Determinants of Current Account Balance and its Impact on Economic Growth;

A comparative study of Developed and Emerging Economies

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A thesis submitted in partial fulfillment of the requirements for the Degree of Master of Philosophy/Science in Management with specialization in Management at
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FORWARDING SHEET

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IN THE NAME OF
ALLAH, THE MOST MERCIFUL AND BENEFICIENT

Dedication

"To

My loving mother Mrs. Kalsoom Shafi, without her love, unending support, encouragement, and generosity I could not have been where I am today."

ABSTRACT

Economic performance of Developed and Emerging economies can be measured on the basis of current account balance. Developed as well as emerging economies face the problem of current account deficit. This research study focused on three Emerging counties i.e, Singapore, Pakistan, and Malaysia, and three Developed economies i.e, USA, Japan, and UK. Data was collected for imports, exports, workers' remittance, government consumption, and foreign direct investment during 1977 to 2007. The aim of the study is to investigate the different factors that influence the current account balance in Developed and Emerging economies, the affects of current account balance on economic growth of developed and emerging economies. In order to achieve our primary objectives, latest econometric techniques were used and developed the following models: Vector Autoregression model, and Vector Error Correction Model. Our findings advocate that in both groups same selected economic factors affect the current account balance. However, their level of significance, direction and magnitude are different in emerging and developed economies. Secondly, the magnitude of current account balance on the gross domestic product is high in developed economies as compared to the emerging economies.

Keywords: Current account balance, exports, imports, government consumption, foreign direct investment, workers remittances and cointegration.

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DECLARATION

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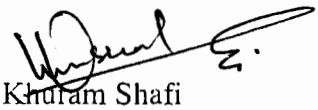

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Praise is due to Allah, Whose worth cannot be described by speakers, Whose bounties cannot be counted by calculators and Whose claim (to obedience) cannot be satisfied by those who attempt to do so. All the praises are attributed to the sole creator of the universe " the Almighty Allah", the Compassionate, the Merciful, the Source of all knowledge and wisdom, who bestowed up me health, thought, talented, sincere and cooperative teachers, friendly brothers and sisters, helping friends and power of communication and who gave me the strong courage to complete this thesis.

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INTRODUCTION

1.1 Background of Current Account Balance (CAB)

Developed and emerging economies face the problem of current account deficit from decades. Current account balance is an indicator of financial and economic performance in developed and emerging economies. Current account balance becomes one of the most important topics for policymakers in every country. Developed and emerging countries are affected by the deficit arising in the economies. This problem is becoming chronic for many decades in every economies (Baharumshah et al, 2007).

1.2 Kinds of Current Account Deficit

There are two kinds of current account deficit.

a) Consistent current account deficits.

If current account deficit increases over the period of time (years to years), it is called consistent current account deficit. It makes severe troubles for both developed and emerging countries and therefore, it dictates a policy answer.

b) Temporary or Short-term current account deficit.

If deficit is for a specified time period and will not prolong in future, it is called temporary current account balance. It causes fewer problems for an economy. It should be eliminated by re-allocation of funds to those factors of production, which have the probability of giving maximum output.

1.3 Current Account Balance as Percentage of Gross Domestic Product (GDP)

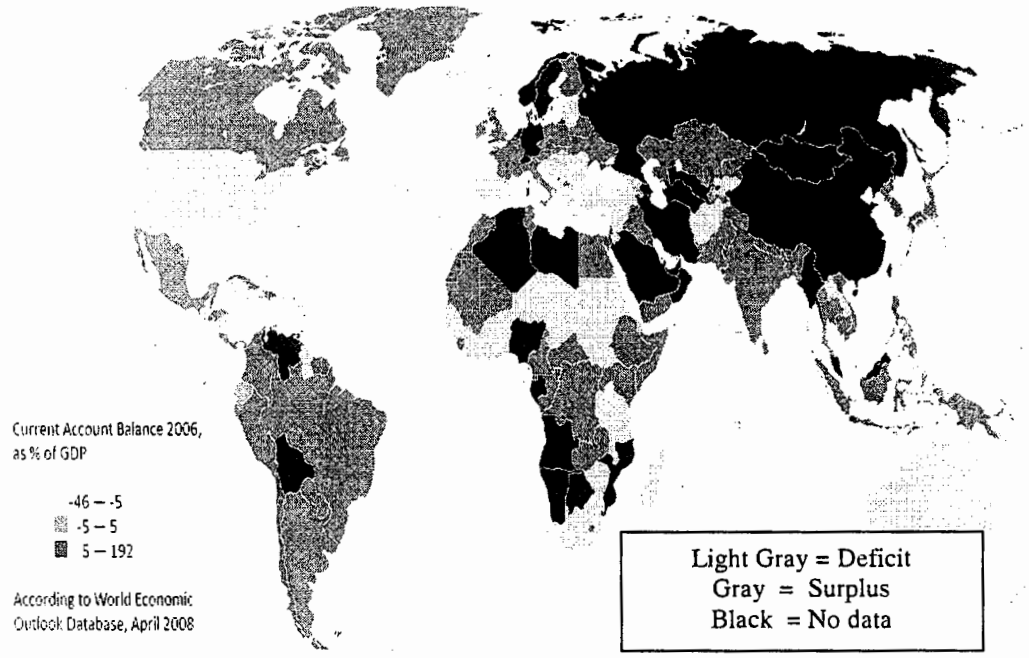

Fig -1: - Source: Central Intelligence Agency (CIA)

Current account balance percentage of GDP 2006 world picture

The above figure demonstrates current account balance as percentage of GDP of emerging and developed nation during year 2006. Developing countries are facing the problem of current account deficit and many well-developed countries have the same problem.

1.4 Significance of Research

Current account is an important barometer to both policymakers and investors, as it represents an indication of a country's economic performance. Temporary current account deficits present fewer problems as the imbalances represent the natural outcome of reallocating capital to the country and factors of production tend to

receive the highest possible returns. However, large and persistent current account deficits tend to pose more serious problems for an economy and may necessitate a policy response. Specifically, in the long run, these deficits tend to increase domestically, while simultaneously imposing an excessive burden on future generations, as the accumulation of larger debt will imply increasing interest payments, and thus lower standard of living. The deficits provide a signal of macroeconomic imbalance, calling for devaluation and tighter macroeconomic policies (Baharumshah et al, 2003).

1.5 Statement of Research Problem

Current account balance can be easily explained, collective reveneu of the government, consumers and firms is less than the expenditure of a country, then there is a current account deficit and if the revenue is more than the expenditure of, the result is current account balance surplus. If the value of the local currency declines, then export products become cheaper in the foreign market, and import of goods becomes more costly. In a condition, imports increases more as compared to the quantity of export at a specified time period, it leads to current account deficit. In another condition, imports decrease as compared to the quantity of exports in a specified period, this leads to current account surplus (Gulzar et al, 2006). There are many determinants of current account balance, which affects developed and emerging economies. Some are exports, Imports, twin deficit, government consumption, fiscal budget, workers remittance, government trade policies, and Investment etc. **Statement of research problem is to find out different determinants of CAB in developed and emerging economies, and to find out relationship of CAB with**

economic development.

1.6 Objectives of the Research

This research study will explore the magnitude and direction of different economic determinants that influence the current account balance in developed and emerging economies and effects of current account balance status on economic development of selected countries.

The objectives of this research study are:

- To identify the magnitude and direction of different economic factors with current account balance in developed and emerging economies.
- To explore the relationship between current account balance and economic growth.
- To facilitate policy makers and macro managers in designing policies to address the current situation.

