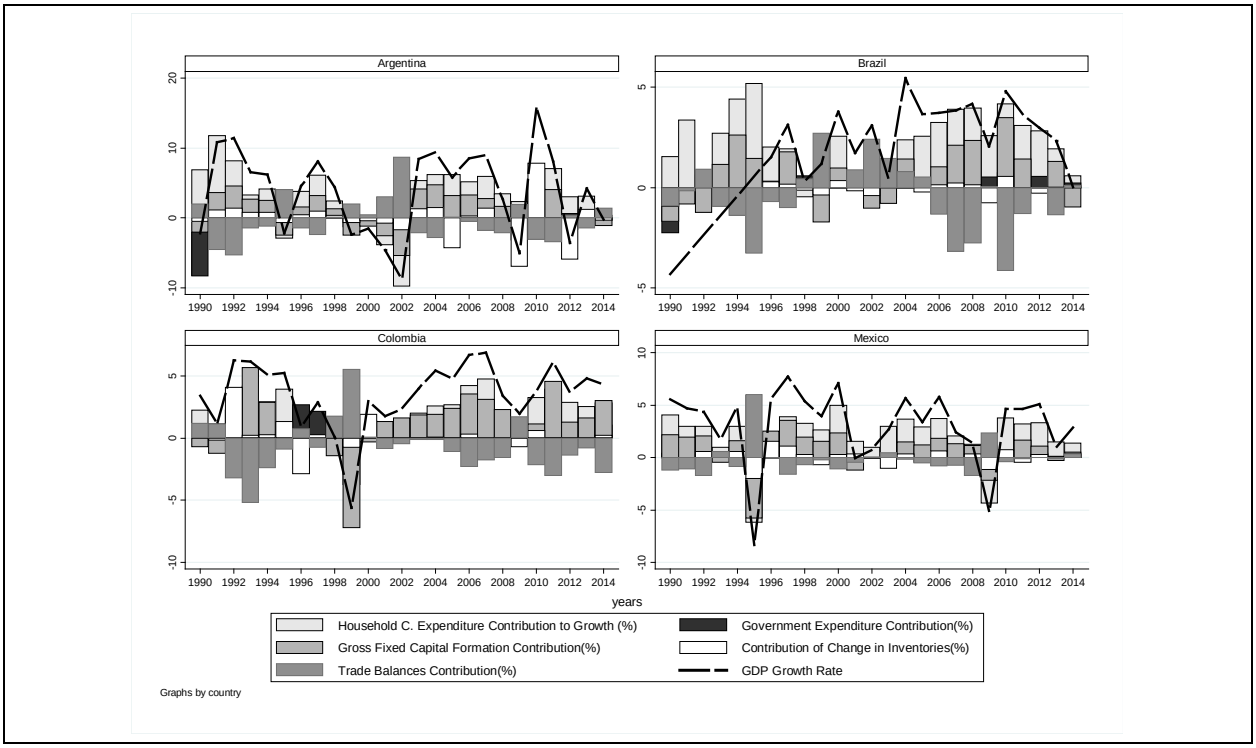

Figure 2.6: Major demand contributions to growth, Latin American Countries
Source: UN, World Development Indicators

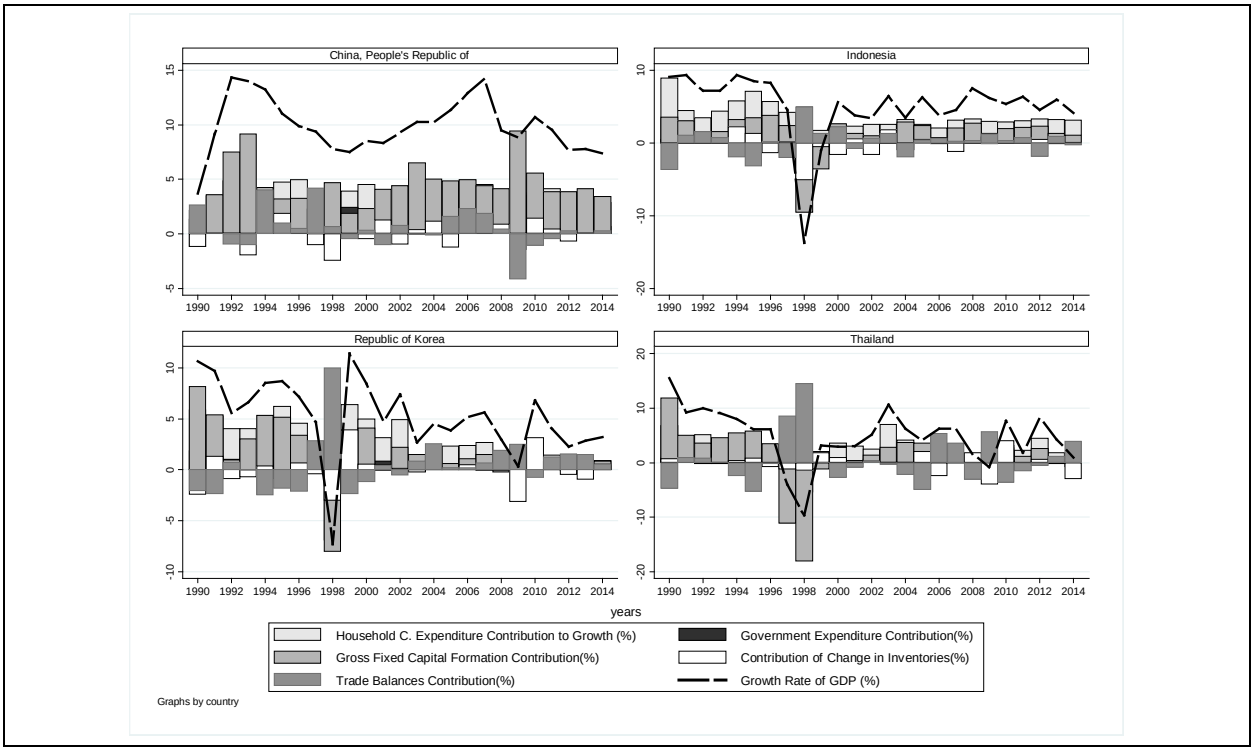

Figure 2.7: Major demand contributions to growth, Asian Countries
Source: UN, World Development Indicators

Indonesia. In China, positive contributions of trade balances to growth are effective in high growth periods, but gross fixed capital formation stands as the most important contributor.

Another striking difference between Asia and Latin American countries is the contribution of household expenditure. Among Latin American countries, expansionary periods are associated with increasing levels of household expenditure. This pattern become more important when negative trade balances are considered. Negative trade balances associated with higher household consumption expenditure shows that growth of Latin American countries does not have the potential for future export revenues and mostly constrained by domestic demand. However, low level contribution of household expenditure and associated positive trade balance contribution among Asian countries indicates that growth has the potential for increasing exports and trade surpluses.

In both regions, growth is open to shocks from abroad. In the Asian case, a decrease in world demand can affect the growth rate through decreasing trade balances. In other words, growth is bounded by their ability to export. In the Latin American case, the domestic market oriented growth is linked to domestic demand and international capital flows that finance the current account gaps arise from higher trade deficits. In both cases shocks to current account balances can inform researchers about differences in dependent relations of Latin American and Asian countries.

The difference between major demand contributors of Latin American and Asian countries is the result of differences in structural savings among these countries. Higher saving rates can reduce the household domestic consumption and increase the opportunity to export demand surplus abroad. Additionally, higher structural savings can make periphery countries resilient to financial dependency and can create a greater policy space to cope with speculative capital inflows

and to direct foreign capital to productive sectors. The following section investigates structural savings of these two group of countries and gives the account of differences in saving policies to increase structural savings in Asian countries. The section stresses the importance of saving policies alongside with industrial policies as a development policy.

2.5 Structural Savings and Financial Dependency

Higher savings allow periphery countries to direct domestic investment and trade policies relatively more independent to foreign capital and to be more selective in compatible foreign investments with the aim of development (Kohli, 2012). Figure 2.8 illustrates the gross domestic savings as percentage of GDP among Latin American and Asian countries between years 1980 and 2014.

The high difference between saving rates in Asian and Latin American countries is important to note. Between 1980 and 2008, domestic savings of Asian countries is substantially

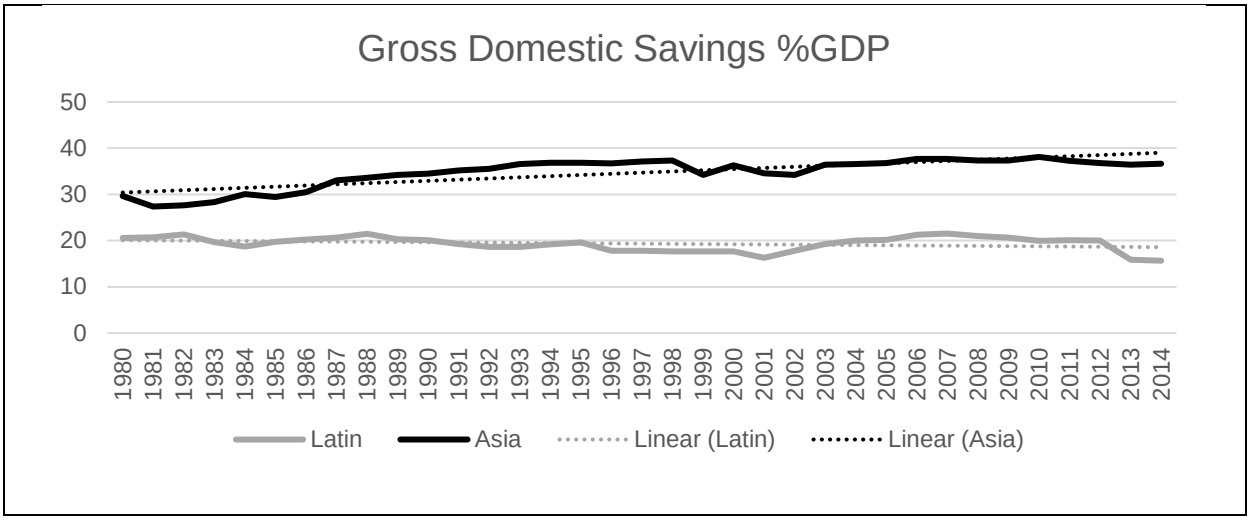

Figure 2.8: Gross Domestic Saving Rates for Latin American and Asian countries
Source: WDI, World Bank[10]

[10] Gross domestic saving (%GDP) per region is calculated as the average of all countries in the region. Latin American countries consist of Argentina, Brazil, Chile, Colombia, Costa Rica, Guatemala, Mexico, Panama, Uruguay, while Asian countries consist of China, Indonesia, Malaysia, Korea and Thailand. Trade openness index of the region is

higher than Latin American countries. Latin American countries' trend saving rates are almost constant around twenty percent of gross domestic product while trend saving rates of Asian countries substantially increased from thirty percent of gross domestic product to forty percent. Gross domestic saving rate do not inform about the saving rates required to finance domestic investments. Financial balances of a country inform researchers about private sector financial surplus that is available for domestic investments. Private sector financial balances can be investigated following the methodology of Godley, Izurieta and Zezza (2004);

$$Y_t = PX_t + G_t + NX_t \tag{2.2}$$

Equation (2.2) refers to the canonical decomposition of GDP by expenditure as real GDP (Y_t) is equal to sum of private expenditure (PX_t), government expenditure (G_t) and net exports (NX_t). Equation (2.3) is obtained by subtracting private expenditure, government revenues (GR_t) from equation (2.2) and adding current transfers from abroad ($TRFD_t$) to the equation (2.2).

$$Y_t - GR_t - PX_t + TRFD_t = (G_t - GR_t) + (NX_t + TRFD_t) \tag{2.3}$$

The left-hand side of equation is the private sector's financial surplus (PNS_t), first element at the right side of the equation is net government expenditure or negative value of government deficit ($PSBR_t$) and finally the second element is the current account balances (CA_t).

$$PNS_t = PSBR_t + CA_t \tag{2.4}$$

Equation (2.4) says that current account surpluses and higher net government expenditure (negative of government deficits) both generate financial assets for private sector. Countries have lower demand for international flows when they have private sector financial surpluses that are generated through high current account surpluses. Countries experience private sector's financial deficits are desperately dependent to capital flows to finance their domestic investments and

calculated through percentage share of sum of total exports and total imports of each country in sum of GDP levels of each country in the region.

expenditures. This decomposition also has an advantage in investigating sources of private financial surpluses. Figure 2.9 illustrates the decomposition for both Asian and Latin American countries.

According to Figure 2.9, Asian countries except Malaysia generates their private surpluses through lower government deficits associated with high and persistent levels of current account surpluses. Contrarily, Latin American countries' have two different trends. The first is a trend of high correlation of private sector financial deficits with current account deficits. Countries (such as Panama, Costa Rica, Guatemala and Uruguay) that have stable and disciplined fiscal balances are constrained by the negative current account balances, which deepens the financial dependency of these countries. The second trend is that higher private sector financial balances are associated with higher government deficits. Some Latin American countries (such as Argentina, Brazil, Mexico and Colombia) can generate private sector financial surpluses despite their lower or negative current account surpluses through expansionary government policies. This policy may create financial surpluses but it is not sustainable as it is experienced at debt crises of Latin American countries at early 1990s and former periods. Consequently, in both cases Latin American countries need international capital flows to finance their domestic investments. This has been illustrated in Figure 2.5. The share of foreign investments in gross fixed capital formation increases through time among Latin American countries while the trend for Asian countries remain almost constant during 24-year period between 1990 and 2014. This again shows that investments are more dependent on foreign investments in Latin American countries.

Lower domestic saving rates are accompanied by increasing foreign direct investments that do not have potential for future export revenues, increasing the financial dependency of Latin

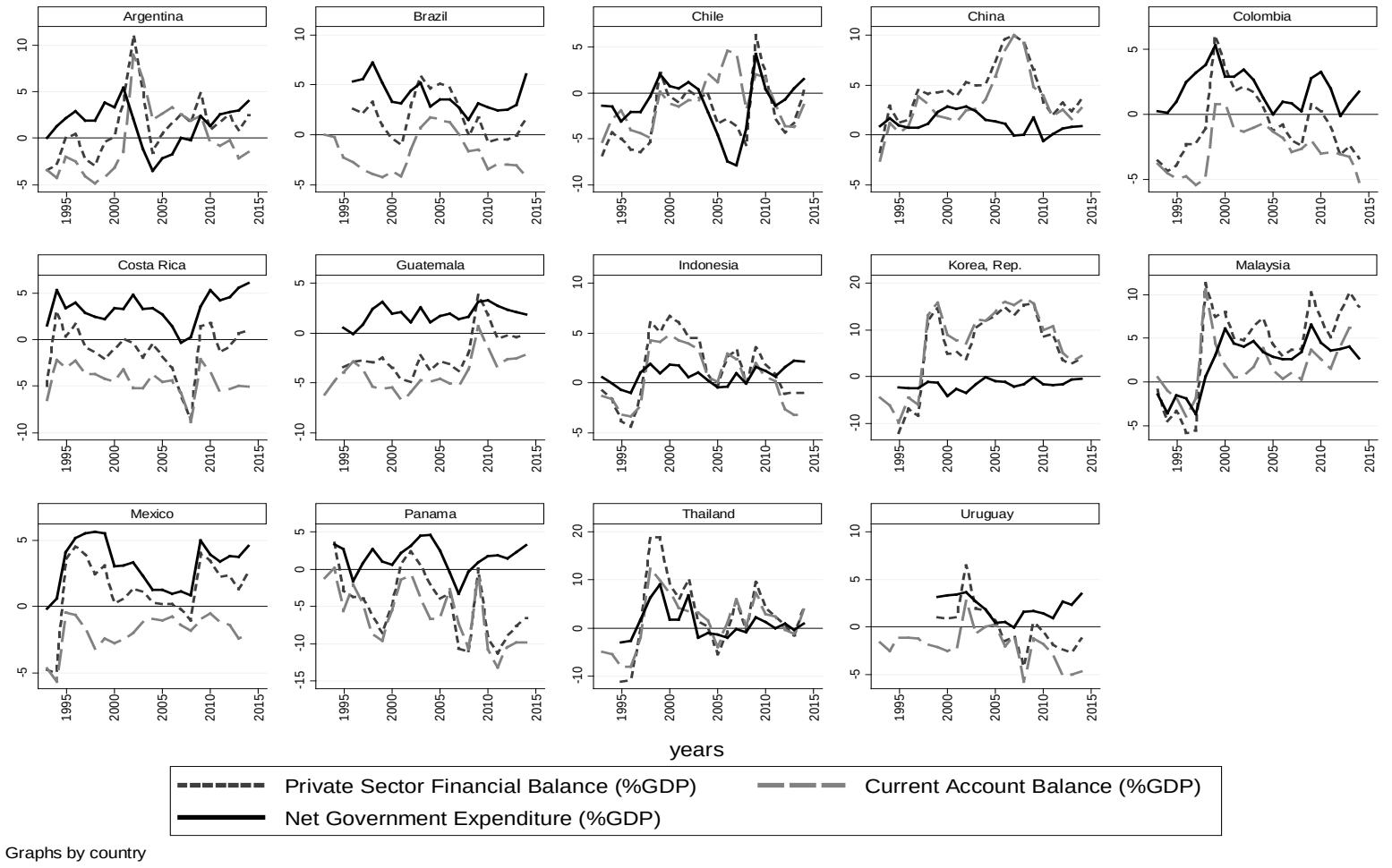

Figure 2.9: Private Sector Financial Balance (%GDP), Net Government Expenditure (%GDP), Current Account Balances (%GDP)
Source: World Bank, World Development Indicators

American countries. This dependency constrains their growth potential. Asian countries, however, decrease the need for international finance due to financial surpluses and saving rates.

Asian countries have the chance to finance their domestic investments through domestic savings and to direct foreign capital to exporting sectors. The structural increase in saving rates among Asian countries is the direct result of policies targeting household savings, alongside with industrial policies. Next section investigates these saving policies which led Asian countries to decrease their financial dependency and be selective in capital flows through capital controls.

The structural increase in saving rates among Asian countries is the direct result of policies targeting household savings, alongside with industrial policies. Next section investigates these saving policies which led Asian countries to decrease their financial dependency and be selective in capital flows through capital controls.

2.5.1 Saving Policies

The higher saving rate of Asia has been the center of discussion. Many works attributed importance to cultural differences or habit formations between Asian and Latin American countries (Carroll, Overland, & Weil, 2000). The rising saving rates in Asia, in contrast to stagnating saving rates among Latin American countries, cannot be explained through cultural differences. While, cultural factors or habitual formations may have explanatory power on the gap in the savings rates. They cannot explain the increasing trend in saving rates through time. Rather, it is government intervention on savings behavior that is a key factor for improving saving rates among Asian countries (Kohli, 2012; Elson, 2013).

Several factors explain the difference between Asian and Latin American saving rates beside macroeconomic stability such as stable real interest rates, mobilization of domestic savings

(national postal savings etc.), different types of pension fund schemes, constraints on consumption credits, demographic transition and income inequality (Elson, 2013).

Stable and consistent positive interest rates are an important factor in saving decisions. During the period between 1997 and 2014, variance of real lending rates is found as 47.08 for Latin American countries and as 5.97 for Asian countries. In the same period, average saving rate of Asian countries 36.6 and Latin American countries' saving rates 18.25. Stable interest rates are the result of monetary policies and controlled interest rates that are usually set below the market clearing levels (Rodrik, 2007).

In addition to stable and positive lending rates among Asian countries, small savings mobilization through national savings organization is also important (Adams, 1978). Two models are striking among the Asian countries we studied. First is the postal savings bureau as in Republic of Korea and China, and second is employment of the postal infrastructure by the national saving banks as in Malaysia.

In China, the Postal Savings and Remittance Bureau initiated with the assistance of the People's Bank of China, where has an important role in mobilizing the savings derived from individual income and profits as the outcome of private sector activities (Scher, 2001). Postal savings system in South Korea dates to the late 19th century. First, national postal administration was established in 1884 and postal savings activities started in 1962 after Postal Savings Law was legislated. Except during the period between 1977 and 1983, Korea Post Service's saving programs successfully mobilized agricultural savings (Mayeda, 2008). In the case of Malaysia, publicly owned national saving bank employed postal network in regions where establishing new branches are not feasible. National saving bank in Malaysia utilized a two-tier system and employed regular

competitive banking activities in the urban areas while it was relying on postal services and network in rural areas.

The examples of national postal savings show that government action/public policy is of the essence because privately owned banking and saving institutions are not successful enough in mobilizing small savings of agricultural producers or disadvantaged urban workers. Latin American countries failed in the task of mobilization of savings even in the period of advantageous position following easy import substitution industrial policies.

Another principal factor that effects the differences in saving rates between Asian and Latin American countries is demographic transition and the setting up of pension fund schemes compatible with the transition. Demographic transition refers to a change from high rates of mortality and fertility to low rates. The medium-term effect of the transition is a decline in dependency ratio and an increase in available labor force. In this sense, lower fertility and increasing number of working population increases household savings. A lower dependency rate, due to low birth rate makes more savings available for future income (during retirement) for contemporary young workers. However, in the long-term, overall dependency associated with ageing population will increase and available labor force will decrease, both of which results in lower levels of savings and investments. Since capital flows reflect the country's net financing requirements (savings minus investments), demographic transition becomes an important factor in determination of capital flows (Moreno & Santos, 2008).

Table 2.1 illustrates dependency ratios associated with old and young populations for Latin American and Asian countries. A decrease in the dependency ratio alongside an increase in old dependency ratio refers to a demographic transition. East Asia experienced a demographic transition dramatically during twentieth century. Latin American countries also experienced

Table 2.1: Young and old dependency ratio as the percentage of total working population for Latin American and Asian countries

Source: World Bank, World Development Indicators

Dependency ratio associated with young population (% of total working population)			Dependency ratio associated with old population (% of total working population)		
Years	**Latin America**	**Asia**	**Years**	**Latin America**	**Asia**
1966-1980	71.17746	75.81281	1966-1980	8.641549	6.481454
1981-1995	60.33173	53.4225	1981-1995	9.758072	6.950135
1996-2010	48.13006	37.69101	1996-2010	11.44584	9.253536
2010-2014	40.55325	30.23538	2010-2014	12.89829	11.43633

slower transformation than Asian countries as they were lagging due to discouragement of family planning techniques by the dominant catholic tradition (Bloom & Williamson, 1998; Elson, 2013). Despite unfavorable religious components, Bloom and Williamson (1998) estimated that high growth rates in real output per capita among Asian countries could be attributed to domestic savings and growth in labor force associated with demographic transformation. However, demographic transition did not result in higher savings in Latin American countries. Cavallo, Sanchez and Valenzuela (2016) test the relationship between demographic factors and saving rates among 110 countries between 1963 and 2012 and find that a lower dependency ratio and higher longevity positively affect saving rates. However, this relationship is only robust among Asian countries and not significant for Latin American countries. This shows that demographical transition may not influence household savings without compatible economic policies which can increase the share of savings in income.

The different outcomes of demographic transition on savings among Asian and Latin American countries can be attributed to different pension systems applied. Latin American countries under investigation, except Chile and recently Argentina, imposed defined benefit basis

schemes. In contrast, Asian countries imposed a mixture of defined contribution basis pension schemes (Park, 2012; Stiglitz & Uy, 1996; Mesa-Lago, 2006). Bloom et al. (2007) show that increasing longevity does not have any effect on savings of countries with defined benefit based pension schemes. However, the effect of penstion systems on saving rates among corresponding countries in conclusive, because there are many countries in both regions that employ both defined benefit and defined contribution schemes.

Another important factor that lead to higher savings rate among Asian countries is credit constraints in those countries throughout the most of the second half of the twentieth century. Lack of consumer credits to finance household expenditures on housing, consumer durables and other consumer goods have a strong effect on savings. Maki (1993), shows that as household incomes and demand for durable consumer goods and housing increases, savings as a share of disposable income also incerases in Japan. Boyoumi (1993) and Miles (1992) show the effect of financial liberalization in reducing savings in UK. Zhang and Zoli (2016) also state that housing related macro-prudential instrumetns such as loan to value caps and housing tax measures bring credit growth under control at Asia.

Saving rate is one of the main differences between Asian and Latin American countries that is the result of effective mobilization of rural savings, stable real interest rates, macro-prudential measures on consumption and related credit constraints and finally, the instituting of pension systems with demographic transition. Higher saving rates implies an independence for periphery countries in financing their growth and makes these countries selective in options of capital flows. In these type of peripheral countries, finance-led growth may be kept in check. Higher saving rates also creates domestic demand problem. Higher savings decreased the extent of domestic markets and form a basis for export-led growth strategy for Asian countries. Through

higher savings, Asian countries generated investments that is required for export upgrade continuously. Palma (2009) addresses several factors that led to a more elastic and growth-enhancing set of comparative advantages. Most important factor is their ability to upgrade exports continuously in line with the flying geese path. Their success depended on generating enough domestic savings needed for this supply upgrade.

Since the export-led growth was successful through limiting domestic markets and mobilizing savings. Asian growths become more and more dependent to world demand for their export goods. Several interruptions from consumption demand of center countries left Asian countries with negative growth rates and stagnation. Different patterns of dependency in Asia and Latin America lean their vulnerability to external shocks in distinct ways. While Asian countries are more vulnerable to external demand shocks through trade links, Latin American countries are more vulnerable to financial shocks from abroad. In the following section this vulnerability is illustrated through the effects of external shocks to current account.

2.6 Vulnerability to External Shocks

In this section, the impact of external shocks on the current account are investigated by decomposition of current account balances. These shocks are identified as “terms of trade effect”. “world trade effect”, “interest rate effect” and finally the effect of capital flows on overall current account balance. First three shocks are derived from subaccounts of current account while last one derived from financial account. Relative importance of these shocks in the change in current account balance provides some insight about the nature of dependency for corresponding country.

External shocks to current account balances can be calculated through decomposition approach. This approach was first employed by Balassa (1983) and the technique relates changes in current account to changes in the main current account items from their trend levels. Bacha

(1986) modifies the model that explains the change in the current account on the basis of a year through decomposing the changes in all components of current account balances with respect to this base year.

In this work, only a simple and stylized current account decomposition is presented due to limitations arising from data availability of countries that are analyzed. Three external shocks are defined as “terms of trade shock”, “world trade shock” and “interest rate shock”. These three shocks correspond to three types of dependency that are “classical dependency”, “dependent development” and “financial dependency”, respectively.

The method applied to four countries from each region. South Korea, China, Indonesia, Thailand are chosen from Asia and Argentina, Brazil, Colombia, Mexico are chosen from Latin America. These four countries from two regions are top four in GDP ranking at the corresponding regions.

2.6.1 Method

Current account balances can be decomposed as follow;

$$CA_t = EX_t + R_t + T_t - IM_t - V_t \tag{2.5}$$

In equation (2.5) current account balance (CA_t) is defined as the difference between sum of exports of goods and services (EX_t), net receipts of private transfers (R_t), net of official transfers (T_t) and sum of imports of goods and services (IM_t) and net factor payments (V_t). Exports of goods and services can be defined as;

$$\begin{aligned} EX_t &= P_t^x . X_t \\ &= P_t^X . \frac{X_t}{W_t} . W_t \\ &= P_t^x . x_t . W_t . \end{aligned} \tag{2.6}$$

Following from Balassa (1983), exports are simply defined as the product of the export deflator (P_t^x), the share of exports in total world trade (x_t) and world trade (W_t). Export functions are decomposed in a more sophisticated way in many works. Bacha (1986) decomposes Brazilian exports into coffee export, as the main export good, and other exports and includes the effect of the change in export structure on current account balances. White and Kelegama (1992) defines export and import prices in local currency and calculates the exchange rate shocks on current account balances. Limitations on data availability prevents a more detailed analysis in this work.

Imports of goods and services can be written as in equation (2.7).

$$\begin{aligned} IM_t &= P_t^m . M_t \\ &= P_t^m . \frac{M_t}{A_t} . \frac{A_t}{A_t^*} . A_t^* \\ &= P_t^m . m_t . b_t . A_t^* \end{aligned} \tag{2.7}$$

Imports are defined as the product of import price deflator (P_t^m), the ratio of imports to real domestic absorption (m_t), ratio of real absorption to its trend value (b_t) and finally trend value of real domestic absorption (A_t^*). As in the case of exports, imports are decomposed more sophisticatedly in previous works for single country cases. Bacha (1986) identifies three components of Brazilian imports such as “oil imports”, “capital goods imports” and “other imports” and detects the effect of the change in import structure. Factor payments are decomposed into interest payments (V_i) and other factor payments (V_d).

$$\begin{aligned} V_t &= V_{it} + V_{dt} \\ &= r_t . F_{t-1} + V_{dt} \end{aligned} \tag{2.8}$$

In equation (2.8) total factor payments are decomposed into total interest payments as the product of interest rate (r_t) and total foreign debt in previous year (F_{t-1}) and other factor payments.

When (2.6), (2.7) and (2.8) are substituted into equation (2.5) current account balances can be defined as follow;

$$CA_t = P_t^x . x_t . W_t - P_t^m . m_t . b_t . A_t^* - r_t . F_{t-1} - V_{dt} + R_t + T_t \quad (2.9)$$

Current account balances can be normalized by dividing nominal GDP ($Y_t = P_t^y . Z_t$) both sides of equation (2.10). Nominal GDP is the product of GDP deflator (P_t^y) and real GDP (Z_t). By dividing both sides of equation (2.6) to $P_t^y . Z_t$ the equation can transform as follow;

$$\frac{CA_t}{Y_t} = \frac{P_t^x}{P_t^y} . x_t . \frac{W_t}{Z_t} - \frac{P_t^m}{P_t^y} . m_t . b_t . \frac{A_t^*}{Z_t} - r_t . \frac{F_{t-1}}{Y_t} + \left(\frac{R_t + T_t - V_{dt}}{Y_t}\right) \quad (2.10)$$

In order to calculate shocks to current account, first difference of (2.10) has to be taken and changes in current account balance can be illustrated as follow;

$$\begin{aligned}
\Delta\left(\frac{CA_t}{Y_t}\right) = & \left(x_{t-1} . \frac{W_{t-1}}{Z_{t-1}} . \Delta\left(\frac{P_t^x}{P_t^y}\right) - m_{t-1} . b_{t-1} . \left(\frac{A_{t-1}^*}{Z_{t-1}}\right) . \Delta\left(\frac{P_t^m}{P_t^y}\right) \right) \\
& + \left(\left(\frac{P_{t-1}^x}{P_{t-1}^y}\right) . x_{t-1} . \Delta\left(\frac{W_t}{Z_t}\right) \right) - \left(\frac{F_{t-2}}{Y_{t-1}} . \Delta(r_t) \right) + \left(\frac{P_{t-1}^x}{P_{t-1}^y} . \frac{W_{t-1}}{Z_{t-1}} . \Delta x_t \right) \\
& - \left(b_{t-1} . \left(\frac{A_{t-1}^*}{Z_{t-1}}\right) . \frac{P_{t-1}^m}{P_{t-1}^y} . \Delta m_t \right) - \left(m_{t-1} . \left(\frac{A_{t-1}^*}{Z_{t-1}}\right) . \frac{P_{t-1}^m}{P_{t-1}^y} . \Delta b_t \right) \\
& - \left(m_{t-1} . \frac{P_{t-1}^m}{P_{t-1}^y} . b_{t-1} . \Delta\left(\frac{A_t^*}{Z_t}\right) \right) - \left(r_{t-1} \Delta \frac{F_{t-1}}{Y_t} \right) + \Delta\left(\frac{R_t + T_t - V_{dt}}{Y_t}\right) \\
& + Interaction
\end{aligned} \quad (2.11)$$

The first element in the right-hand side of the equation (2.11) in brackets is defined as "terms of trade shock", second element as "world trade shock", third element as "interest rate shock". These first three shocks are coined as external shocks. Following fourth element in bracket is "export penetration effect", fifth is "import replacement effect", sixth is "expansion/recession effect", seventh is "changes in average absorption propensity effect", eight is "debt burden effect"

and last two elements are “other transfers effect” and interaction effects that may arise from merging the data together.

2.6.2 Terms of Trade Effect

$$\left(x_{t-1}.\frac{W_{t-1}}{Z_{t-1}}.\Delta\left(\frac{P_t^x}{P_t^y}\right)-m_{t-1}.b_{t-1}.\left(\frac{A_{t-1}^*}{Z_{t-1}}\right).\Delta\left(\frac{P_t^m}{P_t^y}\right)\right) \quad (2.12)$$

Terms of trade effect is the share of total changes in current account balances that is attributable to changes in relative price of exports and relative price of imports. World total trade, W_t, in constant price is calculated as the sum of real exports and imports that is retrieved from GDP in constant prices by expenditure,Z_{t-1}. The share of domestic country’s total exports in world total trade, x_t, is calculated as the total exports of domestic in constant prices. Real absorption, A_t, is calculated as the sum of final household consumption expenditure, gross domestic capital formation and government expenditure. Trend component of A_t, A_t^* ,is calculated using the *Hodrick–Prescott* filter. The ratio of total imports to real absorption, b_t, is calculated as real imports, M_t, divided by A_t. Data sources are downloadable from United Nation’s database and permanent links of the data is shared in Appendix 2.

An increase in relative export prices, while imports prices stay constant can increase export revenues and contribute current account balances positively. Conversely, an increase in relative import prices contributes negatively to current account balances, keeping relative export prices constant. An improvement in terms of trade that means increasing relative prices accompanied by less increasing or decreasing relative prices of imports, leads an improvement in current account balances, vice versa. Thus, the relationship between current account balance and its terms of trade component has to be positive.

Figure 2.10 illustrates change in the Current Account as a percentage of GDP and its terms of trade shock components during the period between 1990 and 2014. Negative terms of trade movement is associated with positive changes in the current account balances among Latin American countries, while positive relationship between terms of trade and current account balance is apparent in very short term among Asian countries. However, it is hard to tell that changes in current account balances and terms of trade move together among each country group. This fact also corresponds to discussions about changing nature of dependency between center and periphery countries. As mentioned earlier, classical dependency stresses the importance of deterioration in terms of trade in sustaining the unbalanced productive structure between center and periphery countries. However, the sharp decline in terms of trade, as the result of deterioration

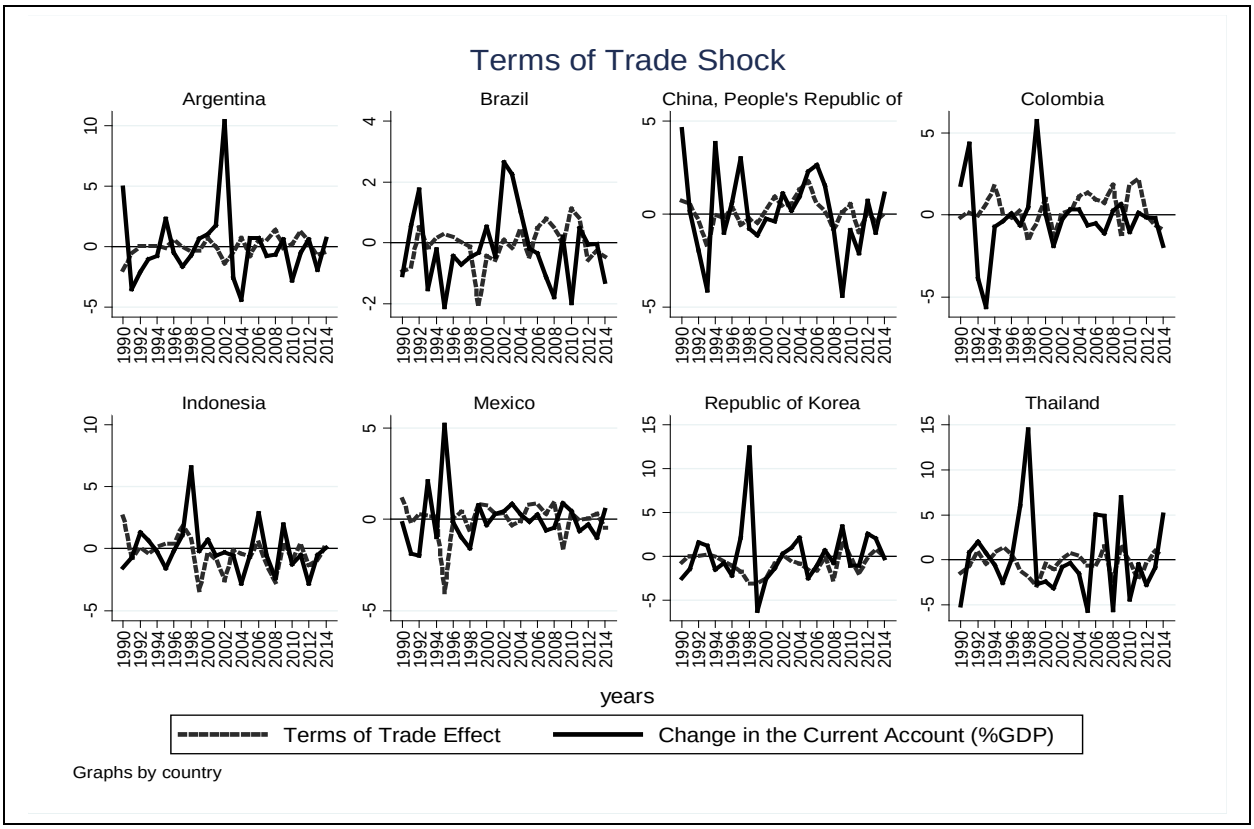

Figure 2.10: Terms of trade shocks and change in current account balances among selected Asian and Latin American countries.
Source: UN, World Development Indicators

in relative export prices, does not necessarily lead decrease in current account balances. While this result by itself does not give enough information about the change in the unproductive structure, but it does suggest that current account shocks are not driven by terms of trade effects.

In Latin American case, negative terms of trade shocks are associated with positive current account balances. The most important reason for this is the dependence of household expenditures on imports. An improvement in terms of trade results with cheaper import prices and that increases demand for these goods. This fact can be attributed to the price elasticity of export goods and income elasticity of import goods in the same manner with Prebisch-Singer hypothesis. An improvement in terms of trade increases export level of these countries, however resultant higher income leads more of importation of foreign goods. Figures 2.11 and 2.12 present the terms of trade, ratio of exports and imports to GDP for Latin American and Asian countries, respectively. Terms of trade is calculated as the ratio of export price and import price deflators.

Figure 2.11 shows the terms of trade, export and import shares in GDP level for Latin American countries. In Argentina, before 2001, the import share was higher than the export share throughout period. After 2002, this pattern changes and increasing terms of trade appear alongside export shares are higher than import shares. However, exports started to decline under favorable export prices after its peak level at 2002. Meanwhile, imports seem increasing slowly under favorable terms of trade. A similar tendency is valid for Brazil. An increase in terms of trade is accompanied by increasing import and export shares, however, after 2002, export shares continue to increase under favorable terms of trade conditions while import share remained relatively constant between 12 and 14 percent of GDP. After 2008 crisis, the increasing terms of trade index is accompanied with higher import demand than export supply. Colombia and Mexico experiences

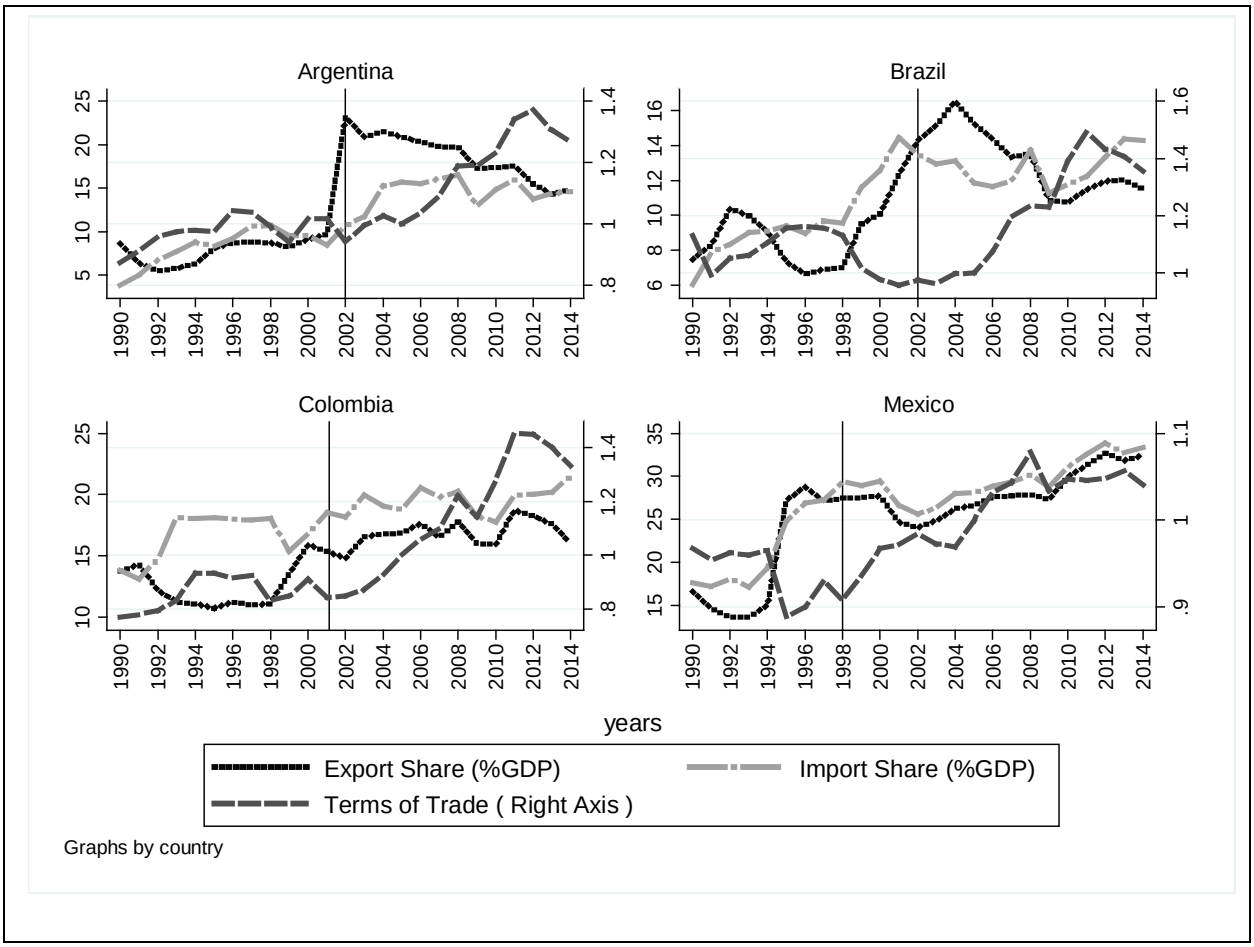

Figure 2.11: Terms of Trade, Export Share (%GDP) and Import Share (%GDP) for selected Latin American countries.
Source: UN, World Development Index

increasing terms of trade since 1998, commodity boom, however the increase in import share is higher than export share.

Figure 2.12 illustrates the same variables for selected Asian countries. In the Chinese case, despite a deterioration in the terms of trade index since 1997, both export and import shares increase, but the export shares exceed import shares.

Both shares tend to decline with terms of trade deterioration after 2008, however export shares still exceed imports. After Asian Crisis, terms of trade index of Indonesia increased sharply and started to decline, thus export share and import share have both decreased. During the same

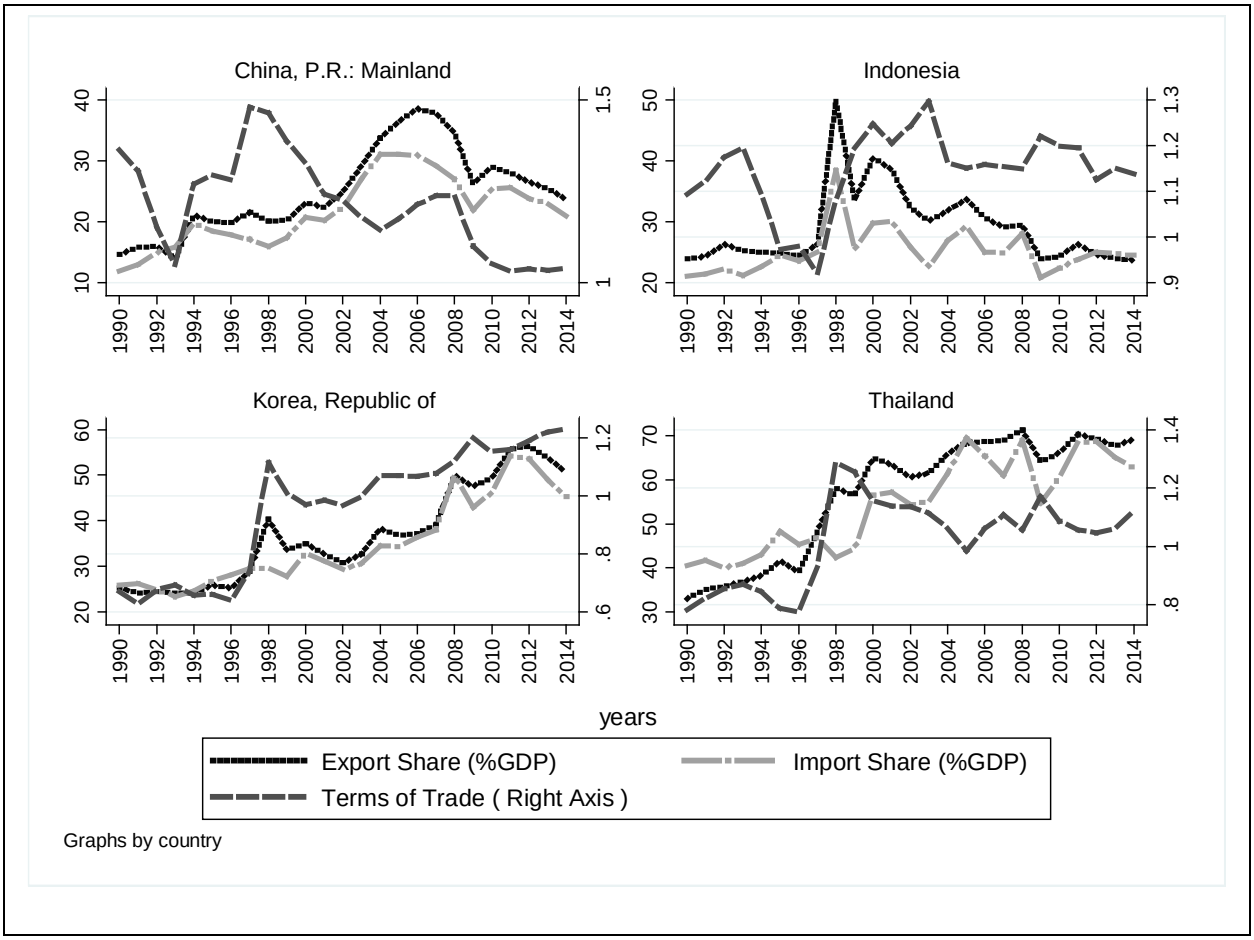

Figure 2.12: Terms of Trade, Export Share (%GDP) and Import Share (%GDP) for selected Asian Countries

Source: UN, World Development Index

period, export shares exceeded import shares. In the case of Korea, increasing terms of trade are associated with increasing export and import shares, while export shares are higher than import shares. In Thailand, before the Asian crisis, as terms of trade increases, import shares increase more than export shares in the way that Latin American countries experienced. However, the trajectory changed after crisis and export shares started to increase higher than import shares.

Different impacts of terms of trade on the vulnerability of two different economies suggest a divergent dependent relationship between these countries and center countries. In Latin American countries, since domestic demand and growth are bounded with the ability to import, an

increase in terms of trade results in an increase in import demand. This explains the negative relationship between current account balances and terms of trade effect among Latin American countries. In contrast to the popular argument of classical dependency school, an increase in terms of trade does not necessarily leads to an improvement in trade and current account balances. However, domestic demand oriented growth is also dependent on relatively cheap import prices. Asian countries still maintain characteristics of a classical dependency, as terms of trade and export shares move together in the shorter terms. However, over longer time periods it is hard to see this pattern in the Asian countries. The most important feature about Asian countries is that export shares always exceed import shares, independently of terms of trade movement. This can be understood in the presence of state action employed to constrain domestic consumption through credit constraints and domestic savings mobilization.

2.6.3 World Trade Effect

$$\left(\left(\frac{P_{t-1}^{x}}{P_{t-1}^{y}}\right).x_{t-1}.\Delta\left(\frac{W_t}{Z_t}\right)\right) \tag{2.13}$$

The world trade effect reflects the effect of an increase in world demand for domestic country's export goods. It is calculated as the ratio of real volume of world trade to domestic country's real GDP level. Equation (2.13) holds the export share of domestic country in real volume of world trade constant. An increase in world demand has a positive effect on current account balances. However, this positive effect can be eliminated by the declining share of domestic country's export to real world trade, x_t. Another problem with this definition of the world trade effect is the normalization of world total real export level with real GDP. An increase in real GDP level depresses the normalized world total trade. This becomes important in identifying total world trade effect in the periods of depression. A decrease in real GDP level may be reflected in a

high world trade effect. In this case, it becomes problematic to analyze the world trade effect. In order to investigate the world trade effect in absolute terms the method will be modified through decomposition that normalizes world real export levels as follow;

$$\left(\frac{P_{t-1}^{x}}{P_{t-1}^{y}}\right).x_{t-1}.\left(\frac{Z_{t-1}.\Delta W_t - W_{t-1}.\Delta Z_t}{Z_t.Z_{t-1}}\right)$$

$$= \left(\frac{P_{t-1}^{x}}{P_{t-1}^{y}}\right).x_{t-1}\frac{\Delta W_t}{Z_t} - \left(\frac{P_{t-1}^{x}}{P_{t-1}^{y}}\right).x_{t-1}.\frac{W_{t-1}}{Z_{t-1}}\frac{\Delta Z_t}{Z_t} \qquad (2.14)$$

The second term in equation (2.11) $\left(\left(\frac{P_{t-1}^{x}}{P_{t-1}^{y}}\right).x_{t-1}.\frac{W_{t-1}}{Z_{t-1}}\frac{\Delta Z_t}{Z_t}\right)$ captures the effect of an increase in real GDP level that negatively effects the world trade effect in equation (2.13). First term of equation (2.14) $\left(\left(\frac{P_{t-1}^{x}}{P_{t-1}^{y}}\right).x_{t-1}\frac{\Delta W_t}{Z_t}\right)$ captures the effect of the absolute change in world trade demand that is illustrated at Figures 2.13 and 2.14 for Latin American and Asian countries, respectively.