1.7 Literature Review:

Developing and developed countries are affected by various factors affecting the status of current account balance in short term and long term basis (Bagnai et al, 1999), (Wu, 2000),(Blanchard, 2007). Sachs et al (1981) examined changes in the investment demand or oil prices in 1970's were the main cause of fluctuation in CAB in different countries. Results showed that oil prices had lesser effect than the investment on current account balance during 1970's. Dornbusch (1983) anticipated that possible fluctuation of exchange rates would bring changes in consumption, which had an inter-temporal effect on the current account balance. Lars (1984)

examined how current account balance affects the small oil-importing economies in the perspective of changes in oil prices and interest rates. The trade balance rises as short-term oil price decreases. If oil prices increase permanently, then trade balance is insensitive. If the world interest rate decreases, the trade balance worsens. Kazuo Ueda (1988) estimated the Japanese trade imbalances and also examined the reasons of Japan's recent current account surplus in the context of large corrections in exchange rates. Findings advocate that during 1980's the domestic savings affect the Japanese current account balance and investment balance affects the movement in Japanese current account balance. Djajić (1989) examined the short-term relationship between Government consumption and current account balance. Findings advocate that increase in the short-term government consumption affects current account balance in a short term way. He also examined how the changes in Government policy will bring changes in the CAB. Genberg and Swoboda (1992) examined the relationship of investment and saving with the current account balance. Their findings revealed that national savings and investment has association with current account and more specifically with trade and fiscal policy. Cashin and McDermott (1996) examined Australia's balance of payments performance over 1954-94. They found out that surplus in current account balance was due to increase in the national savings of Australia. Debelle and Faruqee (1996) investigated how the exchange rates affect the current account balance. They found that business cycle and terms of trade affects current account balance. Makrydakis (1999) investigated current account deficits in Greece during the period 1950 to 1995. Findings showed that optimal consumption smoothing did not occur and capital flows were compulsory. In the period of 1989-90

foreign burden was unsustainable. Bagnai and Manzocchi (1999) examined the current account reversal in developing countries in the period 1965–1994. Their findings showed that structural breakdown of the country have an important role in the fall or enhancement of the current-account balance in developing world. Mollick (1999) explored empirical relationship of macroeconomics with the CAB of Japanese economy for the period of 1885–1991. Results showed that there was more consistent relationship of the current account with fiscal policy. Anoruo and Ramchander (1998) investigated "twin deficits" of five Southeast Asian countries. Their findings showed that the fiscal deficit does not cause trade deficits, but trade deficits cause's fiscal deficits. Their findings also showed that budget and CAB has correlation. Khalid and Guan (1999) studied the twin deficit of developed and developing countries and applied co-integration techniques on annual data. Their results showed that developing countries have a relationship while no long-term connection of the twin deficits is present in developed countries with current account balance. Wu (2000) examined econometric methodology and described the policy implication regarding current account balance. His findings advocate that current account deficits in major industrial countries are maintainable and sustainable. Cooper (2001) investigated U.S. current account deficit in year 2001, which was more than 3.6 percent in 1999. Findings advocate that, USA current account deficit became large when massive infrastructure was done. Wu, et al, (2001) examined the CAB's sustainability. They studied the co-integration techniques between exports and imports. Their findings showed that there exists a strong connection between exports and imports, and has a strong relationship in G seven countries with CAB. Mann (2002) investigated that

continuing U.S. current account deficits have a negative net position in world investment of USA. Results showed that adjustment for this deficit should be more than that for short term as compare to long term. Chinn, et al, (2003) investigated that CAB has an affiliation with government budget and foreign assets in the developing countries. Financial deepening has a positive effect on CAB in emerging economies, while the openness to international trade has a negative relationship with current account balances. Mauleon and Larrion (2003) explored a foreign trade model for Malaysia and Singapore. Their evaluation showed that instability of the market for foreign exchange and implied constraint on country development turns out to be moderate factor for current account balance. Bannaga (2004) investigated that non-productive export was the major reason behind Sudan's CAB deficit. Another reason for large trade deficit is decline in the saving habit of the Sudan's economy and reduction in the private consumption. Edwards (2005) investigated the correlation between American dollar and the USA CAB. He examined the current account sustainability and its adjustment. He concluded that the future adjustment of the CAB would results in decrease in growth of USA. Kalyoncu (2005) applied co-integration techniques for period 1987 to 2002. Quarterly data finding showed that three economic variables i.e. exports, imports and Gross domestic product influenced current account balance of Turkey. Salisu (2005) estimated the impact of CAB with capital flights and also examined correlation of worker remittance with CAB. Findings revealed that there were many economics reason of affecting CAB. Blanchard, et al, (2005) investigated the probable reason of CAB deficit in USA. For this purpose they focused on USA demand of foreign exports and foreign assets and

results showed that these were the determinants of increasing CAB of USA in 1990. Freund, et al, (2005) examined the industrial countries and investigated their long and short-term adjustment of current account balance. Findings showed that if CAB deficits were large, their adjustment was not done in shorter period of time and vice versa. Those who had consistent deficits had 1) large foreign debt positions 2) experienced greater short-term capital flows, 3) extensive exchange rate adjustment. Chinn and Ito (2005) investigated the data of CAB of 117 countries for 33 years. Their findings advocate that government budget as well as foreign assets affect CAB in optimistic manner. Chinn and Ito (2005) examined factors affecting the current account related to institutional development. Results show government budget was a significant element in relation to the CAB. Aristovnik (2006) examined the factors affecting the current account deficits in Eastern Europe and former Soviet Union from 1992-2003. His expected results confirmed that (in the year 2000-2003) countries in Eastern Europe and former Soviet Union are running relatively high current account deficits. Aizenman (2006) investigated that international reserve management decreases the pace of tuning in CAB. Faster exports permit in favor of larger growth. He also explained that countries with limited financial development have benefits from commodity exporting. Blanchard (2007) examined that in developed countries discrepancies in CAB increases. Findings advocate that private saving has little role in discrepancies of CAB. Arghyrou and Chortareas (2008) examined the global current account imbalances. Very less work has been done in all European countries in face of diverging current account balances. They found that real exchange rates can offer current account determination. Tille (2008) examined the role of capital gains

and effects on the CAB. He also examined that very little attention towards the sensitivity of CAB with employment in external assets and liabilities. Moreover, information related to those factors, which affect current account balance in developed countries, is deficient, whether these factors affect emerging economies and their economic growth.

1.8 Chapter Summary

The introductory chapter contains the background information of the research work. This chapter explains the problem, its importance and research objectives. Moreover, the review of literature related to the research topic is also discussed in detail.

Chapter 2

THEORATICAL ANALYSIS & HISTORICAL BACKGROUND OF CURRENT ACCOUNT BALANCE

2.1 Definition of Current Account Balance

Madura (2003) "Current account represents a summary of the flow of funds between one specified country and all others countries due to purchase of goods or services, or the provision of income on financial assets".

2.2 Components of Current Account Balance

The current account is the broadest measure of a country's trade with the rest of the world. The balance in the current account represents the sum of net exports, net services account, net foreign income, and unilateral transfers. A nation has a current account deficit if the sum of these four account balances is negative. The size of the current account deficit reflects the amount by which a nation's gross domestic expenditure exceeds its income from all sources, domestic and foreign (gross national product, GNP).