According to Figure 2.13, world trade effect does not represent an important share in the change of current account balances in the case of Argentina and Colombia. In Mexico and Brazil, this effect does not seem correlated with the change in current account balances. This shows the importance of the import dependence. Even in the periods of increasing world trade, Latin American countries are not able to increase their current account balances, due to higher persistent import shares.

Figure 2.14 presents the same variables for the Asian countries. In the case of China, changes in the current account balances are associated with the world trade effect. This is the direct result of higher shares of Chinese exports in total world export rates. The share increased from 0.27 percent to 10.14 percent in 24 years. This shows that a change in the current account balances

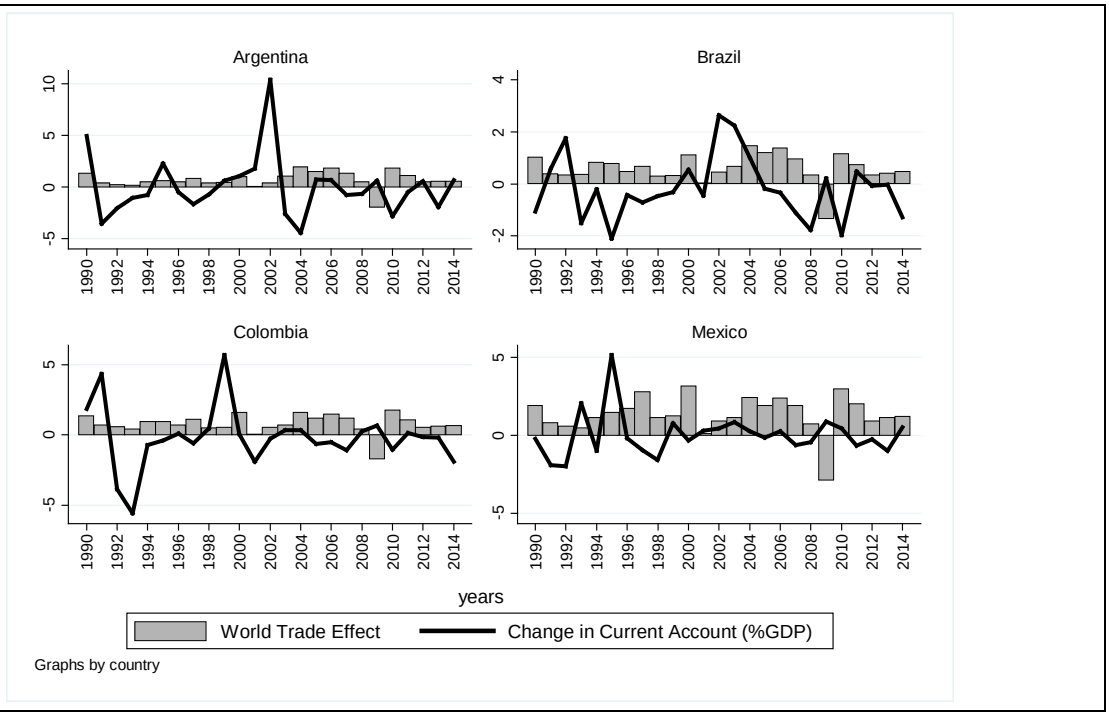

Figure 2.13: World Trade Effect and Change in Current Account Balances, Latin American Countries

Source: UN, World Development Indicator

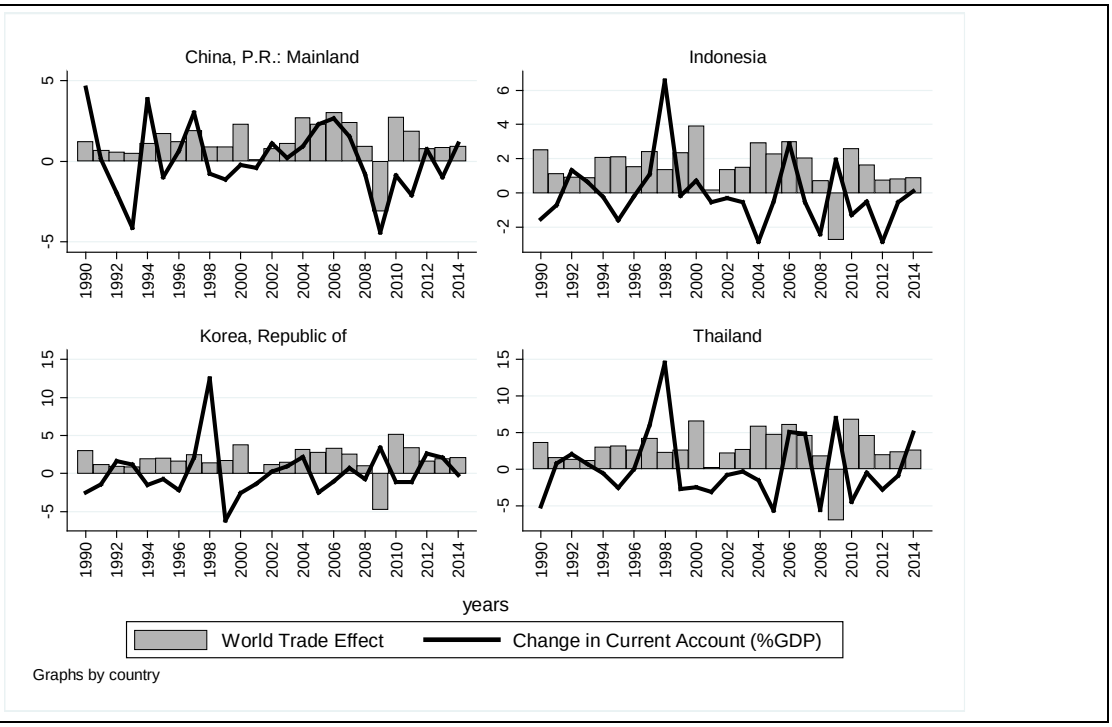

Figure 2.14: World Trade Effect and Change in Current Account Balances, Latin American Countries

Source: UN, World Development Indicator

are linked with world trade and points to limits of the Chinese development model. In the Indonesian case, the world trade effect has an important contribution to changes in current account balances. However, it is hard to conclude that contribution is positive during all periods. An increase in the current account balances are associated with positive world trade effects after 2003. In 2009, a negative world trade effect is associated with an increase in current account balances.

In Korea and Thailand, positive contributions of world trade effect are associated with increases and decreases in the current account balances. Thus, shocks from world trade have an impact on current account balances. The concept of a world trade effect is linked to the country's ability to increase the share of exports. As a result, countries with higher export share in world total export experience higher association between current account balances and world trade effect as it is in the case of China. Figures 2.15 and 2.16 illustrates Latin American and Asian countries' export shares in world total exports.

As it is illustrated at Figure 2.15, Latin American countries do not have stable export or continuously increasing export shares. In the case of Colombia even low shares of exports tend to decline in time, and this explains the reason for a small world trade effect for this country. Argentina kept its export shares relatively constant. However, it starts to decline after 2012 and experiences the lowest level at 2014. Brazil and Mexico were successful in increasing their shares after 2000 and 1994, respectively. Integration of Mexico through NAFTA membership was responsible the increase in its export share. Commodity boom after 2002 was responsible in the same type of increase. However, show no a stable pattern is displayed. This shows the constraint Latin American countries face in sustaining increasing export shares.

The same variable is presented for Asian countries at Figure 2.16. Except for Indonesia, all Asian countries have substantially increased their export shares in world total exports. While the

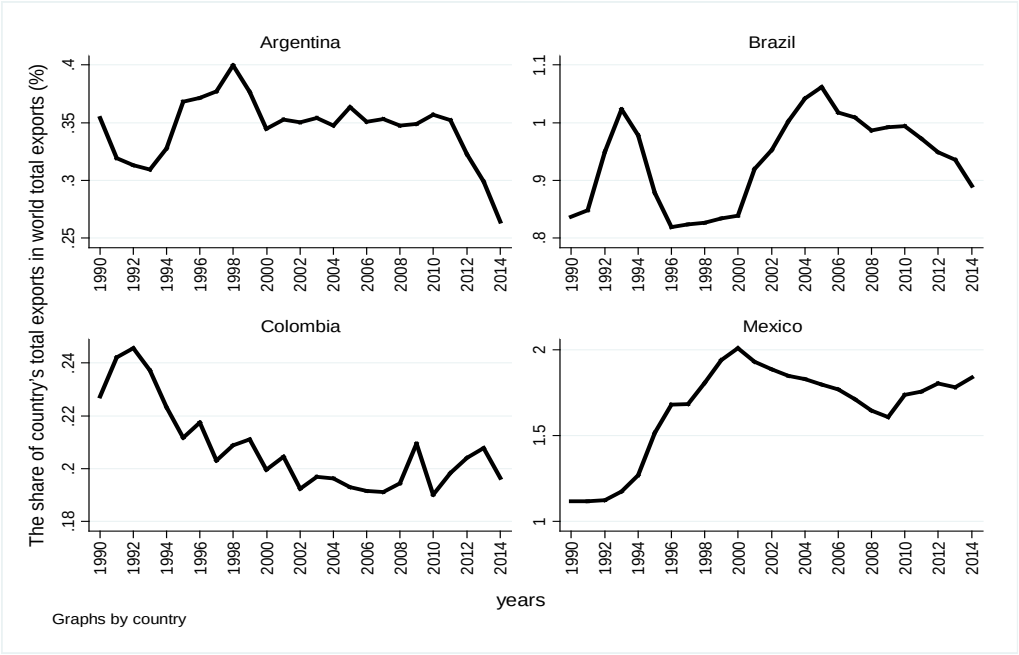

Figure 2.15: The Share of Latin American Countries' Exports in World Trade Exports (%)
Source: UN, World Development Indicators

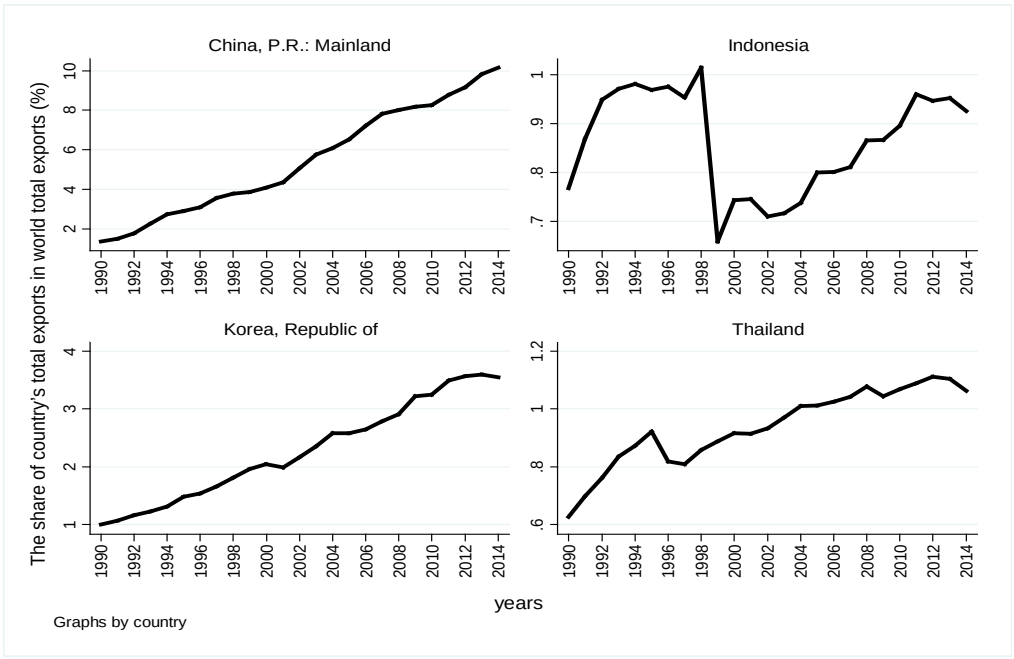

Figure 2.16: The Share of Asian Countries' Exports in World Trade Exports (%)
Source: UN, World Development Indicators

increase is dramatic in the case of China, it is moderate in Korea and slower in Thailand. Indonesia also increased their share after a big reduction during the post-Asian crisis period. The world trade effect must be considered along with the countries' ability to increase their share of exports in world's exports. As in the case of China, countries with an increasing share in world total exports become more and more dependent on world demand and demand shocks from abroad may explain current account fluctuations better. Thus, given the increasing shares of other Asian countries in total world exports, these countries are more vulnerable to shocks from foreign demand. The impact is dramatic in the case of China, it is moderate in Korea and slower in Thailand. Indonesia also increased its share after a big reduction during the post-Asian crisis period.

In conclusion, Latin American countries are paradoxically not as vulnerable as Asian countries due to their lower and non-increasing shares of exports in total world export. China is particularly vulnerable to world demand shock as it happened in 2008 global economic crisis. However other Asian countries potentially share the same problem due to their increasing export shares.

2.6.4 Interest Rate Effect

$$-\left(\frac{F_{t-2}}{Y_{t-1}}.\Delta(r_t)\right) \tag{2.14}$$

The interest rate shock captures the effect of an increase in the interest rate on external debt. Interest rate effect is the last current account related external shock and can be considered in the financial sphere of the economy. Since the share of interest payments abroad is quite low in total current account balance, the negative effect of interest rates may not have influence on determination of current account balances. Interest rate is calculated on the base of total interest payments abroad. In order to find an approximation for the indicator for F_{t-1}, total interest payments are divided by average interest rates on external debt. As in the case of world trade effect,

the effect of interest rates is constrained by the relative foreign debt of the country. A country with high or increasing foreign debt is prone to greater negative effects of interest rate changes on the current account balances. As interest rates increase, total interest payments also increase and hence that results in a decrease in current account balances. Increasing interest rates also leads to an increase in foreign debt to GDP ratio. As interest rates exceed the rate of growth of output, foreign debts become unsustainable and results in balance of payments problems.

Figures 2.17 and 2.18 illustrates interest rate effect and change in current account balances. Since shares of interest payments is quite low in current account balances, the effect is not hugely influential in determining the current account balances.

Interest rates in governing capital flows, as they are one of the main indicators of the return of foreign finance in domestic investments. Higher interest rates attract capital flows to invest while lower interest rates discourage. Capital inflows that are highly responsive to interest rates usually have a speculative character and finance domestic consumption or speculative investments

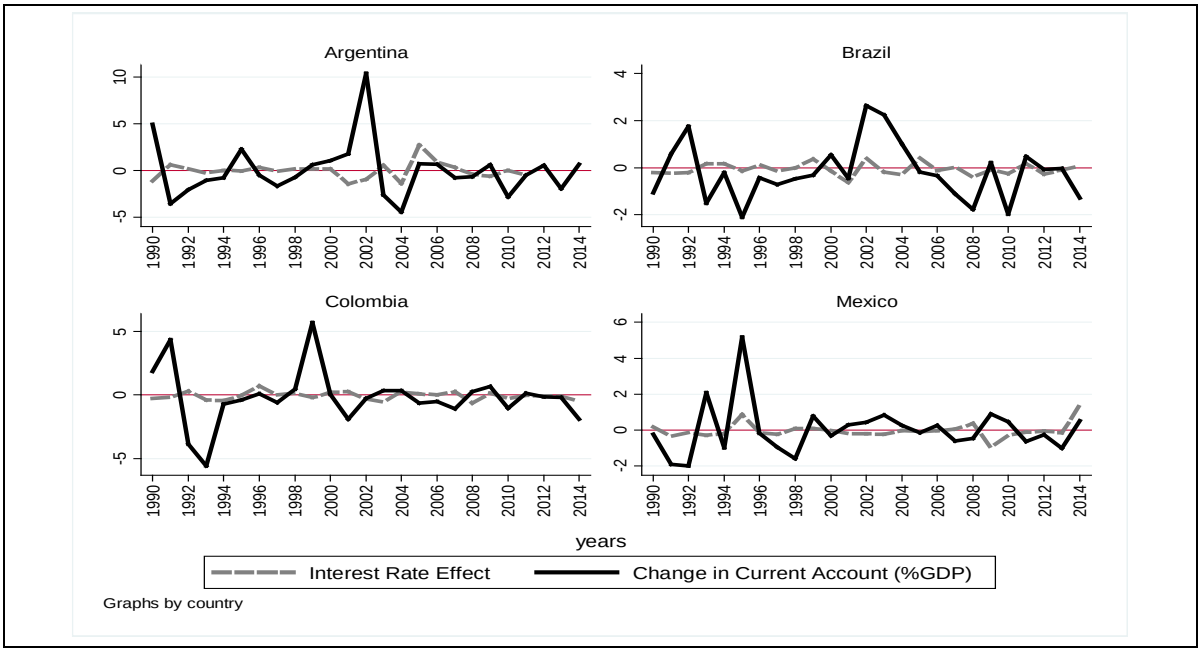

Figure 2.17: Interest Rate Effect (%) and Change in Current Account (%GDP), Latin American Countries.

Source: UN, World Development Index; IMF, Balance of Payments statistics

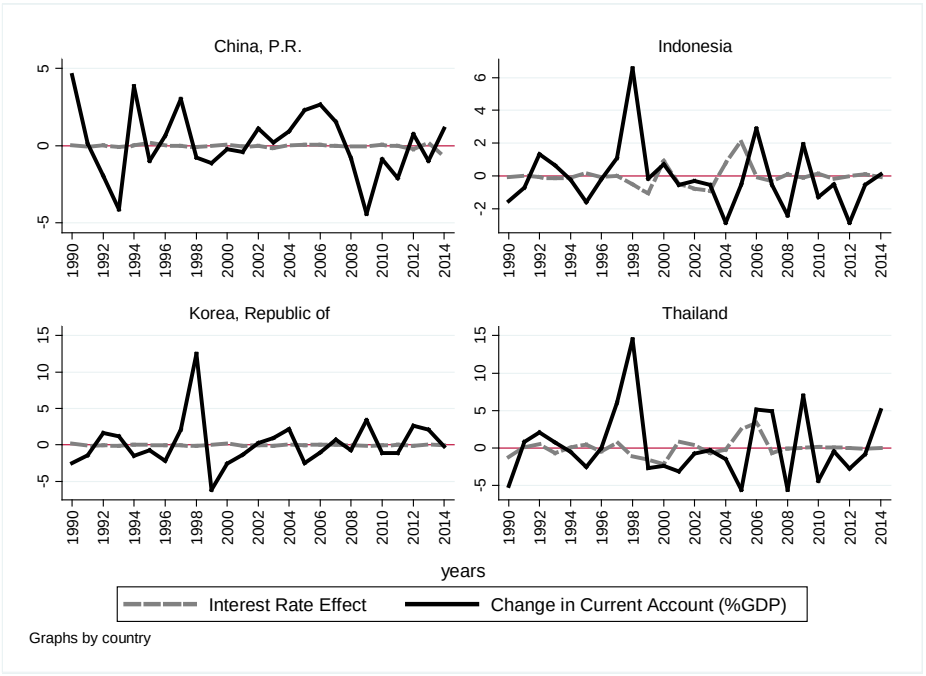

Figure 2.18: Interest Rate Effect (%) and Change in Current Account (%GDP), Asian Countries

Source: UN, World Development Index; IMF, Balance of Payments statistics

due to their higher expected returns. This has an adverse effect on current account balance as it encourages domestic demand for import or import dependent growth. Lower interest rates discourage the foreign investments that has speculative incentives and they may encourage foreign investments that can build productivity in exporting sector.

Lower interest rate effects do not necessarily mean that a financial shock is not an important contributor in current account determination. Capital flows are also significant determinants of current account balances. In order to evaluate financial shocks, capital flows must be considered.

2.6.5 Structure of Capital Flows and Current Account

Interest rate shocks are not sufficient to make an assessment about financial dependence, since interest payments constitute a quite low share in current account balances. Interest rate is not the only channel through which capital flows effect current account balances. Capital flows may

affect global liquidity that seeks higher profits across periphery countries. Higher interest rates increase demand for domestic currency directly which in turn results with real exchange rate appreciation. Real exchange rate appreciation decreases export competitiveness and cheapens imports that leads to current account deficits. The increase in capital inflows also increases import demand due to investment requirements of the projects financed and a demonstration effect, that increases domestic demand for foreign goods (Lal, Deepak, 1985; Calvo, Leiderman, & Reinhart, 1993; Bakardzhieva, Naceur and Kamar, 2010; Cardarelli, Elekdag, & Kose, 2009).

Calvo et.al (1996) emphasized the role of external factors in capital inflows to periphery countries through the channel of interest rate differentials and real exchange rate appreciation. The authors employ a structural VAR analysis to show that most of the variations in real exchange rate appreciation, interest rate differentials, reserve accumulation and capital inflows are explained through variations by the (aforementioned) external factors.

Cardarelli et. al. (2009) analyzes 109 episodes of large net capital flows in 52 countries during the period between 1987 and 2007 and concludes that the surge in capital flows are associated with real exchange rate appreciation and deteriorating trade balances. Bakardzhieva et. al (2010) decompose components of capital flows into FDI, portfolio, foreign aid and debts. They employ GMM estimation procedure to estimate the relationship between real exchange rate appreciation and different types of capital flows along with other control variables which may be effective on the determination of real exchange rate appreciation. They find that portfolio investments, foreign debt and aid have a positive effect in real exchange rate appreciation while FDI flows are not found effective.

Table 2.2 illustrates 5-years average of portfolio investments inflows as a percentage of GDP, foreign direct investment inflows as a percentage of GDP, trade balances as a percentage of

GDP and real effective exchange rate appreciation. Asian countries in average experienced depreciation in real effective exchange rate between 1990 and 2004 associated with increasing portfolio investment liabilities as a share of GDP and a small decrease experienced in foreign direct investment as a share of GDP. In the same period, trade balances on goods and services increased substantially from -0.93 percent to 7.25 percent of GDP. In following two periods, real exchange rate appreciation is associated with increasing both FDI and portfolio investments inflow and deteriorating trade balances. This influence of real exchange rate on trade balances is not apparent among Asian countries due to different trend during the period between 1990 and 2014.

Latin American countries have a more direct relationship between real exchange rate

Table 2.2: Five year averages of real effective exchange rate, foreign direct and portfolio investments inflows as percentage of GDP and trade balances on goods and services as percentage of GDP[11]
Source: IMF, The Balance of Payments Statistics and Darvas, Z. (2012)

Asia	Real Effective Exchange Rate[12]	Foreign Direct Investment Inflows (% GDP)	Portfolio Investment Inflows (%GDP)	Trade Balance on Goods & Services (%GDP)
1990-1994[13]	103.296	2.7627812	0.4918496	-0.9328068
1995-1999	97.128	2.8860708	0.7104304	4.1560632
2000-2004	90.152	2.01015	0.8267852	7.2493248
2005-2009	96.108	2.694656	1.36842	7.5652452
2010-2014	104.715	2.790625	2.716128	4.7674595
Latin America				
1990-1994	99.52444444	1.404424	1.275610222	-0.947123111
1995-1999	113.94	3.326987333	0.630845333	-1.962474222
2000-2004	99.43111111	3.078824	0.642298222	-0.636522667
2005-2009	99.54444444	4.508499556	1.071666222	-0.771059333
2010-2014	113.2666667	4.640395278	2.148214444	-2.030893889

[11] Author's calculations on the base of several sources which are defined in detail in empirical chapter. Latin American countries consist of Argentina, Brazil, Chile, Colombia, Costa Rica, Guatemala, Mexico, Panama, Uruguay, while Asian countries consist of China, Indonesia, Malaysia, Korea and Thailand. Trade openness index of the region is calculated through percentage share of sum of total exports and total imports of each country in sum of GDP levels of each country in the region.
[12] In Darvas (2012) database, an increase in real exchange rate means an appreciation.
[13] Periodization is structured through 5 year averages.

appreciation, capital flows and trade balances. Surges in portfolio investments results with higher level of real exchange rate appreciation and consequently lower level of trade balances as percentage of GDP. In the first two periods, between 1990-1999, surge in FDI inflows associated with an increase in real exchange rate, appreciation and an increase in trade deficits. Interestingly, portfolio investment inflows are decreasing in the same period, which indicates that not only portfolio investments but also FDI inflows also lead real exchange rate appreciation. Similar tendency is also valid after 2005 period. After 2005, FDI inflows and portfolio investment inflows both increasing. During the period portfolio investments doubles from 1.071 percent to 2.148 percent of GDP, while increase in FDI inflows was 0.14 percent of GDP. The increase in these flows leads real exchange rate appreciation from 99.54 to 113.26 and results in higher trade deficits. This shows that Latin American countries experiences real-exchange rate appreciation and trade deficits as the result of an increase in foreign investment regardless of the type of foreign investment.