CAB consists of four components:

i) Balance of trade

ii) Service Exports and imports

iii) Factor income

iv) Transfer payments

2.2.1 Balance of Trade

Balance of trade is the difference between the merchandise exports and merchandises imports. Merchandise exports and imports represent tangible products. A deficit in the balance of trade reflects greater value of imported goods than exported goods (Madura, 2003).

2.2.2 Service Exports and imports

The second component of the CAB is exports and imports of service. Service exports and imports such as legal, insurance and consulting services provided for customer based in other countries (Madura, 2003).

2.2.3 Factor income

The third component of the current account balance is factor income, which represents income (interest and dividend payments) received by investors on foreign investment in financial assets (Securities) (Madura, 2003).

2.2.4 Transfer payments

It represents the aid, grant, and gifts from one country to another (Madura, 2003).

2.3 Simple Model for Understanding Current Account Balance

It is easy to understand the function of national income in order to understand the current account function.

Suppose that

Y = Gross National Product (GNP): total value of all final goods and services produced by a country's factors of production.

C = Consumption: Purchases by the private sector for current wants

I = Investment: Part of current output used to increase the capital stock and increase output in the future.

G = Government purchases: Goods and services purchased by the public sector.

2.3.1 Closed Economy

In a closed economy, the relationships between these variables are given in equation (2-1).

$$Y = C + I + G \tag{2-1}$$

Rearrange this as:

$$Y - C - G = I \tag{2-2}$$

or

$$S = I \tag{2-3}$$

Where S is total national saving

So the accounting identity tells us that in a closed economy, total saving must equal investment.

2.3.2 Open Economy

In an open economy, the situation changes. Here, goods can flow across national borders.

$$Y = C + I + G + EX - IM \tag{2-4}$$

Exports less imports can be referred to as the current account:

$$CA = EX - IM \tag{2-5}$$

Where exports and imports are defined broadly, including merchandise, services and investment income/factor services.

So the open economy identity is:

$$Y = C + I + G + CA \tag{2-6}$$

or

$$Y - C - G = I + CA \tag{2-7}$$

$$S = I + CA \tag{2-8}$$

It no longer is true that saving must equal investment in an open economy. In fact this gives us a way to compute the current account, as the difference between national saving and investment.

$$CA = S - I \tag{2-9}$$

So are the fall in an economy's current account and the resulting rise in an economy's indebtedness to the rest of the world a bad thing? It is hard to say – the answer depends on what is causing it (Bergin, 2006).

Reconsider the accounting identity:

$$CA = S - I = Y - C - G - I \tag{2-10}$$

2.4 Relationship of Current Account Balance with Different Factors

The CAB in developed and emerging countries has relationship with different economic factors. Current account balance has proved a relationship which affects positively or negatively to exports, imports, workers' remittance, domestic savings, consumption level, oil prices, government trade policies, fiscal policy, investment strategies, budgetary deficits, money supply, interest rate, exchange rate, business cycle, demographics, domestic growth, incomes, relative prices and trade flows etc.

2.5 Current Account Balance of Some Developed and Emerging countries over the Past 30 years

2.5.1 Developed Countries (USA, UK, and Japan)

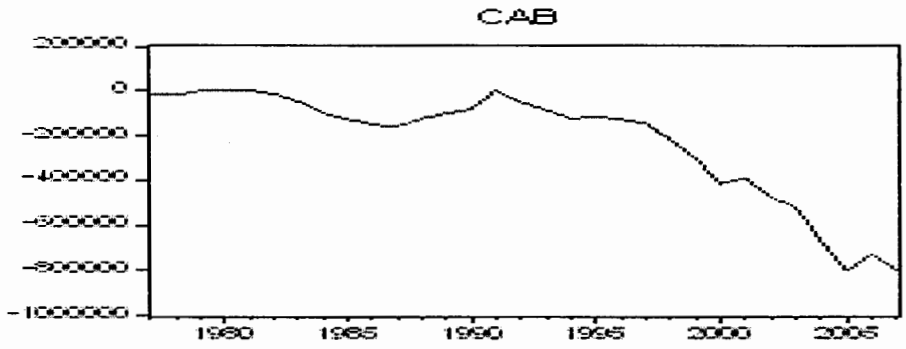

Fig 2: CAB of USA for 30 years (Million US$)

Current account balance of the USA shows that the deficit in the last 30 years is a persistent problem. Current account deficit became more and more as the years have passed.

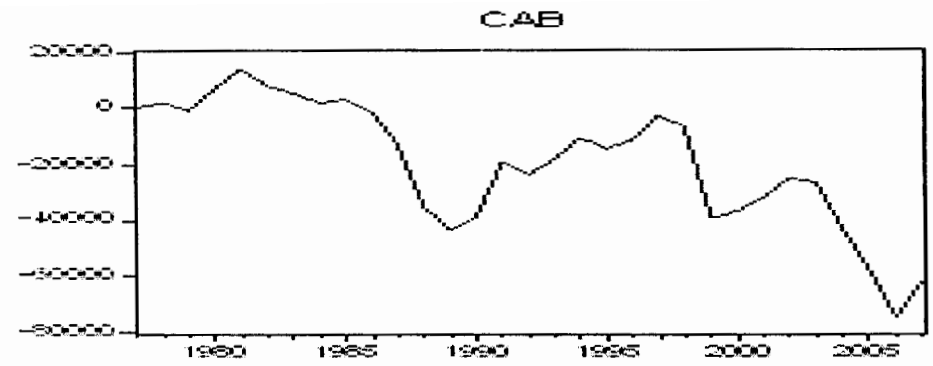

Fig 3: CAB of UK for 30 years (Million US $)

Current account balance of the UK shows that the deficit in the last 30 years is a persistent problem. Lot of fluctuations were seen in the current account balance deficit as years passed.

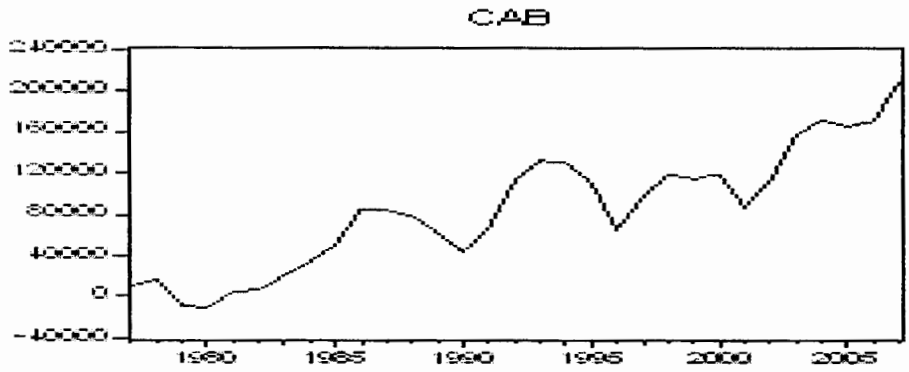

Fig 4: CAB of Japan for 30 years (Million US $)

Current account balance of Japan shows surplus in the last 30 years. Lot of fluctuations were seen in the current account balance surplus as years passed.

2.5.2 Emerging Countries (Pakistan, Malaysia and Singapore)

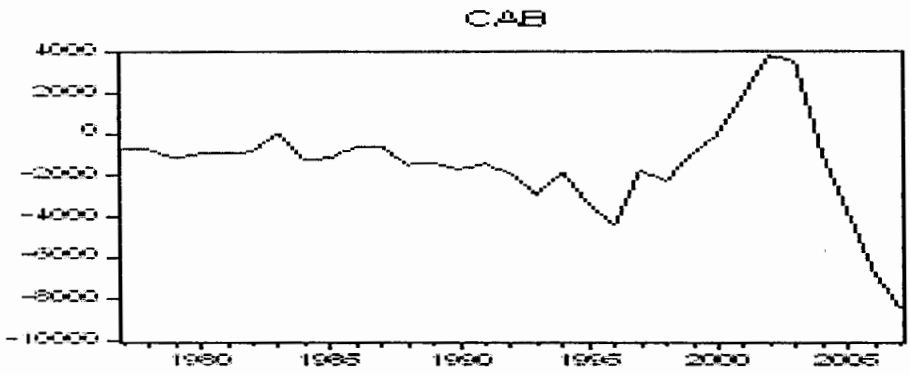

Fig 5: CAB of Pakistan for 30 years (Million US $)

Current account balance for 30 years shows deficit from year 1977 to year 2000 but in 2003 and 2004 current account balance was in surplus.

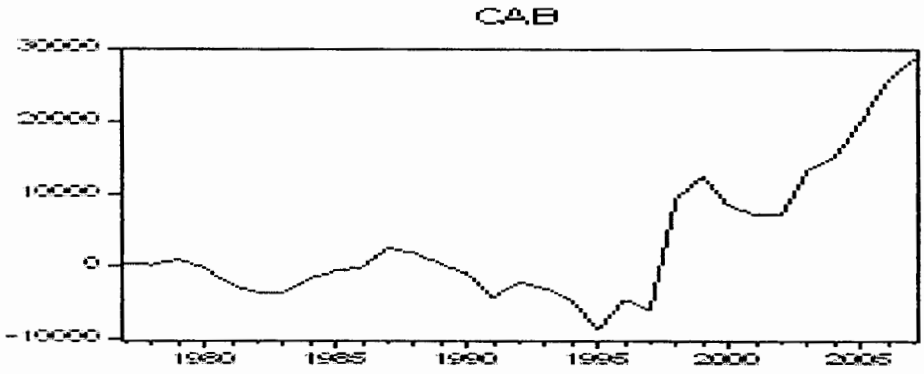

Fig 6: CAB of Malaysia for 30 years (Million US $)

Current account balance of Malaysia shows fluctuation of deficit and surplus over the period of 30 years.

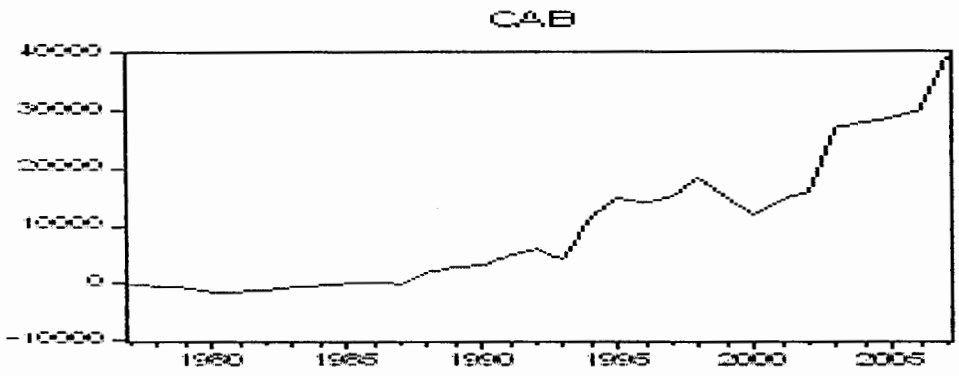

Fig 7: CAB of Singapore for 30 years (Million US $)

Current account balance of Singapore shows surplus in the last 30 years. Lot of fluctuations were seen in the current account balance surplus as years passed.

The above graph for the developed and emerging countries shows that current account balance for the FY 1997 to 2007 becames a problem. Irrespective of its negative or positive impact shows that, it is not a simple task for the countries to maintain the current account balance.

2.6 Chapter Summary

The chapter provides the theoretical analysis and historical background of current account balance. First, Defined the current account and its components and then developed a simple model for understanding the current account mechanism. Afterwards, explained the components of current account mechanism. At the end of chapter, we described the relationship of current account balance with different economic factors and presented the 30 years of current account balance of the some developed and emerging nations.

Chapter 3

SAMPLE, DATA COLLECTION, VARIABLES SELECTION, MODEL DESCRIPTION & METHODOLOGY

This chapter is based on data collection sources, selection of different economic variables along with reasons of selected variables, model description including vector auto-regression and vector error correction models.

3.1 Sample

Developed countries	Emerging Countries
1- USA	1- Singapore
2- Japan	2- Malaysia
3- UK	3- Pakistan

This research study is focused on three emerging economies Singapore, Pakistan, and Malaysia, and three developed economies USA, Japan, and UK.

3.2 Data Collection

Data were collected for imports, exports, workers' remittance, Government consumption, and foreign direct investment of the emerging and developed economies from FY 1977-2007. The annual data of exports, imports, FDI, government consumption, and workers remittances, Gross domestic product, and current account balance had been collected from IMF (International financial statistic), Asian development bank and trading economic.

3.3 Selection of Variables

3.3.1 Exports

Export of goods is one of the important elements in CAB, because it is the most vital source of foreign exchange revenue for both developed and emerging countries. If increase in export is larger than the increase in import of a country at a specified period of time then it impacts optimistically on CAB. If exports increase in a country but this increase is more than the good imported, it will affect CAB positively.

The export of goods plays an imperative role in the economic development of a country and signifies one of the most important sources of foreign exchange income. Exports not only ease the pressure on the balance of payments but also create employment opportunities. They can increase intra-industry trade, help the country to integrate in the world economy and reduce the impact of external shocks on the domestic economy (Gromling, 2005)(Gulzar, 2006).

The experiences of Asian and Latin American economies provide good examples of the importance of the export sector to economic growth and development (Fouad, 2006). Increase in the volume of exports always supports the current account balance. However, this increase must be greater than the volume of imports.

3.3.2 Imports

In both developed and emerging economies, imports of a country are more than the exports at a specified time period. This situation arises when the local producers are not able to fulfill the local demand of the country. In order to fulfill these demands, foreign products should be imported in the home country. As a result imports of the country increases and it affects current account balance in a negative way (Gromling,

2005) (Gulzar, 2006). In emerging countries the imports of the capital goods and oil are the reason for CAB deficit. In developed countries imports of the raw material is one of the main causes of the CAB deficit. Import of oil (petrol and petroleum products) is the major cause of balance of payments deficit. The trade deficit grew because of rising oil import prices (Monetary Policy of SBP, 2006). Therefore, import has a negative relationship with CAB.

3.3.3 Investment

Sachs et al (1981) demonstrates that investment has a relationship with current account balance. It has both positive and negative effect on CAB. Positive affect is that foreign direct investment in emerging countries and developed countries shows that investment is made in production sector which is more exporting. If export increases it will affect CAB optimistically. Reason for negative foreign direct investment is that it is not made in production sector, which are exporting. If export decreases this has a negative affect on the CAB.