The shocks of capital flows on trade balances can be presented through Granger Causality tests in a similar way to Ocampo and Palma (2008). Granger Causality tests the time sequence of joint dynamics of two variables and informs about which variable precedes the other one. Table 2.3 presents the results for the changes in net private inflows and trade balances during the period between 1984-2014. Among Latin American countries changes in net private inflows precede changes in trade balances except Mexico. In the case of Mexico, variables do not precede each other and are found independent. Mexico's membership to NAFTA is effective in this result. After NAFTA membership, Mexico increased the export shares in GDP and their export dynamism increased through foreign investments and lower wages in these sectors. Increase in foreign investments to exporting sectors did not exclude the speculative investments on the other side.

Independent relationship between inflows and trade balances can be the result of the mixed structure of capital flows.

On the other side, Asian countries, except Indonesia, have a bidirectional relationship between trade balances and private inflows. These results can be interpreted in a way that foreign investments improve export dynamism and diversifies the export structure and in turn this structure may attract more and more similar types of investments to the economy. Indonesia differently from the countries in the list started to impose capital controls since 2009 which is relatively recent. Additionally, in the first half of the 1990s-enormous amount of capital inflows, that are mostly short-term, led to price bubbles in real estate sector and ever increasing credit expansion that ended up with Asian crisis (Goeltom, 2008). Differently from Indonesia, Thailand started to impose capital controls much earlier than Indonesia. The similar relationship between Indonesia and Latin American countries is the result of relatively late implication of capital controls. FDI flows are considered to be less responsive to real exchange appreciation, however. FDI flows may also lead

Table 2.3: Granger Causality Test results between Net Private Capital Inflows and Trade Balances. (data.imf.org)
Source: IMF, The Balance of Payments Statistics

Latin American Countries	**p-value for "Trade balances inflows do not predict the net private capital inflows"**	**p-value for "Net private capital inflows do not predict the trade balances"**	**Lags[14]**
Argentina	0.987	0.039	1
Brazil	0.329	0	3
Colombia	0.21	0	4
Mexico	0.747	0.187	3
Asian Countries			
China	0	0	4
Indonesia	0.362	0	3
Korea	0.036	0	2
Thailand	0	0.001	4

[14] Lags are chosen based on Akaike Information Criteria.

current account deficits. FDI flows can be either domestic market oriented and or export market oriented. FDI flows aim at penetrating profitable investments in non-trading sectors or in sectors which requires imports and produce for domestic market., may increase current account deficits (Lal, 1985). In contrast to domestic market oriented FDI flows, export oriented FDI flows invest in exporting sectors of the domestic economy and transforms the export structure from traditional to a highly competitive structure that adopts itself to changes in the demand structure of center countries (Palma, 2009).

Domestic and export oriented FDI flows can illustrated through Table 2.4. The table illustrates foreign direct investment flows by sector and trade balances for respective sector in 2010. In the case of Latin American countries, sectors which pull highest foreign direct investment are associated with trade deficits, except for Colombia. Petroleum export has the highest share among Colombia's exports, 13 billion US dollars out of 44.2 billion US dollars, and foreign direct investment flows to petroleum amounts to 2.8 billion out of 6.7 billion US dollars. Except the extreme case of Colombia, foreign direct investments to Latin America does not have any potential for future trade surpluses and net export revenues. In contrast to Latin American case, the sector that attracts highest capital inflows experience trade surpluses among Asian countries, except Indonesia. This shows that foreign direct investments positively affect trade balances if they target export sectors, but the effect is negative if foreign direct investment penetrates domestic markets.

In the preceding section, external shocks are identified and evaluated with respect to changes in current account balances. Terms of trade effects move together with changes in current account balances among Asian countries, however former effects move oppositely with current account balances among Latin American countries. The opposite movement among Latin American countries is the result of import dependence of domestic demand. As terms of trade

improves, the demand for cheap imports increases more than Latin American exports. The world trade effect, except for China, does not move together with current account balances among all countries. However, higher and increasing export shares of Asian countries in world total exports indicate that these countries would also experience world trade effect, somewhat similarly to China. These two external shocks to current account balance reflects two different types of

Table 2.4: Sectoral Compositions of FDI Inflows and Trade Balances of Latin American and Asian Countries in 2010. (millions of US dollar)
Source: http://www.intracen.org

Latin America				
Argentina	Inflow 2010	Exports 2010	Imports 2010	Trade Balance 2010
Primary	1242.7	21554.1	5243.2	16310.9
Secondary	5316	60583.1	67609.3	-7026.2
Tertiary	4896.2	15609.9	17856.9	-2247
Brazil				
Primary	18358.4	72668.1	22355.3	50312
Secondary	20415.8	124312	158063	-33750
Tertiary	12040.6	31598.9	62434	-30835
Chile				
Primary	908.4	21689.6	8004.5	13685.1
Secondary	134.4	49415.7	51234.6	-1818.9
Tertiary	1638.8	11148.7	13028.6	-1879.9
Colombia				
Primary	4610.1	23208.9	2253.7	20955.2
Secondary	691.7	16541.5	38088.6	-21547
Tertiary	1451.6	4376.5	8069.5	-3693
Guatemala				
Primary	120	2908.9	618.9	2290
Secondary	299.4	5545	13176.9	-7631.9
Tertiary	363.3	2267.4	2299.2	-31.8
Mexico				
Primary	1300.5	46471.6	13407.9	33063.7
Secondary	12168.8	250125.6	282254	-32128.4
Tertiary	7903.1	15234.5	25631.3	-10396
Uruguay				
Primary	203.3	2492.9	2093	399.9
Secondary	377	6152.5	9361.1	-3208.6
Tertiary	1653.7	3383.1	2323.6	1059.5

Asia				
China	Inflow 2010	Exports 2010	Imports 2010	Trade Balance 2010
Primary	2863.5	22518.7	326668.2	-304150
Secondary	53860	1552434	1050546	501888.3
Tertiary	49132.7	162165.1	193321.1	-31156
Indonesia				
Primary	2233.8	62042.4	15896.4	46146
Secondary	4971.3	95722.1	118074.5	-22352.4
Tertiary	6361.1	16765.8	26089.3	-9323.5
Korea				
Primary		1332.6	123047.1	-121715
Secondary	6657.2	464756.4	301724.2	163032.2
Tertiary	6302.3	87282.4	95908.4	-8626
Malaysia				
Primary	950.3	26586.8	15180.4	11406.4
Secondary	5135.8	171320.3	148424	22896.3
Tertiary	2972.7	31800.5	32320	-519.5
Thailand				
Primary	805.4	11643	31715.5	-20072.5
Secondary	5075.8	183475.1	150358.3	33116.8
Tertiary	2855.2	34326.4	45029.4	-10703

dependency. First is classical dependency, in which countries' export potentials and unbalanced productive structure are bound with their limited ability to export. Exports revenues are in turn bounded to terms of trade. The second kind of dependency is where countries are able to alter their production structure through export promotion but are constrained by world demand for export.

Asian countries are able to channel capital inflows to exporting activities and sectors through capital controls, Latin American countries does not have the same policy space due to the financial nature of their dependency. The main reason for Latin American countries' inability to impose capital controls is the shortfall in domestic savings relative domestic investments. Domestic saving rates are structurally low at Latin American countries and high at Asian countries. The discrepancy reflects the importance of public policies to increase structural saving rates, in consonance with industrial policies which increase the export competitiveness. The export-led growth was successful in mobilizing savings. But growth become more and more dependent on world demand for their export goods, in Asian countries. Interruptions from consumption demand of center countries, left Asian countries with negative growth rates and stagnation.

2.7 Conclusion

In this work, several types of dependent relationships are investigated on the base of Asian and Latin American countries. These differences in their dependent relationship structured their paths toward globalization. Latin American countries' nature of dependency is found financial due to lack of higher domestic savings and private financial surpluses, while Asian countries are dependent to world demand for export goods. On the condition of these different natures of dependent relationships, Latin American countries and Asian countries followed divergent paths toward globalization. Latin American countries followed financial and trade liberalization side by side due to their dependent relationship with capital flows. Higher saving investment shortfall

among Latin American countries attracted capital flows that directly compel with existing domestic firms or was aimed at the domestic market. These type of capital flows do not have any impact on strengthening export sectors. These capital flows indeed deepen the problem of current account deficits through resultant real exchange rate appreciation and reproduce financial dependency among these countries.

Asian countries are also dependent on world markets to expand export revenues and on capital flows to build technological capacity and competitive exports. However, these countries could channel capital flows towards exporting sectors and building a competitive export structure. Capital control management techniques strengthen Asian countries against domestic market oriented capital flows and allow these countries to be more selective in capital flows. In this way, Asian countries improved their current account balances, rendered export sectors competitive in terms of value added and altered their unbalanced productive structure under dependent relationship with center countries.

One of the most principal factors which determine the degree of financial dependency of a periphery country is the structural domestic saving rate. In this work, other factors such as the importance of the developmental state, regional aspect of foreign investments and divergent political relations with center countries are not directly addressed while focusing on the importance of saving policies. However, other factors that determine the nature of dependent relation of a periphery country are not less important. Domestic saving mobilization is the result of developmental state which employed financial restraints on the one side and dynamic industrial policies on the other. According to Evans (1995), embedded autonomy is the key for a developmental state with a harmonious relation between state, civil society and firms. Regional aspect of foreign investment is also a key factor in export promotion. Flying geese pattern of

technology and capital flows among Asian countries is an important factor in altering unbalanced productive structure.

Latin American countries did not have enough domestic savings to finance domestic investments. Further, the liberalization of financial accounts was not accompanied by any appropriate saving policies. Industrial policies in Latin America were domestic market oriented and this led to further deterioration of the structural saving rates in these countries. Asian countries adopted saving policies compatible with industrial policies to decrease their dependence on foreign capital, while channeling capital to export sector. As a result, Asian countries reduced their financial dependency, but due to their export promoting strategies, increasing export shares in world total exports made these countries dependent on demand from center countries. The export oriented path of development tied their economies to pattern of world trade.

CHAPTER III

EMPIRICAL ANALYSIS OF TRADE BALANCES AND CAPITAL FLOWS

3.1 Introduction

In the Chapter I, a Post-Keynesian open economy model is presented for Latin American and Asian countries. The model based on the assumption that while foreign capital leads to real exchange rate appreciation in Latin American countries, it increases the productivity of labor in Asian countries. In the case of Latin American countries, an increase in foreign capital stock leads to nominal exchange rate appreciation and results in real exchange rate appreciation under free exchange rate regime. This appreciation cheapens import goods that are both consumed by workers and used as an intermediate good in production. Workers will be willing to target lower nominal wages and a decrease in production costs due to both cheaper foreign intermediate goods and lower wages. This increases capacity utilization, but also expands trade deficits due to appreciate real exchanges. As a result, foreign capital flows lead to deteriorating trade deficits through worsening price competitiveness of export goods. The effect of foreign capital flows is different in Asian countries. Asian countries employ capital controls and are more selective in foreign capital. These countries can channel foreign capital to more productive export sectors as the outcome of different dependent relationship that was investigated in Chapter II. It is assumed that foreign capital increases the productivity of labor in these countries which decreases the nominal wages. As wages decrease, price declines and that results in a real exchange rate depreciation. It is assumed that the increase in production costs due to more expensive intermediate foreign goods was less than the decrease in nominal wages, resulting in both higher capacity utilization and trade surpluses.

In this chapter, it is intended to test the relationship between capital flows, real exchange and trade balances on Asian and Latin American countries. Due to divergence in development and globalization patterns, the relationship between trade balances and capital flows may also differ among these sets of countries. Asian countries may perform better in trade balances than Latin American countries in the presence of capital flows since 1990s. First and foremost, in this success is the asymmetric patterns of trade and financial liberalizations. Asian countries integrated more with world trade, but imposed some restrictions on capital flows. Restrictions on capital flows would discourage speculative investments due to higher costs of investment and capital flows can be channeled to export sectors. In this case, capital flows may contribute for surpluses in trade. In the case of Latin American countries, with lower integration to world trade and internationally open financial markets, capital flows may affect trade balances negatively due "market seeking investments" that serves for domestic market and does not carry any potential for future trade surpluses or export revenues.

The different effects of capital flows on trade balances is tested, based on corresponding divergent development paths of Asian and Latin American countries. The effect of capital flows on trade balances is tested through Panel Vector of Autoregression (PVAR) analysis, is explained in the following section. Estimation results of PVAR are assessed through impulse response functions and forecast error variance decomposition. Correlation between idiosyncratic errors of each equation in VAR model may bring different outcomes for different orderings of the variables in the system. To detect proper ordering of orthogonalized shocks, Directed Acyclic Graphs (DAGs) are derived and proper ordering of orthogonalized shocks is specified.

This chapter includes two sections. The second section presents an overview of the PVAR model approach, model selection, ordering selection through DAGs analysis and finally the

assessment tools, impulse response functions and forecast error variance decomposition. The third section covers estimation procedure, data information, estimation results of PVAR model and finally the forecast error variance decomposition results and impulse response functions.

3.2 Empirical Method

This section briefly presents the theoretical basis of PVAR analysis, estimation method-procedure and tools employed to assess driving forces of the PVAR system, namely forecast error variance decomposition and impulse response functions. Finally, the DAGs analysis is introduced in order to detect proper ordering of variables.

3.2.1 Panel Variance Autoregression Analysis

The interdependent nature of economic variables renders structural form models a problematic estimation procedure. Structural form models assume a dependent variable and a set of independent variables which determine the dependent variable. This kind of specification differentiates the dependent variable as an endogenous variable and the independent variables as exogenous variables. This specification is based on economic theory and the model is identified through the assumptions imposed by economic theory.

Sims (1980) claims that every assumption which is imposed by economic theory, results in more unrealistic empirical results. In that case, Sims draws attention to another estimation process which presupposes that all variables in the system are endogenous and dependent to each other. Additionally, Sims also suggests the model does not have to be based on a strict economic theory. This estimation method is named as vector autoregression (VAR) analysis, can be defined concisely as an m-equation, m-variable linear model. Each variable is regressed by its own past values and past values of remaining variables. Holtz-Eakin, Newey and Rosen (1988) have expanded the scope of VAR analysis with panel data.

VAR models allow researchers to deal with the endogeneity problem effectively. As mentioned earlier, structural econometric models do not supply information about the causal relationship between interdependent variables. In addition to estimating the effects of dependent variables on each other, it is also intended to show causal relationships between them. Causal relationship refers for the predictive power of one variable over another variable and has important aspects in time series analysis in the presence of high endogeneity among dependent variables.

PVAR model supports our empirical analysis through two contributions. Firstly, a panel analysis enables researchers to apply test procedure to a high number of observations from many panel variables or countries in this work. Secondly, interdependent relationships between real effective exchange rate, trade balances and capital flows which are being estimated have a high potential for endogeneity and missing variable problem. PVAR analysis gives a chance for eliminating endogeneity problem and closes estimation process to extrinsic factors.

An m variable, kth order VAR (denoted as VAR (k)) with panel-specific fixed effects can be illustrated as follow;

$$x_{it} = \Pi_1 x_{it-1} + \Pi_2 x_{it-2} + \cdots + \Pi_k x_{it-k} + u_i + e_{it} \qquad (3.1)$$

Where x_{it} is a $mx1$ vector of m endogenous variables and Π_j is an mxm coefficient matrix, u_i refers to $kx1$ vector of specific fixed effects and e_{it} stands for $kx1$ vector of idiosyncratic errors. The subscript i represents the type of country. After this brief introduction to m variate VAR (k) model, more detailed estimation procedures are introduced in the following sections. VAR analysis requires a proper estimation method, transformation of data to eliminate fixed effects, and selection of the model (lag length). In addition to estimation procedure, a VAR analysis requires assessment tools in order to interpret the results of VAR model (impulse response

functions and forecast variance decomposition). Following sections deal with these preceding topics and issues.

3.2.2 Generalized Methods of Moments (GMM) Estimation

The panel VAR model established in the preceding section is estimated through the GMM procedure. In panel VAR models, potential autocorrelation and heteroscedasticity problems can be eliminated through GMM estimation procedure (Hansen, 1982). Other types of estimation procedures (like ordinary least squares and maximum likelihood estimation) a priori, assume a data generating processes such as a normal distribution. Differently from former estimation methods, GMM estimation procedure does not require information about data generating processes or knowledge of the distribution of data. Estimators found through GMM tends to be more robust than ones derived through other methods or procedures (Greene, 2012).

Among static estimation procedures, independent variables are considered as exogenous and as not having correlation with error terms. However, dynamic models where there is some correlation between error terms and the exogenous variables, the panel estimation outcome becomes biased and is not robust (Hsiao, 2003). In order to sustain the assumption of serially uncorrelated errors and to eliminate panel fixed effects, Anderson and Hsiao (1982) propose the first difference transformation. First difference transformation causes many problems at panel analysis. Missing data is the first problem about first difference transformation. Second, the lag order of the panel VAR also affects the number of necessary observations (Abrigo & Love, 2016). The third problem is the loss of significance in level relationship between dependent variables through first difference transformation.

Arellano and Bover (1995) proposes an alternative transformation method, forward orthogonal deviation, to addresses the problems which arise through first difference

transformation. Differently from first difference transformation, this method uses the information of future observations. It is simply the difference of future observations' mean from current observation. The forward orthogonal deviation is derived as follow;

$$x_{it}^{*} = \sqrt{\frac{T-t}{T-t+1}}\left[x_{it} - \frac{1}{T-t}(x_{it+1} + \cdots + x_{it})\right] \; t = 1, \ldots, T-1 \tag{3.2}$$

where x_{it} refers to a single variable. Following from this transformation, panel VAR model (3.1) turns into the form;

$$x_{it}^{*} = \Pi_1 x_{it-1}^{*} + \Pi_2 x_{it-2}^{*} + \cdots + \Pi_k x_{t-k}^{*} + e_{it}^{*} \tag{3.3}$$

In a shorter way, equation (3.3) can be transformed into the following;

$$x_{it}^{*} = \Pi X_{it} + e_{it}^{*}$$

where $\Pi = (\Pi_1, \ldots, \Pi_k)$ is an $m\ x\ mk$ matrix and $X_{it} = (x_{it-1}^{*}, \ldots, x_{it-k}^{*})$ is a $mk\ x\ 1$ vector. After implying forward orthogonal deviation to every single variable, GMM method has to be employed to each equation in the VAR models. In the STATA patch used in this work[15], instruments which are proposed by Holtz-Eakin, Newey and Rosen (1988) are employed. The instruments are identified as the lags of dependent variables in the VAR system. Since the panel data employed in this paper is strongly balanced and does not include missing values, there is no need to pay special attention to problems which may arise due to these issues. The vector of instrumental variables is $Z_{it} = (x_{it-2}, \ldots, x_{i1})$ which is a $mk \times (t-2)$ matrix. GMM estimator of coefficient matrix $\Pi_{(m \times mk)}$ is found as follows;

$$\Pi = (X'ZWZ'X)^{-1}(X'ZWZ'x) \tag{3.4}$$

[15] Corresponding patch is developed in Abrigo and Love (2015) paper.

where W is a $(t-2)\times(t-2)$, non-singular, symmetric and positive semi-definite weighting matrix. The estimators are tested through Wald Test on the base of the hypothesis that all coefficients of past values of l^{th} variable are equal to zero jointly.

3.2.3 Model Selection

The previous section introduced GMM estimation procedure in panel VAR systems. The decision criteria for the order of the panel VAR will be introduced in this section.

The order of the panel VAR model and the moment conditions implied in GMM estimation procedure is identified through consistent model and moment selection criteria (MMSC) which is proposed by Andrews and Lu (2001). Andrews and Lu (2001) predicate MMSC on J test static for testing over-identifying restrictions and adopts the Akaike information criteria (AIC), the Bayesian/Schwartz information criteria (BIC/SIC) and the Hanna-Quinn information criteria to dynamic panel data models (HQIC) as follows;

$$MMSC_{BIC,n}(m,k,l) = J_n(m,k,l) - (|l| - |k|)m^2 \ln(n)$$

$$MMSC_{AIC,n}(m,k,l) = Jn(m,k,l) - 2m^2(|l| - |k|)$$

$$MMSC_{HQIC,n}(m,k,l) = J_n(m,k,l) - Q(|l| - |k|)\ln(n)$$

where m is the number of variables, k is the order of panel VAR model, Q is greater than 2 and l is the number of moment conditions which is derived l lags of dependent variables. The preceding criteria are valid when lags of the dependent variables (l) are bigger than order of the panel VAR (k). Andrews and Lu suggest using the model which minimizes one of the preceding criterion.

In the next section the tools which illustrate and help researchers in interpreting the estimation outcomes of panel VAR model are presented. These tools are impulse response functions and variance-decomposition.

3.2.4 Impulse Response Function

Impulse response functions help researchers in the interpretation of estimation results of a VAR system. An impulse response function illustrates and traces the response of an endogenous variable to a change in one of the innovations[16] (Watson & Teelucksingh, 2010, p. 242). A VAR model can be illustrated as a vector moving average. Before this transformation, the VAR system has to sustain stability condition which implies that VAR(k) had to be covariance stationary. A VAR(k) system is stationary when all eigenvalues of the companion matrix are less than one. A companion form of a VAR(k) system sustains the statistical properties of a VAR(k) system through the results derived from a VAR (1) system. Let's consider the VAR(k) system in equation (3.4) as follows;

$$x_{it}^{*} = \Pi_1 x_{it-1}^{*} + \Pi_2 x_{it-2}^{*} + \cdots + \Pi_k x_{it-k}^{*} + e_{it}^{*}$$

The companion form of the preceding equation can be derived as;

$$z_{it} = \Upsilon z_{it-1} + \varepsilon_{it} \tag{3.5}$$

where $z_{it} = \begin{pmatrix} x_{it}^{*} - \mu \\ x_{it-1}^{*} - \mu \\ \vdots \\ x_{it-k}^{*} - \mu \end{pmatrix}$ and $\mu = 0$ since constant terms are excluded from the VAR (k) system in equation (3.5). The companion matrix Υ can be defined as;

$$\Upsilon = \begin{pmatrix} \Pi_1 & \Pi_2 & \dots & \Pi_{k-1} & \Pi_k \\ I_m & 0 & \dots & 0 & 0 \\ 0 & I_m & \dots & 0 & 0 \\ \vdots & \vdots & \ddots & \vdots & 0 \\ 0 & 0 & \dots & I_m & 0 \end{pmatrix} \text{ and } \varepsilon_{it} = \begin{pmatrix} e_{it}^{*} & 0 & \dots & 0 \\ 0 & 0 & \dots & 0 \\ \vdots & \vdots & \vdots & \vdots \\ 0 & 0 & 0 & 0 \end{pmatrix}$$

The companion matrix,Υ informs about stationarity/stability of the system. If all the eigenvalues of Υ are less than one in absolute value, the VAR(k) system can be considered as stable. Since the

[16] An innovation is defined as one standard deviation change in the error term of corresponding equation.

system is stable, VAR(k) system can be transformed into a vector moving average of the form,

$$x_{it}^{*} = e_{it} + \Xi_1 e_{it-1} + \Xi_2 e_{it-2} + \cdots \quad (3.6)$$

where $\Xi_1 = \Pi_1 e_{it}$, $\Xi_2 = \Pi_1^2 + \Pi_2 e_{it}$ and through iteration, higher order can also be found. The response values found in equation (3.6) are the responses calculated through a unit change in the error term. In this type of impulses, the main problem is the assumption that a shock occurs only in one variable at a time. This case makes sense when error terms in the system are assumed independent. However, an exogenous impulse may be the result of a shock which belongs to another error term. This means that error terms may include all the influences which are not included in the system. In order to overcome this problem orthogonalized impulses are developed. In order to transform preceding impulse responses to orthogonalized impulses the covariance matrix of the system can be decomposed through Cholesky decomposition as follow (Lütkepohl, 2005);

$$\Omega = PP' \quad (3.7)$$

Equation (3.7) transforms the response function in equation (3.6) an orthogonalized response function as follows;

$$x_{it}^{*} = PIP^{-1}e_{it} + P\Xi_1 P^{-1} e_{it-1} + P\Xi_2 P^{-1} e_{it-2} + \cdots$$

$$PIP^{-1} = \Phi_0$$

$$P\Xi_l = \Phi_l \; where \; l = 1, \ldots, m$$

$$P^{-1}e_{it-j} = \omega_{it-j} \;\; where \; j = 1, \ldots, k$$

$$x_{it}^{*} = \Phi_0 \omega_{it} + \Phi_1 \omega_{it-1} + \Phi_2 \omega_{it-2} + \cdots \quad (3.8)$$

The covariance matrix of the system which is represented in equation (3.8) now become the identity matrix, $E(\omega_{it}\omega_{it}') = I_n$. Through orthogonal impulses, the outside effects are excluded from the analysis.