In a very simple way we can understand the current account mechanism by examining the relationship between domestic savings and investment and foreign capital inflows. A simple accounting identity relates private savings, domestic investment, the budget deficit, and the current account deficit. Investment spending and the budget deficit are the two domestic uses of funds. Domestic savings and net capital inflow are the two sources of funds. Since the sources of funds must equal the uses of funds, the funds used to finance domestic investment and the budget deficit must come from domestic savings and net capital inflow from abroad. This relationship is shown in equation (2-10):

$$Uses = Sources \tag{2-10}$$

$$I + BD = S + NKIN, \tag{2-11}$$

Where I = domestic private investment, BD = budget deficit, S = domestic private savings, and $NKIN$ = net capital inflow.

If the domestic uses of funds exceed the domestic sources of funds, the excess must be borrowed from abroad and resulting in a net capital inflow. This relationship can be seen in equation (2-12):

$$NKIN = I + BD - S. \tag{2-12}$$

Furthermore, since the current account deficit (CAD) equals net capital inflow, equation (2-12) can be rewritten as:

$$CAD = I + BD - S \tag{2-13}$$

Equations (2-12) and (2-13) show that a country with good investment prospects, a large budget deficit, or a low propensity to save tends to have a net capital inflow and a current account deficit. In other words, policies that promote investment spending, discourage private saving, or lead to a large budget deficit result in a current account deficit (Craig, 1995).

3.3.4 Government Consumption

If, government consumption increases then it decreases in CAB and if lower the government consumption then higher the CAB. So, government consumption is one of the important variables, which affects the current account balance. If government consumption is made on the productive sectors of the economy it will increase the exports of the country then its impact is positive on the current account balance. If government consumption is made on the non-productive sectors of the economy it will not increase the exports of the country then its impact is negative on the current account balance.

Short term and long term relationship exists between the government consumption and current account balance. Changes in the government consumption policy will bring changes in the CAB. Marginal utility of private spending and the supply of public goods in the economy have an effect on current account balance (Djajić, 1989).

3.3.5 Workers' Remittance

Workers' remittances influence the CAB in a positive way according to Salisu (2005). In emerging and developed countries its impact on CAB is optimistic. Increase in amount of workers' remittance means larger the CAB and vice versa. In the countries where the jobs opportunities are more and skilled workers are highly paid this amount is less. So, impact of CAB is less optimistic and vice versa. Finally, it is hypothesized that workers' remittance has a positive relationship with current account balance.

3.4 Model Description and Methodology

3.4.1 Description of the Model-1

From the variables, it can be written as;

$$CAB\ f\ (Exp,\ Imp,\ W.r,\ G.C,\ FDI,)\ ----\ (Eq\text{-}1)$$

Where as,

f = function

Exp = Exports

Imp = Imports

G.C = Government consumption

W.r = workers' remittances

FDI = Foreign Direct investment

By transforming the above relation into equation 1:

$$CAB = \beta_0 + \beta_{1\ (Exp)} - \beta_{2\ (Imp)} + \beta_{3\ (W.r)} + \beta_{4\ (FDI)} - \beta_{5\ (G.C)} + \varepsilon \quad ----\ (Eq\text{-}2)$$

3.4.2 Description of the Model-2

For testing the relationship of CAB and economic development following relationship will be tested.

$$GDP = \beta_0 + \beta_{1\ (CAB)} + \varepsilon \quad \text{..... } (Equation\text{-}3)$$

Where as,

GDP = Gross domestic Product

ε = Error term

3.4.3 Methodology

In this research study, two different econometric procedures employed. Co-integration analysis observed the time series behavior of the data. Long terms relation will be examined by using Vector Auto-regression, and using Vector error correction modeling approach will capture short-terms relation.

3.4.3.1 Vector Auto-regression (VAR) Model

The vector auto-regression (VAR) is commonly used for forecasting systems of interrelated time series and for analyzing the dynamic impact of random disturbances on the system of variables. The VAR approach sidesteps the need for structural modeling by treating every endogenous variable in the system as a function of the lagged values of all of the endogenous variables in the system (E.views, 2005).

The mathematical representation of a VAR is:

$$z_t = \psi_1 z_{t-1} + ...\psi_p z_{t-p} + \mathrm{K}x_t + \varepsilon_t \qquad (3\text{-}7)$$

Where z_t is a k - vector of non-stationary I (I) variables, x_t is a d vector of deterministic variable and ε_t is a vector of innovations.

3.4.3.2 Vector Error Correction (VEC) Model

The error correction mechanism first used by Sargan in 1984 and later popularized by EG corrects for non-equilibriums. Vector Error Correction (VEC) model is a restricted VAR designed applicable only for a time series that is non-stationary. The VEC has a co-integration relation built into the specification so that it restricts the long-run behavior of the endogenous variables. The co-integration term is known as the error correction term since the deviation from long-run equilibrium is corrected

gradually through a series of partial short-run adjustments. Banerjee et al (1993) view the error correction mechanism as a useful way of estimating dynamic regression models that incorporate both the long-term focus on levels found in co-integration analysis and the short-term focus on changes found in first-differenced regression models, such as those used by Cantor and Land. However, it should be noted that short-term changes in the time series are defined as departures from equilibrium. Regardless of the statistical accounting for these changes in the error correction factor, the dependent variable remains the level of the time series, and the main hypothesis is still one of looking at stability in long-term relationship and not one of looking at changes in the dependent variable.

To take the simplest possible example, consider a two variable system with one co-integrating equation and no lagged difference terms. The co-integrating equation is:

$$\eta_{2,t} = \beta \eta_{1,t} \tag{3-11}$$

The corresponding VEC model is:

$$\begin{aligned} \Delta\eta_{1,t} &= \alpha_1(\eta_{2,t-1} - \beta\eta_{1,t-1}) + \varepsilon_{1,t} \\ \Delta\eta_{2,t} &= \alpha_2(\eta_{2,t-1} - \beta\eta_{1,t-1}) + \varepsilon_{2,t} \end{aligned} \tag{3-12}$$

In this simple model, the only right-hand side variable is the error correction term. In long run equilibrium, this term is zero. However, if η_1 and η_2 deviate from the long run equilibrium, the error correction term will be nonzero and each variable adjusts to partially restore the equilibrium relation. The coefficient α_i measures the speed of adjustment of the i-the endogenous variable towards the equilibrium (Banerjee et al, 1993).

3.5 Chapter Summary

Chapter is based on the data collection, variable selection, and model description. This chapter describes the sources of data collection, period covered, reasoning for selecting the specific period, selection of variable, and reasons for selecting these economic variables. The model description section describes the Vector Auto-regression (VARs) and Vectors Error Correction (VEC) model.

Chapter 4

EMPIRICAL RESULTS OF DEVELOPED AND EMERGING COUNTRIES

This chapter contains the empirical results of the tests conducted in this research work. The latest econometric techniques: vector auto-regression (VAR) model, and vector error correction (VEC) model were used. The results of study are given respectively.

4.1 United States of America (USA)

4.1.1 Test of Unit Roots Hypothesis (USA)

The Augmented Dickey-Fuller (ADF) was applied to check the stationary of the data on the Levels and the First difference (Δ) of current account balance, export, import, foreign direct investment, government consumptions, Workers' remittance and gross domestic product for USA from FY 1977 to 2007, because it gives a picture for accuracy of the results. Three kinds of conditions are given below:

1) Have Intercept and trend.

2) Have Intercept and trend none.

3) Have Trend and intercept not.

The question arises which condition should be suitable for the research study. One empirical approach suggests the visual observation of the time series plot of the data Zhang (2003). If the graph shows such characteristics as changing variables over time (increase and decrease) and no obvious step trend, then the time series is best represented by the second situation. In this regard time series graphs have been

plotted to show all the variables in our model. Figure-8 demonstrates time series graph of current account balance as well as export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic product vividly.