3.2.5 Forecast Error Variance Decomposition

Forecast Error Variance Decomposition (FEVD) is an econometric times series tool that is employed by macroeconomists in VAR analyses in order to assess the driving forces in the system. An h-step forecast error can be computed as;

$$X^{*}_{it+h} - E(X^{*}_{it+h}) = \sum_{j=0}^{h-1} \Xi_j e_{it+h-j} \tag{3.9}$$

In the preceding equation (3.9) X^{*}_{it+h} is the observed vector at time $t+h$ and $E(X^{*}_{it+h})$ is h-step ahead expected vector at time t. As in the case of impulse response functions equation (3.9) can be transformed into an *orthogonal* impulse as follow;

$$X^{*}_{it+h} - E(X^{*}_{it+h}) = \sum_{j=0}^{h-1} \Phi_j \omega_{it+h-j} \tag{3.10}$$

Since the mn th element of Φ_j is illustrated as θ_{mnj}, the h step forecast error of the s-th component of X^{*}_{it} is

$$X^{*}_{it+h} - E(X^{*}_{it+h}) = \sum_{j=0}^{h-1} (\theta_{s1j}\omega_{1i,t+h-j} + \cdots + \theta_{smj}\omega_{ki,t+h-j}) \tag{3.11}$$

It is known that ω_{kit}' s are uncorrelated and have unit variances. The forecast error variance can be written as follow (Enders, 1995);

$$E\left(X^{*}_{it+h} - E(X^{*}_{it+h})\right)^2 = \sum_{j=0}^{h-1} (\theta^2_{s1j} + \cdots + \theta^2_{smj}) \tag{3.12}$$

Contribution of innovations in variable m to forecast error variance of the h-step forecast of variable s is as (Lütkepohl, 2005);

$$\sum_{j=0}^{h-1}(\omega_{is}'\Phi\omega_{im}) = \sum_{j=0}^{h-1}\theta_{smj}^{2} \quad (3.13)$$

By dividing equation (3.13) with equation (3.12), forecast error variance decomposition is found. Forecast error variance decomposition informs about the "proportion of the movements in a sequence due to its "own" shocks versus shocks to the other variable". (Enders, 1995) If a shock from an alternative series' error term is not able to explain the forecast variance of the series under question, series under question can be considered as exogenous from the alternative series.

Forecast error variance decomposition and orthogonalized impulse response functions used to be popular tools for policy analysis of VAR models. However, orthogonalization of VAR models through Cholesky decomposition provides an isolated structure, it imposes a recursive structure on the contemporary relationships of the variables. (Ronayne, 2011; Demiralp & Hoover, 2003) The choice of the orthogonalizing transformations must be justified empirically. The following section introduces Directed Acyclic Graphs (DAG) analysis and its role in determination of proper ordering of variables in the panel VAR model, in order to specify the order of orthogonalized shocks to the system.

3.2.6 Directed Acyclic Graph (DAG) Analysis

As it is mentioned earlier, the orthogonalization of VAR model results in a recursive structure on the contemporaneous relationships of the variables in the panel VAR model. The choice of proper causal orderings used to be justified through the a priori knowledge of researcher which is mainly economic theory. DAG analysis provides a sufficient statistical basis for proper ordering of recursive VAR model.

Directed Acyclic Graphs (DAGs) are derived on the basis of a concept of causality concept derived by "The Causal Inference School". This school of research "uses a mixture of logic and

statistical correlations to infer (where possible) the directions of causality among a set of variables" (Haughton & Haughton, 2011, p. 94).

A directed graph involves a cluster of "vertices" and a cluster of directed edges that connect pairs of vertices. The graph is acyclic if it does not contain any cycles which means that there is no directed path which starts from one variable and goes back to the same variable. DAGs represent a set of conditional independent relations among the variables in the VAR model, as implied through the recursive product decomposition (Haughton & Haughton, 2011; Haigh & Bessler, 2004)

$$P(V_1, V_2, V_3, \ \ldots, V_n) = \prod_{i=1}^{n} P(V_i | pa(V_i)) \tag{3.14}$$

On the left-hand side of equation (3.14) P refers for the probability distribution function of variables $V_1 \ldots V_n$ and on the right-hand side of the equation $pa(V_i)$ is the set of "parents of" V_i, which is the set of variables with an arrow leading directly to V_i in the graph. *P* denotes the probability of events involving the variables. (Haughton & Haughton, 2011; p. 97-98)

In order to derive DAGs the software package TETRAD V is employed which is available free from program's website[17]. TETRAD involves several different search algorithms that derives the causal connections between variables in the system. In this work, Greedy Equivalence Search (GES) algorithm is employed in searching causal links. In GES algorithm, a two-phase search algorithm are employed. In the first phase, the algorithm starts with unbounded vertices in the graph. The directed edge which provides highest model selection criterion, Bayesian Information Criterion (BIC) score, are included in the graph. In the second phase the algorithm works

[17] http://www.phil.cmu.edu/tetrad/current.html.

backwards and removes edges that improve the BIC score, continuing up to the point where there is no further improvement in the BIC score. Chickering (2002) presents key details about the algorithm.

GES algorithm is implied to innovation vectors that are derived from VAR model and the cause link is identified through the same algorithm. In order to capture DAG of innovations, correlation matrix of innovations is used as an input for GES algorithm. Through partial correlation information that is derived from scaled inverse matrix of innovation correlation matrix, a DAG is determined. After a DAG is specified for innovations of VAR model, the causal structure in the DAG can be used to determine the order of orthogonalized shocks.

The following section explains the model employed based on three variables: percentage change in real effective exchange rate, trade balances and capital flows.

3.3 Estimation Procedure, Data and Results

The test procedure is based on the theoretical dichotomy about capital flows and trade balances. Two set of countries are investigated, Asian and Latin American, which have quite different developmental history in terms of industrial policy and integration patterns to world trade and finance markets. Causal, predictive relationship between these variables and the direction of this relationship is estimated through PVAR method and DAG analysis. Here we present the estimation procedure, data and the results of empirical analysis.

3.3.1 Data

In this work the dynamic relationship between trade balances as percentage of GDP (TBG_t), capital flows both portfolio investments per GDP ($PILG_t$) and foreign direct investment per GDP ($FDILG_t$) and percentage change in the real effective exchange rate appreciation ($PREER_t$). Data consists of two set of countries that are Latin American and Asian

countries. Data covers years between 1984 and 2014 for Latin American countries and between 1986 and 2014 for Asian countries. Panel data set includes 9 panel variables and 252 observations for Latin American countries per variable, while includes 5 panel variables 146 observations for Asian countries per variable. Latin American countries consist of Argentina, Brazil, Colombia, Costa Rika, Guatemala, Panama, Uruguay and Mexico. Asian countries involve Republic of Korea, China, Malaysia, Thailand and Indonesia.

Foreign direct investment liabilities, portfolio investment liabilities and trade balances in goods and services are collected from two sources. These variables' data between 1990 and 2014 are collected from IMF Balance of Payments Database, ENCLA, Bank Indonesia, Bank of Thailand, State Administration of Foreign Exchange (China). The data between 1984 and 1990 are collected from Broner, Didier, Erce, and Schmukler (2013)paper.

Real exchange rate data is gathered from Darvas (2012). Darvas (2012) derives real exchange rate data through the following equation

$$REER_t = \frac{NEER_t * CPI_t}{CPI_t^{foreign}} \tag{3.15}$$

where $REER_t$is the real effective exchange rate of domestic country against a basket of currencies of trading partners, CPI_t is the consumer price index of domestic economy, $NEER_t$ is the nominal exchange rate of domestic country that is geometrically weighted average of the nominal bilateral exchange rate between domestic country and its trading partners and $CPI_t^{foreign}$ is again the geometrically weighted average of the consumer price indexes of trading partners. Finally, nominal GDP in dollars is collected from World Development Indicators database of World Bank.

Table 3.1 shows average values of capital flows and trade balances as percentages of GDP in selected years. The periods are specified with respect to economic expansion and contraction periods of Latin American and Asian Countries. In the period 1976-82, Latin America attracts

higher level of capital flows in the form of syndicated loans after the peak in oil prices in 1976. Meanwhile, Latin American countries also experienced negative trade balances. In period after Latin American debt crisis in 1982, Latin American countries experience positive trade balances as a result of contracting domestic demand and less amount of capital flows are pulled. The following period was an expansionary period except for the banking crises in 1994 in Paraguay, Venezuela and Argentina. Since the effect of banking crises did not spread regionally, Latin American countries' GDP was still lower than Asian countries. This changed after 1996 following the Asian crisis. A striking effect of this crisis was the sharp reduction of imports which led the crisis countries accumulate higher amount of foreign reserves. The booming US economy also hauled out Asian countries by generating an increase in export demand. Under those favorable conditions, Asian countries found increased capital control measures. Indonesia is an outlier in this context, to capital management techniques have been applied here only since 2011. (Wang, 2008; Gochoco-Bautista, Jongwanich, & Lee, 2012).

Table 3.1: Average capital flows and trade balances as percentage of GDP among Asian and Latin American countries in selected periods

Source: IMF, Balance of Payments Statistics, ENCLA, Bank Indonesia, Bank of Thailand, State Administration of Foreign Exchange (China), Broner, Didier, Erce, and Schmukler (2013)

	Trade Balances (%GDP)					
	1976-1982	1983-1989	1990-1996	1997-2002	2003-2008	2009-2014
Asia	-0.01564	0.011124	-0.0129	0.076729	0.072714	0.051301
Latin America	-0.02135	0.022474	-0.00948	-0.01456	-0.00764	-0.01605
	Capital Inflows (%GDP)					
	1976-1982	1983-1989	1990-1996	1997-2002	2003-2008	2009-2014
Asia	0.02353	0.016431	0.035989	0.024839	0.04098	0.052999
Latin America	0.013068	0.006936	0.031577	0.040665	0.053331	0.063281

3.3.2 Estimation Procedure

Latin American and Asian countries experienced divergent patterns of development that are investigated in detail at Chapter II. It was found that Asian countries had competitive export structures, sound macroeconomic indicators and high level of saving and investment rates as the result of successful policy practices of mobilizing savings and investments, industrial policies and restrictions on international capital flows. Trade balances in Asian countries can thus be independent or positively affected by capital flows that tend to be directed to export sectors. However, Latin American countries have a divergent pattern of globalization and industrial policies from Asian countries. The simultaneous push to capital account openness and trade openness made these countries vulnerable to detrimental effects of capital flows, such as unsustainable trade deficits, import and domestic market dependent growth.

The divergent paths towards globalization for Asian and Latin American countries can be seen from Figure 3.1. The Figure illustrates trend components of trade openness and capital account openness indices for each country that is derived through the Hodrick-Prescott filter. As it can be seen from the figure, Asian countries have an increasing trade openness index while decreasing capital account openness index after 1984, however Latin American countries follow an opposite path after 1986.

Divergent paths toward globalization may result in different dynamic relationship between real exchange rate appreciation, trade balances and foreign investments. Countries that have controlled/less open capital/financial accounts may orient capital flows to exporting sectors or be more selective in capital flows that have potential for future export revenues. However, countries that have more open financial/capital accounts cannot be selective in capital inflows and they may flow to sectors that have not potential of future export revenues.

In this work, the link from capital flows to real exchange rate appreciation and to trade balances will be tested separately on the set of Latin American and Asian countries. These two set of countries have structural differences. In order to assess the relationship, FEVD and impulse response functions are employed. While FEVD helps evaluating exogenous nature of trade balances and real exchange rate appreciation, impulse response functions provide the sign and significance of the relationship.

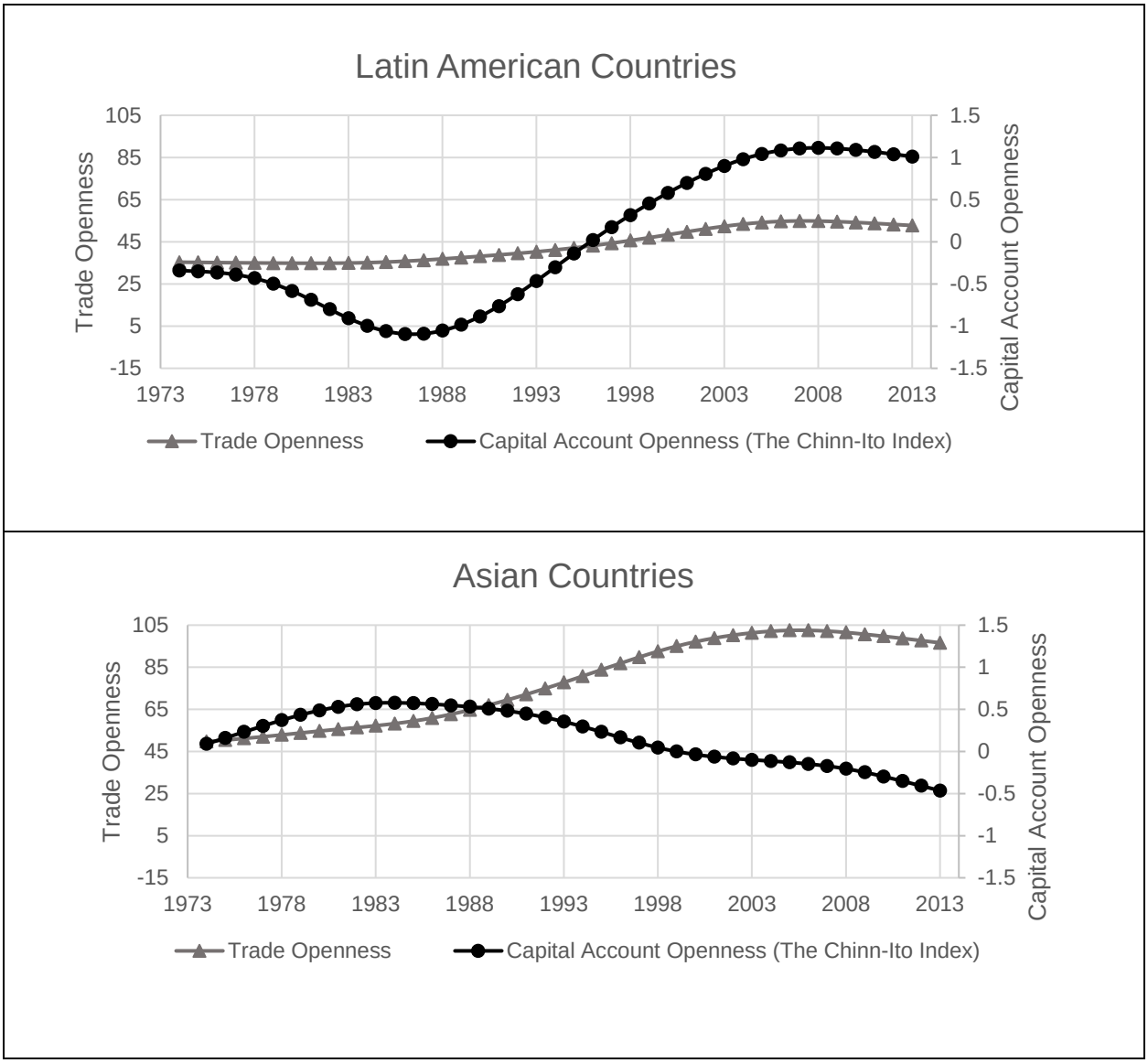

Figure 3.1: Trend Components of Trade and Capital Account Openness indices of Latin American and Asian Countries.

The test is applied to two type of capital flows which are portfolio investments and foreign direct investments. The differences between these flows and their roles in the development process has been in the center of discussion of current account sustainability, export promotion strategies etc. (Roubini & Wachtel, 1998). Goldstein and Razin (2006)illustrate that portfolio investments are more volatile than FDI. The test will be applied to these two-different types of flows in order to show whether different dynamic relationship between trade balances and different type of capital flows can be seen. Two models are analyzed for two different time periods, on the base of the qualitative differences between FDI and portfolio investments and historical differences between Latin American and Asian countries.

Estimation procedure will be in the following order. Firstly, model specification will be done through model selection criteria. Secondly, panel VAR is estimated and thirdly with the innovation correlation matrix retrieved from panel VAR model the proper ordering is specified through DAG analysis in order to choose a statistically significant Cholesky ordering for FEVD and impulse response function analyses.

Lastly the same test procedure is applied for Latin American countries excluding Panama and Mexico and for Asian countries excluding China and Korea for sensitivity check. Panama is chosen due to mass amount of financial inflows relative to small scale of the economy. Mexico also can be considered as another outlier among Latin American countries because of membership of NAFTA. Mexico has experienced an increase in the share of manufactured goods in total exports that makes export structure more competitive with Asian countries. Because of this fact their trade balances may become independent from financial flows. China is also chosen as an outlier due its high amount of trade balances and extremely controlled capital flows. Lastly Korea is excluded

since it is now considered as “high income” country and reduced capital controls in last 5 years might result in a deviation in estimation results.

3.3.3 Results

In this work two models are analyzed for two set of countries. First model illustrates the interrelated relationship between percentage change in real effective exchange rate ($PREER_{it}$), portfolio investment inflows as percentage of nominal GDP ($PILG_t$) and trade balances as percentage of nominal GDP (TBG_{it}). Second model illustrates the interdependence between foreign direct investment inflows as percentage of nominal GDP $FDILG_t$, $PREER_{it}$ and TBG_{it}. First model is shown as;

$$\begin{pmatrix} PIL_{it} \\ REER_{it} \\ TB_{it} \end{pmatrix} = \Pi_1 \begin{pmatrix} PIL_{it-1} \\ REER_{it-1} \\ TB_{it-1} \end{pmatrix} + \Pi_2 \begin{pmatrix} PIL_{it-2} \\ REER_{it-2} \\ TB_{it-2} \end{pmatrix} + \cdots + \Pi_{\mathrm{k}} \begin{pmatrix} PIL_{it-k} \\ REER_{it-k} \\ TB_{it-k} \end{pmatrix} + e_{it}^{*} \qquad (3.16)$$

Second model can be illustrated as;

$$\begin{pmatrix} FDIL_{it} \\ REER_{it} \\ TB_{it} \end{pmatrix} = \Pi_1 \begin{pmatrix} FDIL_{it-1} \\ REER_{it-1} \\ TB_{it-1} \end{pmatrix} + \Pi_2 \begin{pmatrix} FDIL_{it-2} \\ REER_{it-2} \\ TB_{it-2} \end{pmatrix} + \cdots + \Pi_{\mathrm{k}} \begin{pmatrix} FDIL_{it-k} \\ REER_{it-k} \\ TB_{it-k} \end{pmatrix} + e_{it}^{*} \qquad (3.17)$$

These two models are applied to both Latin American and Asian countries. The results will be illustrated respectively. As it is mentioned in former sections, the empirical analysis starts with model selection (lag selection). In tables 3.2 and 3.3, model and moment selection criteria (MMSC) of models I and II for both Latin American and Asian countries are illustrated. In tables 3.2 and 3.3 $MMSC_{BIC}$, $MMSC_{AIC}$ and $MMSC_{HQIC}$ statistics are shown. The lag level which yields the minimum level can be selected as the order of VAR model. According to those results, the lag level 1 gives the minimum level of all information criteria derived by Andrews and Lu (2001). For this reason, the order of VAR models I and II for both type of countries turns out to be one.

Table 3.2: Model\Lag selection criteria for Models I & II for Latin American countries.

All Latin American Countries – Model I				**Latin American Countries- Panama & Mexico are Excluded – Model I**			
Lag	$MMSC_{MBIC}$	$MMSC_{MAIC}$	$MMSC_{MQIC}$	Lag	$MMSC_{MBIC}$	$MMSC_{MAIC}$	$MMSC_{MQIC}$
1	-133.165	-37.8702	-76.2148	1	-127.196	-38.68653	-74.51925
2	-88.0598	-24.53	-50.0931	2	-85.1207	-26.11463	-50.00311
3	-45.61579	-13.85093	-26.63245	3	-40.93225	-11.42921	-23.37346
All Latin American Countries – Model II				**Latin American Countries- Panama & Mexico are Excluded – Model II**			
Lag	$MMSC_{MBIC}$	$MMSC_{MAIC}$	$MMSC_{MQIC}$	Lag	$MMSC_{MBIC}$	$MMSC_{MAIC}$	$MMSC_{MQIC}$
1	-124.797	-29.5023	-67.8468	1	-124.346	-35.8367	-71.6695
2	-82.5846	-19.0549	-44.6179	2	-80.4082	-21.4021	-45.2906
3	-46.6557	-14.8908	-27.6724	3	-42.6649	-13.1618	-25.1061

Table 3.3: Model\Lag selection criteria for Models I & II for Asian countries.

All Asian Countries – Model I				**Asian Countries- China & Korea are Excluded – Model I**			
Lag	$MMSC_{MBIC}$	$MMSC_{MAIC}$	$MMSC_{MQIC}$	Lag	$MMSC_{MBIC}$	$MMSC_{MAIC}$	$MMSC_{MQIC}$
1	-99.5467	-18.9893	-51.7216	1	-91.3406	-24.45248	-51.40002
2	-67.6624	-13.9575	-35.779	2	-57.96342	-13.37136	-31.33638
3	-40.52214	-13.66968	-24.58045	3	-35.64292	-13.34689	-22.3294
All Asian Countries – Model II				**Asian Countries- China & Korea are Excluded – Model II**			
Lag	$MMSC_{MBIC}$	$MMSC_{MAIC}$	$MMSC_{MQIC}$	Lag	$MMSC_{MBIC}$	$MMSC_{MAIC}$	$MMSC_{MQIC}$
1	-105.418	-24.8608	-57.5931	1	-94.102	-27.21394	-54.16148
2	-72.698	-18.9931	-40.8147	2	-62.67952	-18.08746	-36.05248
3	-40.93543	-14.08297	-24.99374	3	-34.87264	-12.57661	-21.5591

The coefficients of the VAR models are used in Granger-Causality tests. Since, the DAG analysis is employed in order to detect the proper ordering for Cholesky decomposition, Granger-Causality and significance of the coefficients are not quite important, but it is worth to do. VAR model provides residual vectors that are needed in DAG analysis. Correlation matrix of the error terms are needed for GES algorithm. Table 3.4 summarizes the results of Model I for Latin American countries. Among all countries $PILG_t$ is found Granger cause of both TBG_t and $PREER_t$, however in the case of except Mexico and Panama $PILG_t$ is found cause of TBG_T.

Table 3.4:VAR Model I for Latin American Countries (*, ** and *** represents 1, 5 and 10 percentage significance levels respectively)

	Latin American Countries-All			**Latin American Countries- Panama & Mexico are Excluded**		
	$PILG_{t-1}$	$PREER_{t-1}$	TBG_{t-1}	$PILG_{t-1}$	$PREER_{t-1}$	TBG_{t-1}
$PILG_t$	0.2744525* (0.0867581)	0.0202849 (0.011033)	-0.0703652 (0.0552048)	0.2735452* (0.0975411)	0.02554*** (0.0091885)	-0.0876294 (0.0550804)
$PREER_t$	0.674135** (0.4328431)	0.1250962 (0.0812821)	0.9102933* (0.3269463)	0.9432153 (0.5345142)	0.1953785 (0.0814915)	0.969122*** (0.3797767)
TBG_t	-0.26917*** (0.0874748)	-0.0196356 (0.0097395)	0.629381* (0.078355)	-0.28145*** (.0993942)	-0.01448** (0.0100468)	0.6613337 (0.0784989)

If all Latin American countries are included, a directional relationship from TBG_t to $PREER_t$ is found, but a bidirectional relationship is found between same variables when Panama and Mexico are excluded. In the case in which Panama and Mexico are excluded $PREER_t$ is found to cause $PILG_t$. Results show that a consistent relationship among cases are not found in Model I for Latin American countries, across cases.

Table 3.5 presents results of VAR model II for Latin American countries. According to results, $FDILG_t$ is found to cause TBG_t for all Latin American countries in the sample, but no relationship is found between them in the model of Latin American countries excluding Panama and Mexico. A bidirectional relationship is found between TBG_t and $PREER_t$ in the case of all Latin American countries, while one directional relationship is found from $PREER_t$ to TBG_t among Latin American countries excluding Mexico and Panama. Again, no consistent relationship is found between variables across cases.

Table 3.6 illustrates estimation results of VAR model I for Asian countries. The results show that $PILG_t$ granger causes both $PREER_t$ and TBG_t in both cases. Additionally, a unidirectional relationship is found from TBG_t to $PREER_t$ while it is not apparent in the case of

Table 3.5: VAR Model II for Latin American Countries (*, ** and *** represents 1, 5 and 10 percentage significance levels respectively)

	Latin American Countries-All			**Latin American Countries- Panama & Mexico are Excluded**		
	$FDILG_{t-1}$	$PREER_{t-1}$	TBG_{t-1}	$FDILG_{t-1}$	$PREER_{t-1}$	TBG_{t-1}
$FDILG_t$	0.7233045* (0.1387873)	0.0015016 (0.0055741)	-0.0822363 (0.0556239)	0.6882789* (0.1580188)	0.0018815 (0.0049337)	-0.0607452 (0.0599686)
$PREER_t$	-0.8739433 (0.7374102)	0.20009** (0.0849594)	0.781242*** (0.4307132)	-1.670532 (1.068251)	0.2204499** (0.0942458)	0.7174467 (0.503945)
TBG_t	-0.4940105* (0.159672)	-0.02492** (0.0103167)	0.6536474* (0.0840962)	-0.1458796 (0.1585753)	-0.025420** (0.0121249)	0.7658129* (0.1012928)

Table 3.6: VAR Model I for Asian Countries (*, ** and *** represents 1, 5 and 10 percentage significance levels respectively)

	Asian Countries-All			**Asian Countries-China and Korea are excluded**		
	$PILG_{t-1}$	$PREER_{t-1}$	TBG_{t-1}	$PILG_{t-1}$	$PREER_{t-1}$	TBG_{t-1}
$PILG_t$	0.684947* (0.1368082)	-0.0009644 (0.0100545)	0.0305213 (0.05325)	0.81590* (0.1205064)	-0.0064754 (0.0100765)	0.0003439 (0.0648371)
$PREER_t$	0.77187** (0.3630368)	0.0235998 (0.1159119)	0.64434** (0.2704297)	0.684480** (0.2840059)	-0.0923271 (0.1086403)	0.3717216 (0.2415077)
TBG_t	0.332513*** (0.1829216)	-0.0200344 (0.0247305)	0.9102996* (0.0860524)	0.637275* (0.1707435)	-0.037145 (0.0337621)	1.025115 (0.1004251)

Asian countries when China and Korea are excluded. In this case, the effects of $PILG_t$ on both TBG_t and $PREER_t$ is consistent across cases.

Results of VAR Model II for Asian countries are illustrated at Table 3.7. In all Asian countries case, bidirectional relationship is found between $FDILG_t$ and $PREER_t$. The same type of relationship is also valid between TBG_t and $PREER_t$. In the case of Asian countries excluding China and Korea, $FDILG_t$ is found to Granger cause both TBG_t and $PREER_t$, additionally a unidirectional relationship from TBG_t to $PRERR_t$ is detected. The most interesting outcome of the

Table 3.7:VAR Model I for Asian Countries (*, ** and *** represents 1, 5 and 10 percentage significance levels respectively)

	Asian Countries-All			**Asian Countries-China and Korea is excluded**		
	$FDILG_{t-1}$	$PREER_{t-1}$	TBG_{t-1}	$FDILG_{t-1}$	$PREER_{t-1}$	TBG_{t-1}
$FDILG_t$	0.6840016* (0.0995412)	-0.019354** (0.0081828)	-0.0014796 (0.01746)	0.633585* (0.112706)	-0.0324489* (0.0104674)	-0.0121428 (0.0178356)
$PREER_t$	1.6269** (0.7613842)	0.18698*** (0.0965032)	0.25141** (0.1218895)	3.32068* (0.8838239)	0.1165759 (0.1065957)	0.3474155** (0.1631519)
TBG_t	0.545034 (0.3826663)	-0.06151*** (0.0321565)	0 .874886* (0.0651253)	0.7119484* (0.276272)	-0.0407837 (0.0286748)	0.9584862* (0.063315)

coefficient estimates are the signs of the coefficient estimates of both capital flows in the model when TBG_t is dependent. As it can be seen from tables 3.5, 3.6 and 3.7, capital flows have a negative effect on trade balances among Latin American countries while they have a positive effect among Asian countries. This gives an insight into possible effects of directed capital flows on trade balances. Since bidirectional relationship is found between the variables in the model, the proper directional relationship between residuals cannot be retrieved from VAR estimates. In order to find a definite and unidirectional relationship between the variables, DAG analysis will be employed.

In DAG analysis GES algorithm is employed. GES algorithm employs scoring process to yield a causal pattern between variables. In the scoring process, and adjusted Bayesian Information Criterion (BIC) is used. BIC is adjusted in the direction of congestion for larger models. Adjusted BIC is defined as follow;

$$2L - ckln(n) \tag{3.18}$$

where $L = P(V|D) = \sum_{i=1}^{n} lnP(V_i|pa(V_i), D)$. D is the data set for V_i variables in a DAG. n is the number of samples, c is the penalty discount and k is the number of parameters in causal Bayesian network which is in this case number of possible edges. Usually penalty discount is

Table 3.8: GES Algorithm Results for Latin American Countries

	Latin American Countries					**Latin American Countries- Panama & Mexico are Excluded**				
	Penalty Discount, *c*					**Penalty Discount, *c***				
VAR (I)	0.1	0.5	1	2	3	0.1	0.5	1	2	3
$PILG_t \rightarrow TBG_t$	x	x	x	x	x	o	x	x	x	x
$PILG_t \rightarrow PREER_t$	x	o	o	x	x	o	o	x	x	x
$PREER_t \rightarrow TBG_t$	x	o	o	x	x	x	o	x	x	x
$PREER_t \rightarrow PILG_t$	o	x	x	x	x	x	x	x	x	x
$TBG_t \rightarrow PILG_t$	o	x	x	x	x	x	x	x	x	x
$TBG_t \rightarrow PREER_t$	o	x	x	o	x	o	x	x	x	x
	Penalty Discount, *c*					**Penalty Discount, *c***				
VAR (II)	0.1	0.5	1	2	3	0.1	0.5	1	2	3
$FDILG_t \rightarrow TBG_t$	o	o	o	x	x	o	x	x	x	x
$FDLG_t \rightarrow PREER_t$	x	x	x	x	x	x	x	x	x	x
$PREER_t \rightarrow TBG_t$	x	x	x	x	x	x	x	x	x	x
$PREER_t \rightarrow FDILG_t$	o	o	x	x	x	o	x	x	x	x
$TBG_t \rightarrow FDILG_t$	x	x	x	x	x	x	x	x	x	x
$TBG_t \rightarrow PREER_t$	x	x	x	x	x	x	o	o	x	x

specified as 2. However, in this work the lowest penalty discount that produces common connections between cases will be used. The main reason for this kind of specification is lower levels of serial correlations between residual variables that are retrieved as the outcome of VAR analysis.

Table 3.8 illustrates the different causal links between variables in VAR models I and II under different penalty discounts that 0.1, 0.5, 1,2 and 3, among Latin American countries. “x”, and “o” refer to independence and causal link between variables under investigation, respectively.

According to Table 3.8, Latin American countries in both cases have common causal links from $PILG_t$ to $PREER_t$ and from $PREER_t$ to TBG_t at 0.5 penalty discount.0.5 penalty discount is chosen because it is the lowest level of penalty discount that gives same type of causality across cases.

Table 3.8 also reveals results for VAR model II for Latin American countries. According to the table at 0.1 penalty discount two causal links are detected. First is from $FDILG_t$ to TBG_t

and second is from $PREER_t$ to $FDILG_t$. According to GES algorithm search results residuals of $TBG_t$and residuals of $PREER_t$ are found independent from each other. Ordering level is not quite important between residuals of TBG_t and $PREER_t$.

Figure 3.2 and 3.3 are DAGs related with innovations obtained from VAR models I and II. DAGs summarizes the results mentioned in Table 3.8. The ordering mentioned in these figures will be used in determination of ordering in FEVD and OIRF analysis.

Table 3.9 illustrates GES algorithm search results of residual variables obtained from VAR models I and II for Asian countries. In VAR model I, Asian countries have different causal patterns

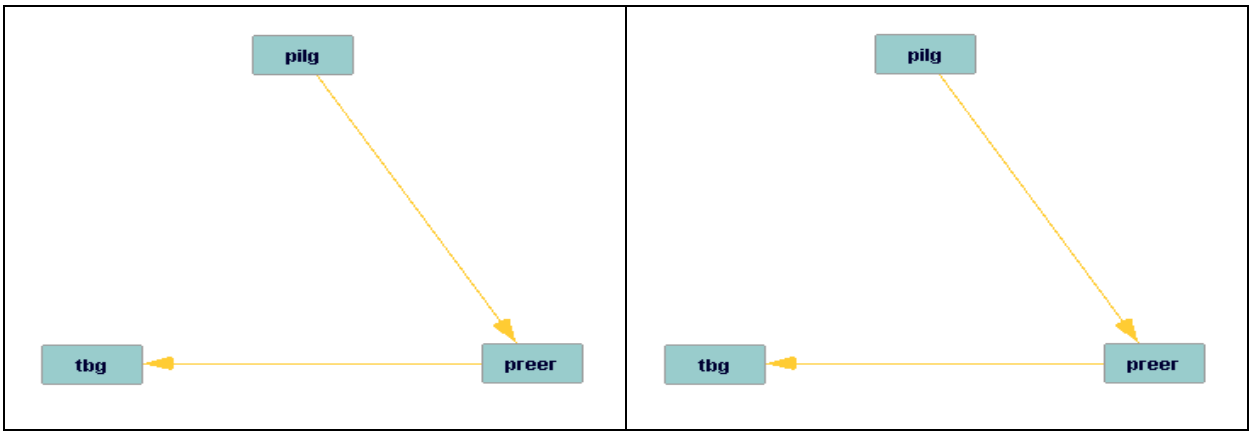

Figure 3.2: DAGs obtained from VAR model I for all Latin American countries (left) and Latin American countries except Panama & Mexico (right) (c=0.5).

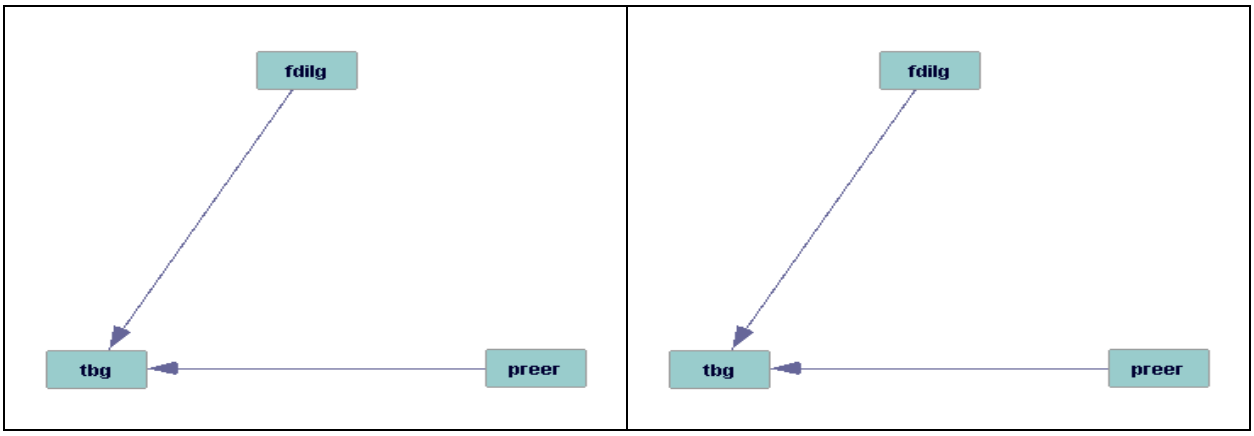

Figure 3.3:DAGs obtained from VAR model II for all Latin American countries (left) and Latin American countries except Panama & Mexico (right) (c=0.1).

between residuals variables of $PILG_t$,$PREER_t$ and TBG_t than Latin American countries (with a 0.5 penalty discount). $PILG_t$ and TBG_t are found independent from each other, while both $PILG_t$ and TBG_t causes $PREER_t$. However, at model VAR II for Asian countries residual variables in the system are found exogenous at 0.5 penalty discount. A causal pattern is detected at 0.1 penalty discount in all Asian countries case, but this pattern cannot be verified when China and Korea are excluded from the analysis. Figures 3.4 and 3.5 summarizes the causal patterns illustrated in Table 3.9. The proper ordering for Cholesky decomposition.

Table 3.9: GES Algorithm Results for Asian Countries

	Asian Countries **Penalty Discount, *c***					**Asian Countries – China & Korea are excluded** **Penalty Discount, *c***				
VAR (I)	0.1	0.5	1	2	3	0.1	0.5	1	2	3
$PILG_t \rightarrow TBG_t$	o	x	x	x	x	x	x	x	x	x
$PILG_t \rightarrow PREER_t$	o	o	x	x	x	o	o	x	x	x
$PREER_t \rightarrow TBG_t$	x	x	x	x	x	x	x	x	x	x
$PREER_t \rightarrow PILG_t$	x	x	x	x	x	x	x	x	x	x
$TBG_t \rightarrow PILG_t$	x	x	x	x	x	x	x	x	x	x
$TBG_t \rightarrow PREER_t$	o	o	o	x	x	o	o	x	x	x
	Penalty Discount, *c*					**Penalty Discount, *c***				
VAR (II)	0.1	0.5	1	2	3	0.1	0.5	1	2	3
$FDILG_t \rightarrow TBG_t$	x	x	x	x	x	x	x	x	x	x
$FDLG_t \rightarrow PREER_t$	x	x	x	x	x	x	x	x	x	x
$PREER_t \rightarrow TBG_t$	x	x	x	x	x	x	x	x	x	x
$PREER_t \rightarrow FDILG_t$	o	x	x	x	x	x	x	x	x	x
$TBG_t \rightarrow FDILG_t$	o	x	x	x	x	o	x	x	x	x
$TBG_t \rightarrow PREER_t$	o	x	x	x	x	o	x	x	x	x

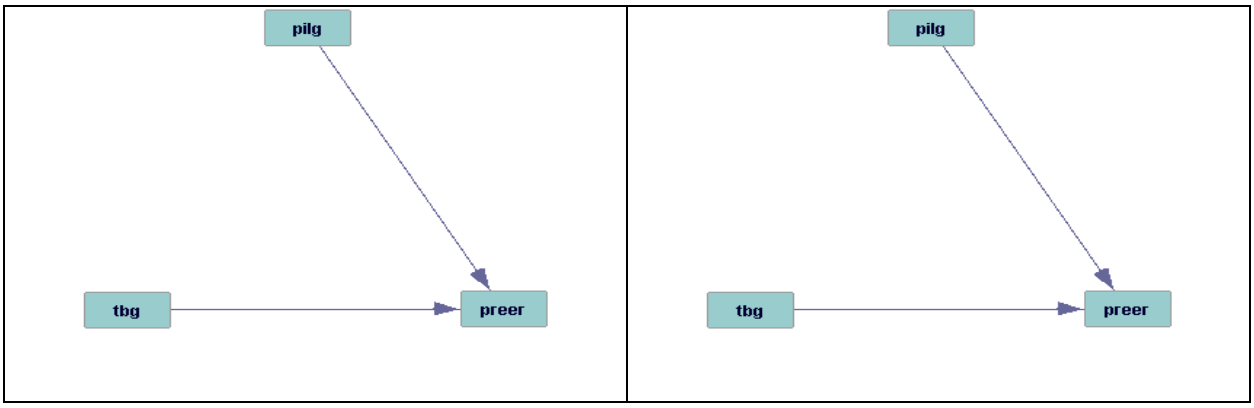

Figure 3.4: DAGs obtained from VAR model I for all Asian countries (left) and Asian countries except China & Korea (right) (c=0.5).

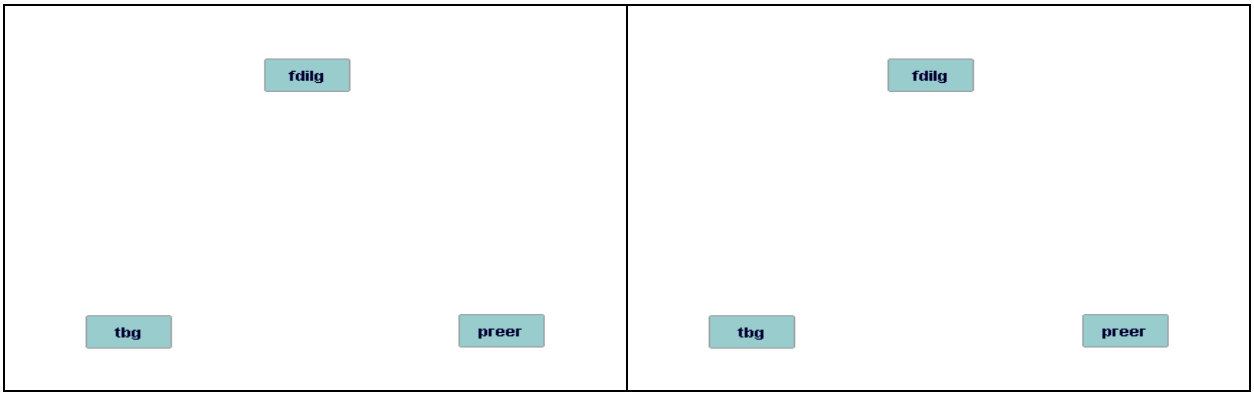

Figure 3.5: DAGs obtained from VAR model II for all Asian countries (left) and Asian countries except China & Korea (right) (c=0.5).

The covariance stationarity of VAR models in this work must be checked before forecast error variance decomposition and orthogonalized impulse response functions analysis. A VAR(k) system is stationary when all eigenvalues of the companion matrix are less than one. VAR models for both set of countries satisfy stability conditions that are mentioned, before except VAR II model for Asian countries when Korea and China are excluded. This is illustrated in Figures 3.6 and 3.7.

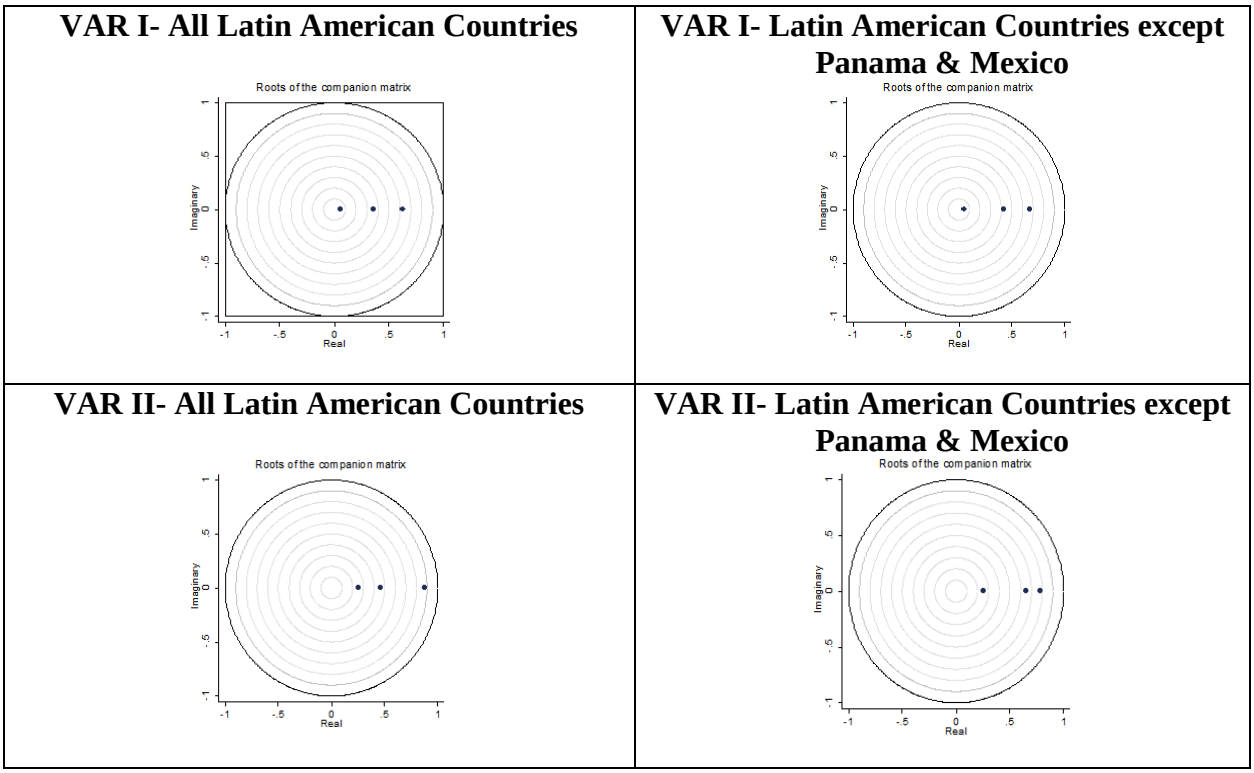

Figure 3.6: Stability conditions of VAR model I & II for Latin American Countries (1986-2014)

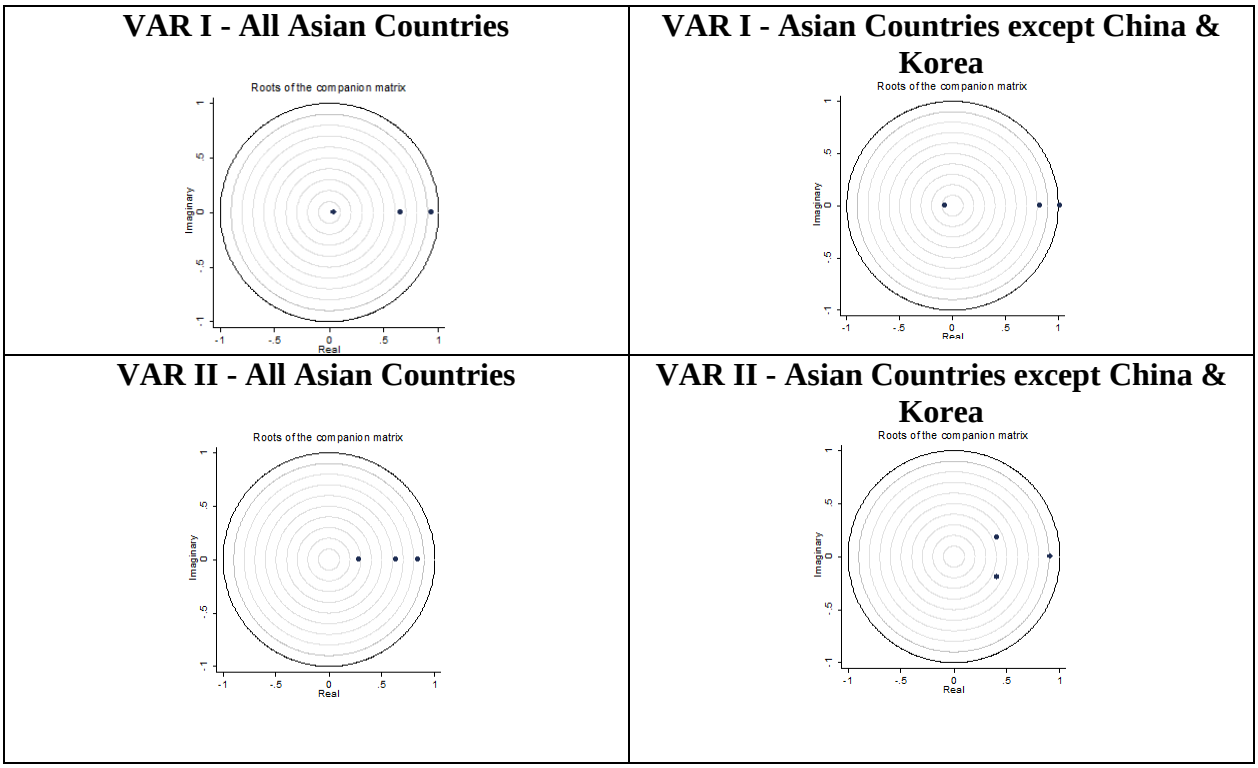

Figure 3.7: Stability conditions of VAR model I & II for Asian Countries (1984-2014)

FEVD analysis informs about exogenous/endogenous nature of variables in the VAR system. After estimation results and stability analysis, the impact of capital flows on trade balance is illustrated through FEVD analysis. Table 3.10 illustrates FEVD analysis of VAR model I for Latin American countries. In the right-hand side of the table results for All countries are illustrated. When $PILG_t$ is specified as response variable, 2.5 percent of variations are explained by $PREER_t$ and 1.1 percent is explained by TBG_t. That shows that $PILG_t$ can be considered as the most exogenous variable in the system. In the case that $PREER_t$ was chosen as a response variable, almost 4.6 percent of variations are explained by $PIILG_t$ that is higher than the opposite case, 2.5. In this case, it can be inferred that portfolio investments leads to effects real exchange rate appreciation, with 5.6 percent of variations in $PREER_t$ explained by TBG_t. When TBG_t is chosen as response variable, 12 percent and 8 percent of the variation is explained by $PILG_t$and TBG_t,

respectively. Results do not vary in the case of Latin American countries when Panama and Mexico are excluded.

The results presented at Table 3.10 suggest that portfolio inflows and real exchange rate appreciation impact trade balances. Real exchange rate appreciation is found to have effect on portfolio investments and trade balances.

Tables 3.11 and 3.12 illustrate results of VAR model II for Latin American countries. These two tables illustrate results for different orderings. Since error terms of $FDILG_t$ and $PREER_t$ are found exogenous to each other and cause to TBG_t, their rank in the structure of ordering can bring about different results. Results relating to two types of ordering are illustrated. Table 3.11 illustrates results of VAR model II for all Latin American countries. As in the case of model I, $FDILG_t$ explains 0.18 percent of variations in $PREER_t$ and 0.46 percent in TBG_t. $PREER_t$ is

Table 3.10: FEVD results of VAR model I for Latin American countries.