4.1.1.1Graphical Representation (USA)

After observing the graphs of all these variables for this research study, it has been analyzed that government consumption and gross domestic products have trend in the time series data on the Level. On the other hand, current account balance, foreign direct investment, export, import, and workers' remittance don't have any trend in the data at the Levels. For this purpose annual data has been taken from 1977 to 2007 for current account balance, export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic product.

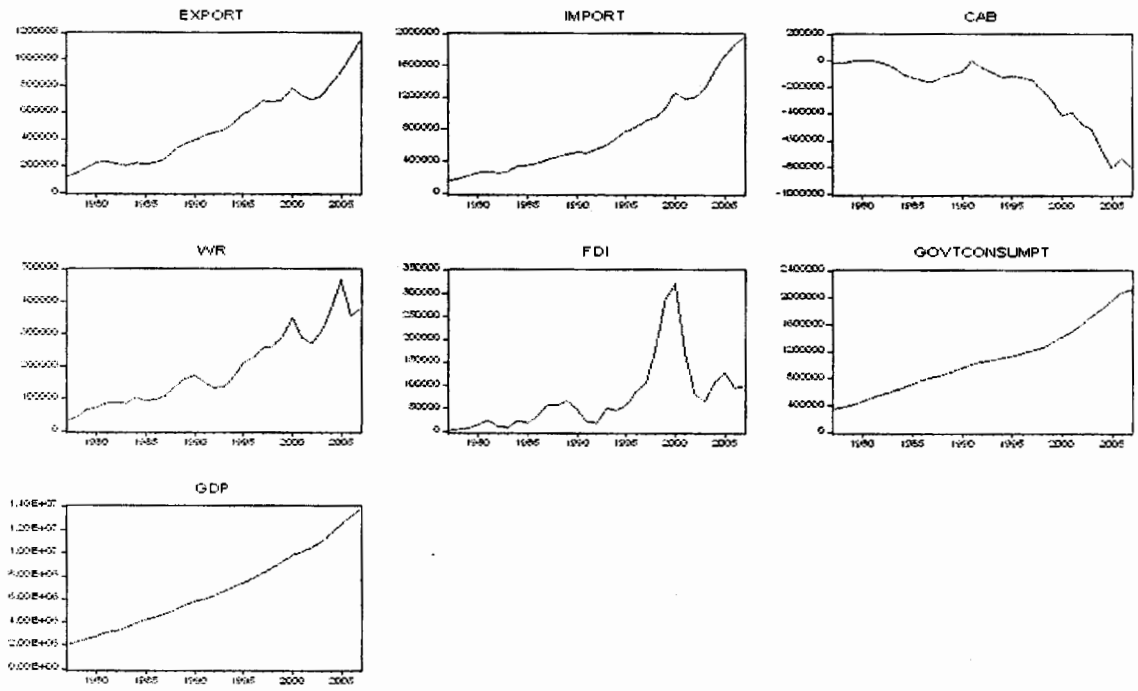

Fig. 8: USA: Time series graphs of different variables on the Levels

4.1.1.2 Results of the Unit Root Hypothesis (USA)

The result of the test indicates that all the variables like current account balance, export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic products have a unit root in their levels and are stationary in their first differences. The test rejects the null hypothesis that there is a unit root in the first difference of every variable.

Table -1 Test of the unit root hypothesis (USA)

Variables	Types of test (c, t , n)	ADF test Statistics	D-W Statistics	Probability
Export	C 0 1	2.314976	1.209889	0.9999
Δ Export	C 0 1	-1.601749***	2.036574	0.100
Import	C 0 1	3.496566	1.831059	1.0000
Δ Import	C 0 1	-3.372281**	1.932023	0.0205
CAB	C 0 1	1.617072	1.980057	0.9992
Δ CAB	C 0 1	-4.455142*	1.998848	0.0015
FDI	C 0 1	-1.605233	1.916982	0.4668
Δ FDI	C 0 1	-5.044057*	1.988506	0.0003
Wr	C 0 1	2.566940	2.363780	0.9999
Δ Wr	C 0 1	-3.000579**	1.757887	0.0491
Govt. Comp.	C 0 1	0.882845	2.440429	0.9933
Δ Govt. Comp.	C 0 1	-4.294356*	1.527076	0.0031
GDP	C 0 1	1.839527	2.287259	1.0000
Δ GDP	C 0 1	-3.897001**	2.058461	0.0258

Note:*Null hypothesis does not accept at 1% level.

** Null hypothesis does not accept at 5% level.

*** Null hypothesis does not accept at 10 % level.

Probability = P-values [MacKinnon (1996)]

Δ = First differential

The current account balance, foreign direct investment, government consumptions are at 1 % significant Level while workers' remittance, gross domestic product and imports are at 5 % significant Level. The Durbin-Watson statistics supports the value of all these variables.

4.1.2 Johansen Co-integration Test (USA)

In this section, Johansen co-integration test is applied. Co-integration test is a long-term equilibrium statistics of non-stationary economic variables. The long-term equilibrium relation exists in non-stationary economic variables, which is called as a co-integration relation.

4.1.2.1 Statistics of VAR Lag Order Selection (USA)

All the series of the six variables current account balance, export, import, foreign direct investment, government consumptions, and workers' remittance are integrated in order one [*I* (1)].

Table -2: Statistics of VAR Lag Order Selection (USA)

Lag	FPE	AIC	SC	HQ
0	5.58e+57	149.9928	150.2783	150.0801
1	6.34e+52	138.5442	140.5425	139.1551
2	7.35e+51	135.9917	139.7029	137.1262
3	1.15e+50*	130.5225*	135.9465*	132.1807*

* indicates lag order selected by the criterion

FPE	Final Prediction Error
AIC	Akaike Information Criterion
SC	Schwarz Information Criterion
HQ	Hannan-Quinn Information Criterion

Next step was to determine whether any combinations of the variables have a co-integrated relationship. Before applying the co-integration tests, firstly, specify the relevant order of lags (p) of the VAR model. For this purpose, Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and Hannan-Quinn Information Criterion (HQ) were used. Table 2 shows the results of the optimal Lag selection. According to the results of these tests, Lag 3 was selected in the VAR model.

4.1.2.2 VAR Co-integration Test Statistics (USA)

The Trace test indicates four co-integration equations at 5 % Level and it also indicates three co-integration equation at 1% level. Max-Eigenvalue test indicates two co-integration equation at 5% and 1% Levels. These statistics indicates that seven null hypothesis are rejected. Therefore, annual data from 1977 to 2007 impeccably appears to support the intention that in the USA, there exists a long-term relationship between the current account balance and export, import, foreign direct investment, government consumptions, workers' remittance.

Table -3 VAR Co-integration test Statistics (USA)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistics	5 % Critical Value	1 % Critical Value
r = 0 **	0.822232	150.8696	94.15	103.18
r ≤ 1**	0.768790	100.7787	68.52	76.07
r ≤2**	0.587088	58.31018	47.21	54.46
r ≤3*	0.468364	32.65911	29.68	35.65
r ≤4	0.309680	14.33702	15.41	20.04
r ≤5	0.116426	3.589613	3.76	6.65

Hypothesized No. of CE(s)	Eigenvalue	Max Eigenvalue	5 % Critical Value	1 % Critical Value
r = 0 **	0.822232	50.09097	39.37	45.10
r ≤ 1 **	0.768790	42.46849	33.46	38.77
r ≤2	0.587088	25.65107	27.07	32.24
r ≤3	0.468364	18.32209	20.97	25.52
r ≤4	0.309680	10.74741	14.07	18.63
r ≤5	0.116426	3.589613	3.76	6.65

*(**) Indicates rejection of the hypothesis at 5% (1%) Level

4.1.2.3 Multiple Regression (USA)

Estimation of long-run co-integrating vector is given in the table 4.