VAR I - Latin American Countries				**VAR I - Latin American Countries-Panama & Mexico are Excluded**			
Response Variable & Forecast Horizon	**Order Detected** $PILG_t \rightarrow PREER_t \rightarrow TBG_t$ **Order Applied** $PILG_t \rightarrow PREER_t \rightarrow TBG_t$			Response variable & Forecast horizon	**Order Detected** $PILG_t \rightarrow PREER_t \rightarrow TBG_t$ **Order Applied** $PILG_t \rightarrow PREER_t \rightarrow TBG_t$		
	Impulse Variable				Impulse Variable		
$\boldsymbol{PILG_t}$	$\boldsymbol{PILG_t}$	$\boldsymbol{PREER_t}$	$\boldsymbol{TBG_t}$	$\boldsymbol{PILG_t}$	$\boldsymbol{PILG_t}$	$\boldsymbol{PREER_t}$	$\boldsymbol{TBG_t}$
1	1	0	0	1	1	0	0
2	0.972928	0.019785	0.007287	2	0.952083	0.037376	0.010541
5	0.963283	0.025249	0.011467	5	0.933718	0.049572	0.01671
10	0.962937	0.025358	0.011705	10	0.932933	0.049898	0.017169
$\boldsymbol{PREER_t}$	$\boldsymbol{PILG_t}$	$\boldsymbol{PREER_t}$	$\boldsymbol{TBG_t}$	$\boldsymbol{PREER_t}$	$\boldsymbol{PILG_t}$	$\boldsymbol{PREER_t}$	$\boldsymbol{TBG_t}$
1	0.035302	0.964698	0	1	0.024525	0.975475	0
2	0.043594	0.92457	0.031836	2	0.040821	0.931493	0.027686
5	0.044995	0.899984	0.055021	5	0.041672	0.903892	0.054436
10	0.045928	0.897603	0.056469	10	0.043191	0.899654	0.057155
$\boldsymbol{TBG_t}$	$\boldsymbol{PILG_t}$	$\boldsymbol{PREER_t}$	$\boldsymbol{TBG_t}$	$\boldsymbol{TBG_t}$	$\boldsymbol{PILG_t}$	$\boldsymbol{PREER_t}$	$\boldsymbol{TBG_t}$
1	0.019102	0.052655	0.928243	1	0.019484	0.063142	0.917375
2	0.074284	0.071692	0.854024	2	0.077418	0.078322	0.84426
5	0.122502	0.087238	0.79026	5	0.132855	0.100408	0.766737
10	0.126454	0.088465	0.785081	10	0.13956	0.103451	0.75699

found more dependent to TBG_t than TBG_t's dependence on $PREER_t$. High share of $FDILG_t$ in total variations of TBG_t, can be the effect of "Panama" which attracts a high amount of capital flows with respect to the size of the economy. The right-hand side of the table shows the results for ordering where $PEER_t$ is considered as the most exogenous variable. Results do not vary on this condition too.

Table 3.12 illustrates results for Latin American countries except Mexico and Panama. Results show that 7 percent of the total variations in $FDILG_t$is explained by TBG_t, while 4 percent of total variations in TBG_t is explained by $FDILG_t$. $FDILG_t$ explains 8.6 percent of the total variations in $PREER_t$ and 12.3 percent of the variations in TBG_t is explained through $PREER_t$. According to these results, real exchange rate appreciation still has significant explanatory power on trade balances while trade balances are found to be more exogenous from FDI flows than it is from portfolio investments flows. Results also do not vary with the change Cholesky ordering.

Table 3.11: FEVD results of VAR model II for All Latin American countries.

VAR II – All Latin American Countries							
Response Variable & Forecast Horizon	**Order Detected** $PREER_t \rightarrow TBG_t \leftarrow FDILG_t$ **Order Applied** $FDILG_t \rightarrow PREER \rightarrow TBG$			Response Variable & Forecast Horizon	**Order Detected** $PREER_t \rightarrow TBG_t \leftarrow FDILG_t$ **Order Applied** $PREER_t \rightarrow FDILG_t \rightarrow TBG_t$		
	Impulse Variable				Impulse Variable		
$FDILG_t$	$FDILG_t$	$PREER_t$	TBG_t	$FDILG_t$	$FDILG_t$	$PREER_t$	TBG_t
1	1	0	0	1	0.9999264	7.37E-05	0
2	0.990996	0.000439	0.008564	2	0.9911376	0.000298	0.008564
5	0.959468	0.003363	0.037169	5	0.9600611	0.00277	0.037169
10	0.940634	0.005517	0.053849	10	0.9414498	0.004701	0.053849
$PREER_t$	$FDILG_t$	$PREER_t$	TBG_t	$PREER_t$	$FDILG_t$	$PREER_t$	TBG_t
1	7.37E-05	0.999926	0	1	0	1	0
2	0.024508	0.950938	0.024554	2	0.0239838	0.951462	0.024554
5	0.119391	0.820316	0.060293	5	0.1191236	0.820583	0.060293
10	0.180088	0.750583	0.069329	10	0.1800323	0.750639	0.069329
TBG_t	$FDILG_t$	$PREER_t$	TBG_t	TBG_t	$FDILG_t$	$PREER_t$	TBG_t
1	0.035555	0.018306	0.946139	1	0.0359914	0.01787	0.946139
2	0.150528	0.03621	0.813262	2	0.1517624	0.034976	0.813262
5	0.368213	0.038359	0.593428	5	0.3700877	0.036484	0.593428
10	0.4615	0.034707	0.503793	10	0.4634373	0.03277	0.503793

Table 3.12: FEVD results of VAR model II for Latin American countries, except Panama & Mexico.

VAR II -Latin American Countries-Panama & Mexico Excluded							
Response Variable & Forecast Horizon	**Order Detected** $PREER_t \rightarrow TBG_t \leftarrow FDILG_t$ **Order Applied** $FDILG_t \rightarrow PREER \rightarrow TBG$			Response Variable & Forecast Horizon	**Order Detected** $PREER_t \rightarrow TBG_t \leftarrow FDILG_t$ **Order Applied** $PREER_t \rightarrow FDILG_t \rightarrow TBG_t$		
	Impulse Variable				Impulse Variable		
$FDILG_t$	$FDILG_t$	$PREER_t$	TBG_t	$FDILG_t$	$FDILG_t$	$PREER_t$	TBG_t
1	1	0	0	1	0.999974	0.000026	0
2	0.9904073	0.001372	0.008221	2	0.990597	0.0011815	0.008221
5	0.9446532	0.009512	0.045835	5	0.945205	0.0089604	0.045835
10	0.9134719	0.015622	0.070906	10	0.914136	0.0149575	0.070906
$PREER_t$	$FDILG_t$	$PREER_t$	TBG_t	$PREER_t$	$FDILG_t$	$PREER_t$	TBG_t
1	0.000026	0.999974	0	1	0	1	0
2	0.0296567	0.955091	0.015252	2	0.029312	0.9554356	0.015252
5	0.0781578	0.865452	0.05639	5	0.077961	0.8656485	0.05639
10	0.0867159	0.840744	0.07254	10	0.086597	0.8408634	0.07254
TBG_t	$FDILG_t$	$PREER_t$	TBG_t	TBG_t	$FDILG_t$	$PREER_t$	TBG_t
1	0.0121221	0.051989	0.935889	1	0.012379	0.0517317	0.935889
2	0.0226911	0.089235	0.888074	2	0.023152	0.0887746	0.888074
5	0.036724	0.118565	0.844711	5	0.037396	0.1178939	0.844711
10	0.0415939	0.122946	0.83546	10	0.042317	0.1222229	0.83546

In the case of all Latin American countries trade balances used to be highly dependent on FDI flows, however that fact changes dramatically after Panama and Mexico are excluded from the analysis. Dynamic relationship between capital flows, real exchange rate appreciation and trade balances has to be analyzed for Asian countries, too. Table 3.13 illustrates FEVD results of VAR I model for all Asian countries. Likewise, as in the case of VAR II model for Latin American countries, innovations related with $PILG_t$ and TBG_t are found to be exogenous to each other, but found determinant in $PREER_t$ through DAG analysis. Two ordering structures are illustrated to show whether results have changed significantly when ordering structure had changed.

Table 3.14 summarizes the FEVD results of VAR II model for all Asian countries with different ordering structures since all innovation variables are found to be exogenous to each other. At the right-hand side of the table $FDILG_t$ is specified as the most exogenous variable and TBG_t

Table 3.13: FEVD results of VAR model I for all Asian countries

VAR I - All Asian Countries							
Response Variable & Forecast Horizon	**Order Detected** $PILG_t \rightarrow PREER_t \leftarrow TBG$ **Order Applied** $PILG_t \rightarrow TBG_t \rightarrow PREER$			Response Variable & Impulse Horizon	**Order Detected** $PILG_t \rightarrow PREER_t \leftarrow TBG$ **Order Applied** $TBG_t \rightarrow PILG_t \rightarrow PREER$		
	Impulse Variable				Impulse Variable		
$PILG_t$	$PILG_t$	$PREER_t$	TBG_t	$PILG_t$	$PILG_t$	$PREER_t$	TBG_t
1	1	0	0	1	0.997702	0	0.002299
2	0.998298	1.04E-05	0.001692	2	0.993779	1.04E-05	0.00621
5	0.985555	6.07E-05	0.014385	5	0.976809	6.07E-05	0.02313
10	0.963566	0.000137	0.036297	10	0.952282	0.000137	0.04758
$PREER_t$	$PILG_t$	$PREER_t$	TBG_t	$PREER_t$	$PILG_t$	$PREER_t$	TBG_t
1	0.018291	0.91352	0.06819	1	0.021788	0.91352	0.064693
2	0.051843	0.834935	0.113221	2	0.051023	0.834935	0.114042
5	0.113154	0.682393	0.204453	5	0.104051	0.682393	0.213556
10	0.156369	0.578212	0.265419	10	0.141574	0.578212	0.280214
TBG_t	$PILG_t$	$PREER_t$	TBG_t	TBG_t	$PILG_t$	$PREER_t$	TBG_t
1	0.002299	0	0.997702	1	0	0	1
2	0.032279	0.001352	0.96637	2	0.020764	0.001352	0.977884
5	0.130777	0.002044	0.86718	5	0.105197	0.002044	0.89276
10	0.212188	0.002103	0.785709	10	0.179435	0.002103	0.818463

Table 3.14: FEVD results of VAR model II for all Asian countries

VAR II – All Asian Countries							
Response Variable & Forecast Horizon	**Order Detected** $FDILG_t \times PREER_t \times TBG_t$ **Order Applied** $FDILG_t \rightarrow PREER_t \rightarrow TBG_t$			Response Variable & Forecast Horizon	**Order Detected** $FDILG_t \times PREER_t \times TBG_t$ **Order Applied** $TBG_t \rightarrow FDILG_t \rightarrow PREER_t$		
	Impulse Variable				Impulse Variable		
$FDILG_t$	$FDILG_t$	$PREER_t$	TBG_t	$FDILG_t$	$FDILG_t$	$PREER_t$	TBG_t
1	1	0	0	1	0.993161	0	0.006839
2	0.980042	0.01845	0.001509	2	0.97688	0.01845	0.00467
5	0.964599	0.033524	0.001877	5	0.96127	0.033524	0.005206
10	0.961099	0.033787	0.005114	10	0.957188	0.033787	0.009026
$PREER_t$	$FDILG_t$	$PREER_t$	TBG_t	$PREER_t$	$FDILG_t$	$PREER_t$	TBG_t
1	0.00626	0.903858	0.089883	1	0.002922	0.903858	0.09322
2	0.039079	0.875597	0.085324	2	0.036774	0.875597	0.087629
5	0.079206	0.818709	0.102085	5	0.08198	0.818709	0.099311
10	0.084085	0.806608	0.109308	10	0.088058	0.806608	0.105334
TBG_t	$FDILG_t$	$PREER_t$	TBG_t	TBG_t	$FDILG_t$	$PREER_t$	TBG_t
1	0.006839	0	0.993161	1	0	0	1
2	0.007042	0.013545	0.979413	2	0.012945	0.013545	0.97351
5	0.027131	0.037543	0.935326	5	0.04893	0.037543	0.913527
10	0.042107	0.047114	0.910779	10	0.069895	0.047114	0.882991

is specified as least exogenous. In this case, almost zero percent of total variations in $FDILG_t$ is explained by TBG_t. In this case, trade balances do not have much effect in determining of foreign direct investments. 8.4 and 10.9 percent of total variations in $PREER_t$ is explained by $FDILG_t$ and TBG_t respectively. Lastly, 4.2 percent and 4.7 percent of total variations in TBG_t is explained by $FDILG_t$ and $PREER_t$, respectively. From these results, it can be understood that $FDILG_t$ is exogenous to TBG_t, while TBG_t is more dependent on $FDILG_t$. Secondly, $FDILG_t$ is also determines $PREER_t$. Finally, TBG_t plays significant role in determination of $PREER_t$, and its effect is higher than the effect of $PREER_t$ on TBG_t.

Results for different ordering structure is illustrate at the right-hand side of Table 3.14. In this case $TBG_t$is specified as most exogenous. Even in this case relative effects do not change while the effect of $FDILG_t$ on TBG_t increases by two percent.

Table 3.15 illustrates the results for VAR model II for Asian countries after Korea and China are excluded from the analysis. Results change with the exclusion of Korea and China. In the first ordering structure that is illustrated at the right-hand side of the table, the effect of $FDILG_t$ on $PREER_t$ increases to 19.7 percent, while variations in $FDILG_t$ that is attributed to TBG_t increases to 6.8 percent from almost zero percent. When the ordering structure changed, both TBG_t and $FDILG_t$ determine each other equally. Despite conflicted results, the effect of $FDILG_t$ on $PREER_t$is still apparent across cases.

FEVD results of VAR I and II models for Asian and Latin American countries give an insight into the roles of each variables in the determination of the other. From this analysis, we conclude that movements in the $REER_t$ and TBG_t are determined by portfolio flows. The results for model II is different, when all Latin American countries are included. Foreign direct investments are found to have a significant effect on trade balances and real exchange rate

Table 3.15: FEVD results of VAR model II for all Asian countries after Korea & China are excluded

VAR II - Asian Countries-China & Korea are Excluded							
Response Variable & Forecast Horizon	**Order Detected** $FDILG_t \times PREER_t \times TBG_t$ **Order Applied** $FDILG_t \rightarrow PREER_t \rightarrow TBG_t$			Response Variable & Forecast Horizon	**Order Detected** $FDILG_t \times PREER_t \times TBG_t$ **Order Applied** $TBG_t \rightarrow FDILG_t \rightarrow PREER_t$		
	Impulse Variable				Impulse Variable		
$FDILG_t$	$FDILG_t$	$PREER_t$	TBG_t	$FDILG_t$	$FDILG_t$	$PREER_t$	TBG_t
1	1	0	0	1	0.9825154	0	0.017485
2	0.948519	0.05143	5.18E-05	2	0.9309623	0.05143	0.017608
5	0.898828	0.075683	0.02549	5	0.8772213	0.075683	0.047096
10	0.857748	0.074232	0.06802	10	0.8407347	0.074232	0.085033
$PREER_t$	$FDILG_t$	$PREER_t$	TBG_t	$PREER_t$	$FDILG_t$	$PREER_t$	TBG_t
1	0.002912	0.984391	0.012697	1	0.0014893	0.984391	0.01412
2	0.124494	0.852216	0.02329	2	0.1315779	0.852216	0.016206
5	0.198388	0.754065	0.047547	5	0.2161973	0.754065	0.029738
10	0.197814	0.748756	0.05343	10	0.2162371	0.748756	0.035007
TBG_t	$FDILG_t$	$PREER_t$	TBG_t	TBG_t	$FDILG_t$	$PREER_t$	TBG_t
1	0.017485	0	0.982515	1	0	0	1
2	0.012499	0.005579	0.981922	2	0.0224666	0.005579	0.971955
5	0.030334	0.027326	0.94234	5	0.0718705	0.027326	0.900804
10	0.037975	0.038113	0.923913	10	0.0890144	0.038113	0.872873

appreciation, additionally real exchange rate is not found to be effective in determining of trade balances. Further, the effect of foreign direct investments on trade balances is not found to be significant since magnitude of the effect decreases sharply after exclusion of Panama and Mexico. From this perspective, the most robust result which is valid for Latin American countries, is the effect of portfolio investment inflows on trade balances through real exchange rate appreciation.

Results for Asian countries are more ambiguous and are not robust across different cases. In VAR model I, portfolio investment inflows are found to determine the change in real exchange and trade balances. However, the effect of percentage change in real exchange rate is quite negligible. Since the VAR I system for Asian countries after China and Korea are excluded was not found stable, FEVD results for the model is not considered in the analysis. In the VAR model

II for all Asian countries $FDILG_t$ is found effective in determination of TBG_t and $PREER_t$. However, differently from Latin American countries $PREER_t$ is not found effective on TBG_t.Results for VAR model II for Asian countries after China and Korea are excluded, vary dramatically and the relationship from TBG_t to $FDILG_t$ becomes important. However, this fact changes when ordering is changed, TBG_t and $FDILG_t$ become equally endogenous to each other.

FEVD analysis gives important insight about the level of exogeneity but does not inform researchers about the significance and the direction of these effects. In order to make a prediction about the sign of the effects, the model has to be investigated through impulse response functions (IRFs). IRFs inform researchers about a reaction of a variable to a shock from another variable in the system. The shock is defined as the one standard deviation of the variable under investigation. The significance of IRFs are interpreted through confidence intervals that is derived through Monte Carlo simulation on the base of Gaussian approximation. (Abrigo & Love, 2016) If lower and upper bounds of the confidence intervals share same signs the response can be considered as significantly different than zero at the level where it is found through one minus the percentage of the significance level. (Ilzetzki, Mendoza , & Végh, 2013; Gonzalez-Garcia, Lemus, & Mrkaic , 2013)

Figure 3.8 illustrates the IRFs describing the relations from portfolio investments to trade balances, from real exchange rate appreciation to trade balances and from portfolio investments to real exchange rate appreciation. This relationship summarizes the relationship derived Chapter II. In this part of the analysis the effect and significance of this effect is evaluated through IRFs. In the first graphs of both sets of Latin American countries, one standard deviation impulse from $PILG_t$ results with a positive immediate relationship that is significantly different from zero at 10

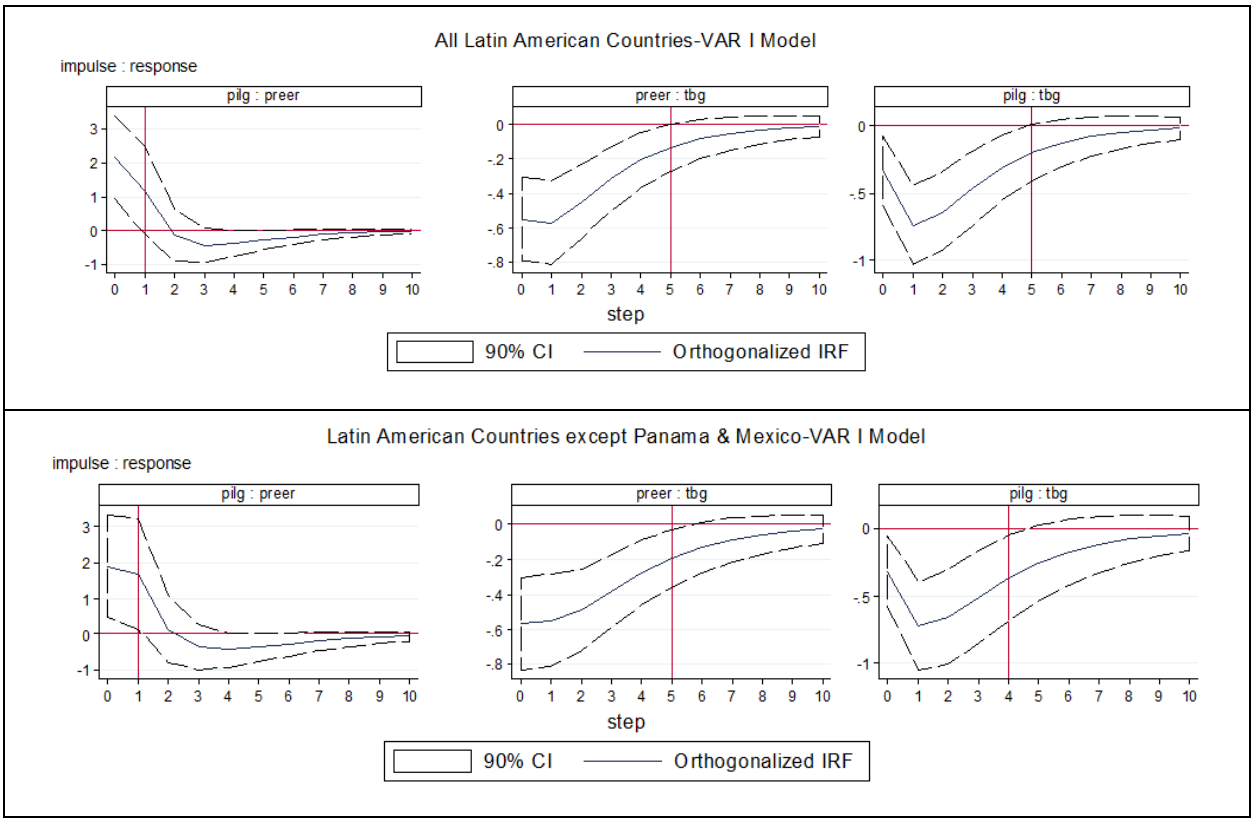

Figure 3.8: Orthogonlized Impulse Response Functions derived from VAR I model for Latin American countries

percent significance level. The response of $PREER_t$ loses its significance after first period. This result confirms that an increase in portfolio investments results with a temporary real exchange rate appreciation. Second graph in the first row of Figure 3.8 illustrates the response of TBG_t to $PREER_t$. One standard deviation impulse from $PREER_t$ results in a decrease in TBG_t which is significant at 10 percent significance level up to fifth forecast horizon.

Graphs in the second row of Figure 3.8 illustrate the results for Latin American countries after Panama and Mexico are excluded. Results do not vary and are found to be robust, but the effect of $PILG_t$ on TBG_t is statistically significant till fourth forecast horizon instead of fifth.

Figure 3.9 illustrates IRFs derived from VAR model II for Latin American countries. Differently from the IRFs derived from VAR model I, $FDILG_t$ negatively effects $PREER_t$. The effect is slightly significant between first and fourth forecast horizon at 10 percent significance

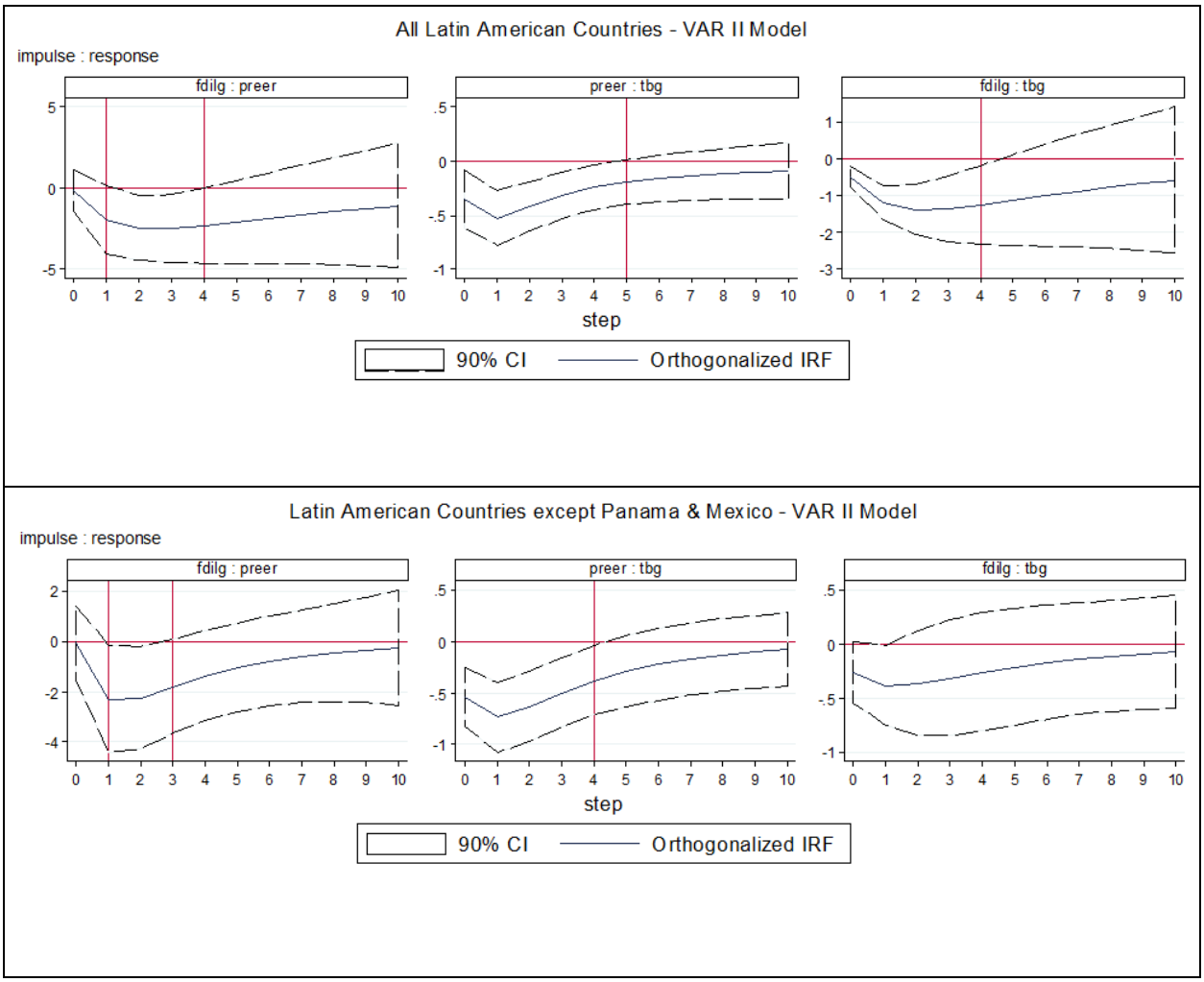

Figure 3.9: Orthogonalized Impulse Response Functions derived from VAR II model for Latin American countries

rate. The response of TBG_t to $PREER_t$ is illustrated in the second graph of the first row of Figure 3.9. As in the case of VAR I model, $PREER_t$ still effects TBG_t negatively at fifth forecast horizon and the effect is statistically different than zero at 10 percent significance level. This also shows that real exchange rate appreciation leads to trade deficits. The effect of $FDILG_t$ on TBG_t is illustrated at the third graph of the first row of Figure 3.9. The negative effect of $FDILG_t$ on $TBG_t$is found significant at 10 percent level at fourth forecast horizon. Figure 3.9 illustrates IRFs derived from VAR model II for Latin American countries. Differently from the IRFs derived from VAR model I, $FDILG_t$ effects negatively $PREER_t$ that is slightly significant between first and

fourth forecast horizon at 10 percent significance rate. The response of TBG_t to $PREER_t$ is illustrated in the second graph of the first row of Figure 3.9. As in the case of VAR I model, $PREER_t$ still effects TBG_t negatively at fifth forecast horizon and the effect is statistically different than zero at 10 percent significance level. This result also shows that real exchange rate appreciation leads to trade deficits. The effect of $FDILG_t$ on TBG_t is illustrated at the third graph of the first row of Figure 3.9. The negative effect of $FDILG_t$ on TBG_t is found significant at 10 percent level at fourth forecast horizon.