Normalized Co integrating Coefficients

CAB	EXPORT	IMPORT	FDI	WR	G.C	C
1.00	1.5527	-1.53148	0.38678	0.56567	-0.049259	-82774
	(0.109)	(0.09290)	(0.09737)	(0.30238)	(0.04629)	
	[-14.18]	[16.482]	[-3.9722]	[-1.8707]	[1.0641]	

Adjustment Coefficients

D(CAB)	D(EXPORT)	D(IMPORT)	D(FDI)	D(WR)	D(G.C)
-0.469045	0.773929	1.238742	0.760317	0.464423	-0.012217
(0.27421)	(0.12955)	(0.19055)	(0.16530)	(0.19983)	(0.07653)
[-1.71052]	[5.97416]	[6.50087]	[4.59966]	[2.32409]	[-0.15964]

Table -4: Estimation of Normalized Co-integration and Adjustment Coefficient (USA)

Vector Error Correction Model -1 (USA)

By putting the data of the table 4 in equation form. The following co-integration equation shows the relationship of the variables.

$CAB = 82774 + 1.553Exp - 1.538Imp + 0.388FDI + 0.567\text{Wr} - 0.049G.C.$ ----- *(Eq. 3)*

1 % increases in the exports causes 1.553 % increase in the current account balance while 1 % boost in the import pursues 1.538 diminish in the current account balance of USA. Furthermore, 1 % increase in the government consumption causes 0.049 decreases in the current account balance of USA. However, the foreign direct investment and workers' remittance in the estimated equation is positive which means 1 % increase in the foreign direct investment that will increase the Current account balance by 0.388 % and 0.567 % in workers' remittance.

4.1.3 Multiple Regression (USA)

Estimation of long-run co-integrating vector is given in the table-5 for model-2.

Normalized Co integrating Coefficients:

GDP(-1)	CAB(-1)	C
1.000000	4.766031	-7808589
	(5.63566)	
	[0.84569]	

Adjustment Coefficients:

D(GDP)	D(CAB)
0.024894	-0.007840
(0.00765)	(0.00439)
[3.25251]	[-1.78444]

Table -5: Estimation of Co-integration and Adjustment Coefficient (USA)

Vector Error Correction Model -2 of USA

By putting the data of the table 5 in equation form shows the relationship of Current account balance with gross domestic product.

$GDP = 7808589 + 4.766031CAB$ ---------- *(Eq.4)*

Above equation describes that 1 % increase in the Current account balance causes 4.8 % increase in the gross domestic product of USA.

4.2 Japan

4.2.1 Testing of Unit Roots Hypothesis (Japan)

Augmented Dickey-Fuller (ADF) was used to find out the stationary of the data on the Levels and the First difference (Δ) of current account balance, export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic product for Japan from FY 1977 to 2007, as it gives accurate results. By using the conditions of having Intercept and trend, having Intercept and non-trend and having trend and no intercept. To show these condition time series graph has been plotted for current account balance, export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic product for Japan from FY 1977 to 2007. Figure 9 demonstrates time series graph of all the seven selected variables.

4.2.1.1 Graphical Representation of Japan

By observing the graphs of all the variables, it is concluded that export, import, government consumption and gross domestic product have trend in the time series data on the Level. On the other hand, current account balance, foreign direct

investment, and workers' remittance don't have any trend in the data at the Levels.

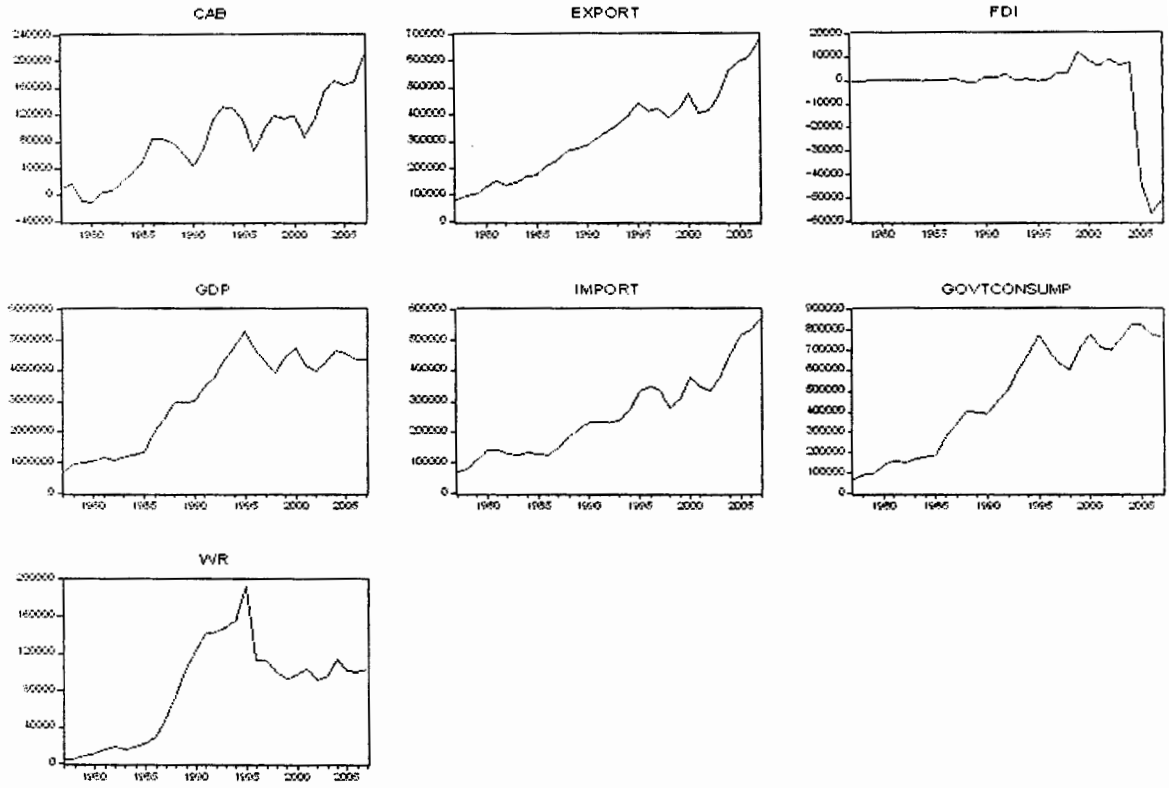

Fig.9 Japan: Time series graphs of different variables on the levels (Amount in Million USA$)

4. 2.1. 2 Results of the Unit Root Hypothesis (Japan)

It has been indicated by the result of the test that all the variables current account balance, export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic product have a unit root in their Levels and are stationary in their first differences. The test rejected the null hypothesis that there is a unit root in the first difference of all variable like current account balance, export, import, government consumptions, and workers' remittance and gross domestic

product are at 1 % Level significantly while foreign direct investment is at 5 % significant Level. The Durbin-Watson statistics also immaculately verifies the value of current account balance with export, import, foreign direct investment, government consumptions, gross domestic product, and workers' remittance.

Table -6: Unit root test of Japan

Variables	Types of test (c, t , n)	ADF test Statistics	D-W Statistics	Probability
Export	C 0 1	0.643072	2.026158	0.9886
Δ Export	C 0 1	-5.063012 *	1.938362	0.0003
Import	C 0 1	1.827441	1.977426	0.9996
Δ Import	C 0 1	-4.992569 *	1.788249	0.0004
CAB	C 0 1	-0.274642	1.537827	0.9175
Δ CAB	C 0 1	2.123420 *	-4.875024	0.0005
FDI	C 0 1	-2.313140	1.802074	0.1761
Δ FDI	C 0 1	-3.038343 **	2.111294	0.0455
Wr	C 0 1	-1.521968	2.085717	0.5090
Δ Wr	C 0 1	-5.553886 *	1.979635	0.0001
Govt. Comp.	C 0 1	-1.168058	2.220397	0.6737
Δ Govt. Comp.	C 0 1	-4.815513 *	2.208780	0.0006
GDP	C 0 1	-1.476288	1.418486	0.5316
Δ GDP	C 0 1	-3.831729 *	1.813553	0.0069

Note:

*Null hypothesis does not accept at 1% level.

** Null hypothesis does not accept at 5% level.

Probability = P-values [MacKinnon (1996)]

Δ = First differential

4.2.2 Johansen Co-integration Test of Japan

Co-integration test is applied on the data of Japan to find out the long–term relationship of current account balance with export, import, foreign direct investment, government consumptions, and workers' remittance.

4.2.2.1 Statistics of VAR Lag Order Selection of Japan

All the series of the six variables current account balance, export, import, foreign direct investment, government consumptions, and workers' remittance are integrated in order one [*I* (1)]. According to the results of these tests, Lag 3 was selected in the VAR model.

Table -7: Statistics for VAR Lag Order Selection of Japan

Lag	FPE	AIC	SC	HQ
0	4.71e+53	140.6146	140.9000	140.7018
1	6.92e+50	134.0258	136.0241	134.6367
2	1.74e+50	132.2459	135.9570	133.3804
3	1.46e+49*	128.4552*	133.8792*	130.1134*

* indicates lag order selected by the criterion

FPE	Final Prediction Error
AIC	Akaike Information Criterion
SC	Schwarz Information Criterion
HQ	Hannan-Quinn Information Criterion

4.2.2.2 VAR Co-integration Test Statistics (Japan)

Trace test indicates two co-integration equations at 5 % Level and also shows one co-integration equation at 1 % Level. Max-Eigenvalue test shows that there is one co-

integrating equation at both 5 % and 1 % level. These statistics rejects the four null hypotheses. This means that there are two co-integration equation r = 2 among the five variables at the significance level of 5 %. Therefore, our annual data from 1977 to 2007 perfectly supports that in Japan there exists a long-term relationship between the current account balance, export, import, foreign direct investment, government consumptions, and workers' remittance.

Table -8 VAR Co-integration test Statistics of Japan

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
R = 0 **	0.904139	143.5096	94.15	103.18
R ≤ 1 *	0.679033	75.50889	68.52	76.07
R ≤2	0.517023	42.55278	47.21	54.46
R ≤3	0.437456	21.44696	29.68	35.65
R ≤4	0.109256	4.763665	15.41	20.04
R ≤5	0.047405	1.408410	3.76	6.65

Hypothesized No. of CE(s)	Eigenvalue	Max Eigenvalue	5 Percent Critical Value	1 Percent Critical Value
r = 0 **	0.904139	68.00074	39.37	45.10
r ≤ 1	0.679033	32.95611	33.46	38.77
r ≤2	0.517023	21.10581	27.07	32.24
r ≤3	0.437456	16.68330	20.97	25.52
r ≤4	0.109256	3.355255	14.07	18.63
r ≤5	0.047405	1.408410	3.76	6.65

*(**) Indicates rejection of the hypothesis at 5%(1%)level

4.2.2.3 Multiple Regression (Japan)

Estimation of long-term co-integrating vector of Japan is given in the table 9.

Normalized Co integrating Coefficients:

CAB	EXPORT	IMPORT	FDI	WR	GOVTCONSMP	C
1.00	0.743439	-0.887749	-1.227351	0.212409	-0.167693	-4910
	(0.07132)	(0.05208)	(0.12682)	(0.02803)	(0.03126)	
	[-10.4244]	[17.0452]	[9.67795]	[7.57921]	[-5.36454]	

Adjustment Coefficients:

D(CAB)	D(EXPORT)	D(IMPORT)	D(FDI)	D(WR)	D(G.C)
0.295539	1.957443	1.920598	-0.636797	0.034661	1.868289
(0.39223)	(0.57060)	(0.45175)	(0.11531)	(0.45283)	(0.77243)
[0.75349]	[3.43049]	[4.25145]	[-5.52225]	[0.07654]	[2.41871]

Table -9: Estimation of Normalized Co-integration and Adjustment Coefficient of Japan

Vector Error Correction Model (Japan)

By putting the data of the table 9 in equation that shows relationship of the variable as:

$CAB = 4910 + 0.743Exp - 0.887Imp - 1.22FDI + 0.212Wr + 0.167G.C.$--------*(Eq.5)*

Above mentioned equation shows that 1 % boost in the export causes 0.743% boost in current account balance of Japan. And 1 % increase of imports in Japan leads to 0.887 decrease in current account balance. Furthermore, 1 % increase in the government consumption causes 0.167 increases in the current account balance. Foreign direct investment in the estimated equation is negative which presents 1 % increase of foreign direct investment leads towards decrease of current account

balance by 1.22 % while increase in workers' remittance will increase the current account balance by 0.212 % of Japan.

4.2.3 Multiple Regression (Japan)

Estimation of long-term co-integrating vector of Japan is given in the table10.

Normalized Co integrating Coefficients

GDP(-1)	CAB(-1)	C
1.000000	20.10048	1522354
	(7.37353)	
	[2.72603]	

Adjustment Coefficient

D(GDP)	D(CAB)
0.142495	0.001775
(0.08389)	(0.00535)
[1.69857]	[0.33146]
Standard errors in parentheses & t-statistics in brackets	

Table -10: Estimation of Co-integration and Adjustment Coefficient (Japan)

Vector Error Correction Model (Japan)

The data of the table 5 in equation form shows the relationship of the variable as:

$GDP = 1522354 + 20.10048\ CAB$ ---------- *(Eq.6)*

Above equation describes that 1 % increase in the current account balance causes 20.1 % increase in the gross domestic product of Japan.

4.3 United Kingdom (UK)

4.3.1 Testing of Unit Roots Hypothesis (UK)

With the application of Augmented Dickey-Fuller unit root hypothesis which had tested the stationary of the data on the Levels and the First difference of current account balance, export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic product for United Kingdom from FY 1977 to 2007. The previous three kinds of conditions (as discussed in section 4.1.1, 4.2.1) that were used on the data of USA and Japan to check the stationary have been similarly used on the data of UK. Figure-10 demonstrates the time series graph of current account balance, export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic product for UK.

4.3.1.1 Graphical Representation (UK)

It is examined with the observation of the graph of all the variables in the model it is claimed that export, import, government consumption, workers' remittance and gross domestic products have a trend in the time series data on the Level. On the other hand, current account balance and foreign direct investment don't have any trend in the data at the Level.