The second row of the Figure 3.9 illustrates IRFs for Latin American countries after Panama and Mexico are excluded from the analysis. In this case, the effect of $FDILG_t$ on TBG_t is not found significant. The negative effect of $FDILG_t$ on TBG_t is not found to be robust across cases for Latin American countries. The dynamic relationship between portfolio investments, real exchange rate appreciation is not valid for foreign direct investments. Even if the effect of foreign direct investments on trade balances is negative in the case of all Latin American countries in the medium run, it is not found to be significant after Panama and Mexico are excluded from the analysis.

Figure 3.10 illustrates IRFs that are derived from VAR model I for Asian countries. First graph illustrates the response of $PREER_t$ to a one standard deviation shock from $PILG_t$. The effect is found to be positive and significant during a very short term horizon (second forecast horizon). $PREER_t$ has a negative effect on TBG_t as in the former case. The effect is found to be statistically different from zero, up to fourth forecast horizon. A very short term statistically significant positive effect is detected from $PILG_t$ to TBG_t. The effect is significant until second forecast horizon. This result is a contrast to that for Latin American countries. IRFs related with Asian countries, except Korea and China, are not illustrated due to unstable nature of the system.

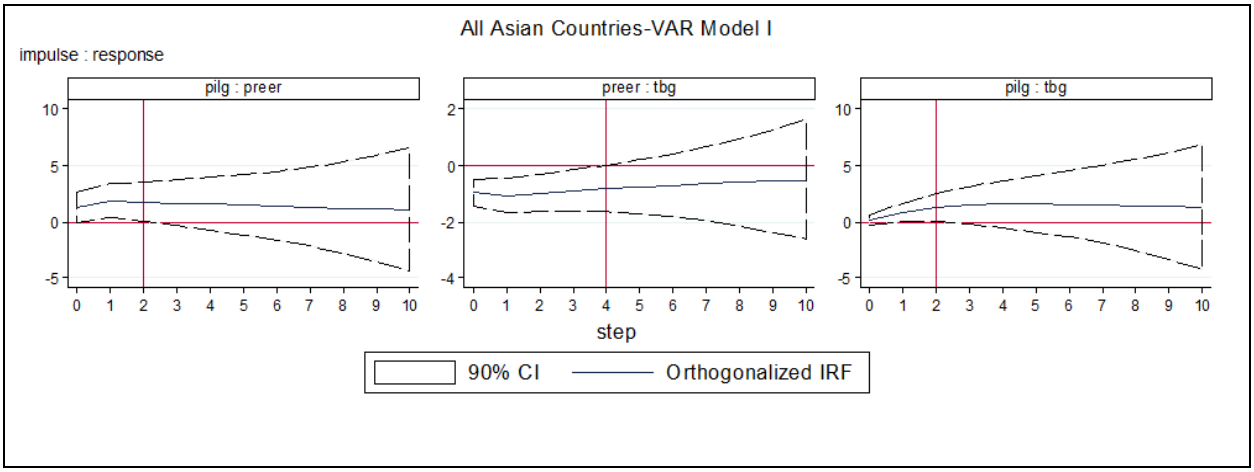

Figure 3.10: Orthogonalized Impulse Response Functions derived from VAR I model for Asian countries

Figure 3.11 summarizes IRFs derived by VAR Model II for Asian countries. First graph in the first row illustrates response function of $PREER_t$ to a one standard deviation impulse from $FDILG_t$. The total effect is positive and statistically significant at fourth forecast horizon.

Relationship between $PREER_t$ and $TBG_t$is illustrated in the next graph. The $PREER_t$ has a long lasting negative effect on TBG_t that is non-zero at a 10 percent significance level. Last graph in the first row of the figure shows again the IRF of TBG_t. Despite a positive effect of $FDILG_t$ on TBG_t it is not found significant at 10 percent level. IRFs are found robust when China and Korea are excluded from the analysis.

The dynamic relationship between capital flows, real exchange rate appreciation and trade balances for Asian countries is quite distinct from that for Latin American countries. In the case of Model I, portfolio investments lead to a short-term appreciation in real effective exchange, the real exchange rate has a significant and long lasting effect on trade balances. But portfolio investments lead a short-term increase in trade balances, in contrast with Latin American countries. Model II variables share both common and contrasting relations to Latin American countries. FDI

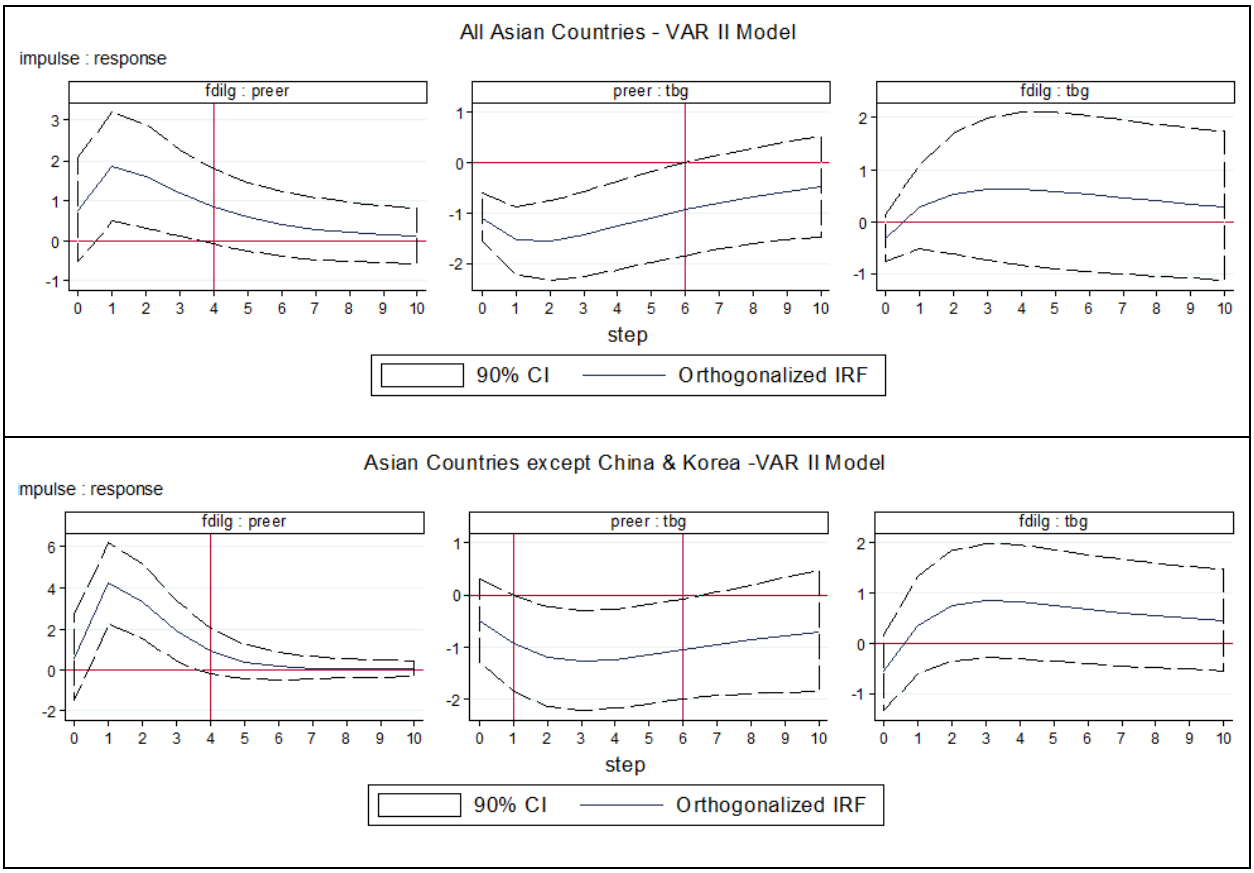

Figure 3.11: Orthogonalized Impulse Response Functions derived from VAR II model for Asian countries

flows to Asian countries lead to real exchange rate appreciation in a medium term in contrast to Latin American countries, while the negative effect of real exchange rate appreciation on trade balances remain valid for Asian countries. Lastly, the positive effect of FDI flows on trade balances is not found statistically significant at 10 percent level for Asian countries.

3.4 Summary of Results

The dynamic relationship between capital flows, real exchange rate appreciation and trade balances are analyzed through VAR analysis in this work. Firstly, the VAR results related with two different type of capital flows that are portfolio investments and foreign direct investments are illustrated again for two different set of countries, Latin American and Asian countries. Second, the structure of causal ordering between innovations related with variables in VAR system is

detected through DAG analysis on the base of Greedy Equivalence Search Algorithm. . According to DAG analysis, among Latin American countries, innovations related with portfolio investments inflows lead directly to real exchange rate appreciation and this real exchange rate appreciation leads to trade deficits. This is quite consistent with the theoretical model in previous chapters. Additionally, this result is robust to excluding two outliers Panama and Mexico from the analysis. However, foreign direct investments and real exchange rate are both found to impact trade balances. In this case, the connection between real exchange rate appreciation and foreign direct investments is not valid, but direct effect of foreign direct investments on trade balances is also found to robust when Panama and Mexico are excluded. DAG analysis results related with Asian countries also have a divergent path and both types of capital flows are exogenous to trade balances. In the first model, error terms derived from real exchange rate appreciation and portfolio investments are found to impact on trade balances. This result robust across cases. Lastly, innovations related with foreign direct investments, trade balances and real exchange rate appreciation are found independent from each other.

On the base of ordering structures detected through DAG analysis, FEVD analysis and IRF functions are derived. In the case of Latin American countries, FEVD analysis showed that both portfolio investments and real exchange rate appreciation plays important role in the determination of trade balances and results are found robust after Panama and Mexico had been excluded from the analysis. Results are conflicting when Model II for Latin American countries considered. When Latin American countries are considered as a whole, foreign direct investments are found to be quite influential in determination of trade balances and real exchange rate appreciation. However, after exclusion of Mexico and Panama, foreign direct investments do not display any effect on trade balances, but in contrast trade balances have more of an effect on foreign direct investments.

In the case of Asian countries, portfolio investments are found to have an effect on trade balances and real exchange rate appreciation, but real exchange rate is not found to have a significant effect in trade balances, in contrast to Latin America. However, after China and Korea are excluded, the role of portfolio investments in the determination of real exchange rate appreciation diminishes dramatically, but it still remains as an important factor that effects trade balances. Model II provides different results; foreign direct investments significantly effects real exchange rate appreciation it is not the same for trade balances.

IRFs show that in the case of Latin American countries, the effect of portfolio investments on trade balances and real exchange rate appreciation is found significant and robust. However, foreign direct investments have a negative effect on trade balances but that is not found robust since after Panama and Mexico are excluded. Among Asian countries, portfolio investments are found effective on real exchange rate appreciation in short run and positively affect trade balances in the very short run. The positive effect can be considered as a sign which indicates capital flows are not for financing needs of the domestic economy. Additionally, foreign direct investments effect real exchange rate appreciation positively and the relationship is both robust and significant. However, their positive effect on trade balances are not found significant across cases.

4. Conclusion

In this work, the dynamic relationship between capital flows, real exchange rate appreciation and trade balances are illustrated. Results show that in financially open countries, Latin American countries, portfolio investments and, to a certain extent, foreign direct investments affect trade balances negatively. While portfolio investments effect trade balances through real exchange rate appreciation, foreign direct investments effect trade balances directly. In financially less open countries, Asian countries, portfolio investments and foreign direct investments both

lead to real exchange rate appreciation, but the effect of portfolio investments is found to be positive and temporary. The positive effect of foreign direct investments on trade balances is found to be insignificant on the condition of negative effect of real exchange rate appreciation on trade balances. Analysis shows structural differences between Asian and Latin American countries and then different integration strategies followed in the era of globalization period lead to distinct patterns in the relation between capital flows and trade balances.

The analysis also suggests that more volatile and short term capital flows effects trade balances negatively through real exchange rate appreciation among countries that follow both capital account and trade liberalizations together

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APPENDIX I

STABILITY CONDITIONS OF SHORT-RUN & MEDIUM-RUN MODELS

1. Latin American Countries

1.2 Short-run Dynamic Model

Short-run equilibrium of Latin American economies is 3x3 dynamic model of real exchange rate ($\dot{q} = 0$), wage share ($\dot{\psi} = 0$) and foreign capital ($\dot{f} = 0$). The stability of the model can be investigated through linearization of the model around steady state values as follow;

$$\dot{\psi} = \psi(\theta_1\psi_w + \delta z + (\theta_2 - \delta\gamma)q + \theta_3 u - \varepsilon - (\delta + \theta_1)\psi) \quad (1.18a)$$

$$\dot{f} = f(\alpha_1(u - u_f) + \alpha_2(i - i_f) + \alpha_3(f_c - f)) \quad (1.20a)$$

$$\dot{q} = q(-\mu f - \delta(\psi - z + \gamma q)) \quad (1.22a)$$

$$\dot{\psi} = \dot{\psi}(\psi_{ss}, q_{ss}, f_{ss}) + \frac{\partial\dot{\psi}}{\partial\psi}(\psi_{ss}, q_{ss}, f_{ss})(\psi - \psi_{ss}) + \frac{\partial\dot{\psi}}{\partial q}(\psi_{ss}, q_{ss}, f_{ss})(q - q_{ss}) + \frac{\partial\dot{\psi}}{\partial f}(\psi_{ss}, q_{ss}, f_{ss})(f - f_{ss})$$

$$\dot{q} = \dot{q}(\psi_{ss}, q_{ss}, f_{ss}) + \frac{\partial\dot{q}}{\partial\psi}(\psi_{ss}, q_{ss}, f_{ss})(\psi - \psi_{ss}) + \frac{\partial\dot{q}}{\partial q}(\psi_{ss}, q_{ss}, f_{ss})(q - q_{ss}) + \frac{\partial\dot{q}}{\partial f}(\psi_{ss}, q_{ss}, f_{ss})(f - f_{ss})$$

$$\dot{f} = \dot{f}(\psi_{ss}, q_{ss}, f_{ss}) + \frac{\partial\dot{f}}{\partial\psi}(\psi_{ss}, q_{ss}, f_{ss})(\psi - \psi_{ss}) + \frac{\partial\dot{f}}{\partial q}(\psi_{ss}, q_{ss}, f_{ss})(q - q_{ss}) + \frac{\partial\dot{f}}{\partial f}(\psi_{ss}, q_{ss}, f_{ss})(f - f_{ss})$$

The system can be written in matrix format and features of Jacobian matrix of the system informs about the stability conditions of the model.

$$\begin{bmatrix}\dot{\psi}\\ \dot{q}\\ \dot{f}\end{bmatrix}=\begin{bmatrix}\frac{\partial\dot{\psi}}{\partial\psi} & \frac{\partial\dot{\psi}}{\partial q} & \frac{\partial\dot{\psi}}{\partial f}\\ \frac{\partial\dot{q}}{\partial\psi} & \frac{\partial\dot{q}}{\partial q} & \frac{\partial\dot{q}}{\partial f}\\ \frac{\partial\dot{f}}{\partial\psi} & \frac{\partial\dot{f}}{\partial q} & \frac{\partial\dot{f}}{\partial f}\end{bmatrix}\begin{bmatrix}(\psi-\psi_{ss})\\ (q-q_{ss})\\ (f-f_{ss})\end{bmatrix}$$

Values of the elements of Jacobian Matrix can be found as follow;

$\frac{\partial\dot{\psi}}{\partial\psi}=-\psi_{ss}(\theta_1+\delta)=J_{11}<0$ $\quad\frac{\partial\dot{\psi}}{\partial q}=\psi_{ss}(\theta_2-\delta\gamma)=J_{12}>0$ $\quad\frac{\partial\dot{\psi}}{\partial f}=0=J_{13}$

$\frac{\partial\dot{q}}{\partial\psi}=q_{ss}(-\delta)=J_{21}<0$ $\quad\frac{\partial\dot{q}}{\partial q}=q_{ss}(-\delta\gamma)=J_{22}<0$ $\quad\frac{\partial\dot{q}}{\partial f}=q_{ss}(-\mu)=J_{22}<0$

$\frac{\partial\dot{f}}{\partial\psi}=0=J_{31}$ $\quad\frac{\partial\dot{f}}{\partial q}=0=J_{32}$ $\quad\frac{\partial\dot{f}}{\partial f}=-f_{ss}\alpha_3=J_{33}<0$

The Routh-Hurwitz necessary and sufficient conditions for stability are such that:

1. Trace of the Jacobian matrix must be smaller than zero ($TrJ<0$).

$$TrJ=J_{11}+J_{22}+J_{33}<0$$

2. Determinant of the Jacobian matrix must be smaller than zero ($DetJ<0$).

$$DetJ=J_{33}(J_{22}J_{11}-J_{12}J_{21})<0$$

3. The sum of the second order principal minors of J must be greater than zero ($PmJ>0$).

$$J_{11}J_{22}-J_{21}J_{12}+J_{11}J_{33}+J_{22}J_{33}>0$$

4. Finally, it is needed to check that $-PmJ+\frac{DetJ}{TrJ}>0$. Since $TrJ<0$, the condition can be written again as $DetJ-TrJ(PmJ)>0$.

$$J_{33}(J_{22}J_{11}-J_{12}J_{21})-(J_{11}+J_{22}+J_{33})(J_{11}J_{22}-J_{21}J_{12}+J_{11}J_{33}+J_{22}J_{33})$$
$$-J_{33}(J_{11}J_{33}+J_{22}J_{33})-(J_{11}+J_{22})(J_{11}J_{22}-J_{21}J_{12}+J_{11}J_{33}+J_{22}J_{33})>0$$

Under these conditions the short-run system for Latin American countries is found stable.

1.2 Medium-run Dynamic Model:

In the medium run effective demand and distribution curve forms a 2x2 by matrix. The stability conditions can change under profit-led and wage-led demand regimes. The Jacobian matrix of the linearized system of equations (1.12) and (1.18a) is as follow;

$$\begin{bmatrix}\dot{\psi}\\ \dot{u}\end{bmatrix} = \begin{bmatrix}\frac{\partial\dot{\psi}}{\partial\psi} & \frac{\partial\dot{\psi}}{\partial u}\\ \frac{\partial\dot{u}}{\partial\psi} & \frac{\partial\dot{u}}{\partial u}\end{bmatrix}\begin{bmatrix}(\psi-\psi_{ss})\\ (u-u_{ss})\end{bmatrix}$$

$$\frac{\partial\dot{\psi}}{\partial\psi} = -\psi_{ss}(\theta_1+\delta) = J_{11} < 0 \qquad \frac{\partial\dot{\psi}}{\partial u} = \psi_{ss}\theta_3 = J_{12} > 0$$

$$\frac{\partial\dot{u}}{\partial\psi} = u_{ss}\Gamma((s_\pi - s_w)u_{ss} - g_2) \qquad \frac{\partial\dot{u}}{\partial u} = u_{ss}\Gamma(g_1 - (qa + i\Omega qf) - \{s_w\psi + s_\pi(1-\psi-\phi)\})$$

$$= J_{21} \gtrless 0 \qquad = J_{22} < 0$$

The sign of the J_{21} depends on the demand regime. In the condition of wage-led demand regime J_{21} is positive and it is negative if the demand regime is profit-led. The stability conditions of a 2x2 system are such that;

1. The trace of the Jacobian matrix must be smaller than zero ($TrJ < 0$).

   $$Tr(J) = J_{11} + J_{22} < 0$$

   Since trace is lower than zero the system is stable under both demand regimes.

2. If both $DetJ$ are $\Delta = TrJ^2 - 4DetJ$ greater than zero, system is asymptotically stable

   Profit-led Demand:

   $DetJ = J_{11}J_{22} - J_{12}J_{21} > 0 \;\; \Delta = (J_{11} - J_{22})^2 - 4J_{12}J_{21} > 0$

   Profit-led demand system is asymptotically stable.

   Wage-led Demand:

   $DetJ = J_{11}J_{22} - J_{12}J_{21} \gtrless 0 \;\; \Delta = (J_{11} - J_{22})^2 - 4J_{12}J_{21} \gtrless 0$

   Signs of both terms are indeterminate since it is quite complicated to solve. In this case,

parameter constellation that requires the asymptotical stability are assumed due to analytical concerns.

2. Asian Countries

2.1 Short-run Dynamic Model:

Short-run equilibrium of Asian economies is 2x2 dynamic model of real exchange rate ($\dot{q} = 0$), wage share ($\dot{\psi} = 0$). The Jacobian matrix of the linearized system of equations (1.22b) and (1.18b) is as follow;

$$\begin{bmatrix} \dot{\psi} \\ \dot{q} \end{bmatrix} = \begin{bmatrix} \frac{\partial \dot{\psi}}{\partial \psi} & \frac{\partial \dot{\psi}}{\partial q} \\ \frac{\partial \dot{q}}{\partial \psi} & \frac{\partial \dot{q}}{\partial q} \end{bmatrix} \begin{bmatrix} (\psi - \psi_{ss}) \\ (q - q_{ss}) \end{bmatrix}$$

$$\frac{\partial \dot{\psi}}{\partial \psi} = -\psi_{ss}(\theta_1 + \delta) = J_{11} < 0 \qquad \frac{\partial \dot{\psi}}{\partial q} = \psi_{ss}(\theta_2 - \delta_1 \gamma) = J_{12} > 0$$

$$\frac{\partial \dot{q}}{\partial \psi} = -q_{ss}\delta = J_{21} < 0 \qquad \frac{\partial \dot{q}}{\partial q} = -q_{ss}(\beta + \delta\gamma) = J_{22} < 0$$

. The stability conditions of a 2x2 system are such that;

1. The trace of the Jacobian matrix must be smaller than zero ($TrJ < 0$).

$$Tr(J) = J_{11} + J_{22} < 0$$

Since trace is lower than zero the system is stable under both demand regimes.

2. If both $DetJ$ are $\Delta = TrJ^2 - 4DetJ$ greater than zero, system is asymptotically stable

$$DetJ = J_{11}J_{22} - J_{12}J_{21} > 0 \quad \Delta = (J_{11} - J_{22})^2 - 4J_{12}J_{21} > 0$$

Short-run system of equations for Asian countries is found asymptotically stable.

2.2 Medium-run Dynamic Model

Stability conditions for medium-run dynamic equilibrium is the same of Latin American countries. The model with profit-led demand regime is found stable, the model with wage-led demand regime is found stable. However, it is not certain whether it is a saddle path or asymptotic. Like in Latin American case, it is assumed that the model is asymptotically stable.

APPENDIX II

DATA SOURCES OF CHAPTER II

Household Consumption Expenditure:
http://data.un.org/Data.aspx?d=SNAAMA&f=grID%3a102%3bcurrID%3aNCU%3bpcFlag%3a0%3bitID%3a2

Government Expenditure:
http://data.un.org/Data.aspx?d=SNAAMA&f=grID%3a102%3bcurrID%3aNCU%3bpcFlag%3a0%3bitID%3a3

Gross Fixed Capital Formation:
http://data.un.org/Data.aspx?d=SNAAMA&f=grID%3a102%3bcurrID%3aNCU%3bpcFlag%3a0%3bitID%3a5

Change in Inventories:
http://data.un.org/Data.aspx?d=SNAAMA&f=grID%3a102%3bcurrID%3aNCU%3bpcFlag%3a0%3bitID%3a6

Trade Balances
http://data.un.org/Data.aspx?d=SNAAMA&f=grID%3a102%3bcurrID%3aNCU%3bpcFlag%3a0%3bitID%3a8

Total Interest Payments Abroad
http://data.imf.org/?sk=7A51304B-6426-40C0-83DD-CA473CA1FD52&sId=1390030341854

Average interest on new external debt commitments (%)
http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators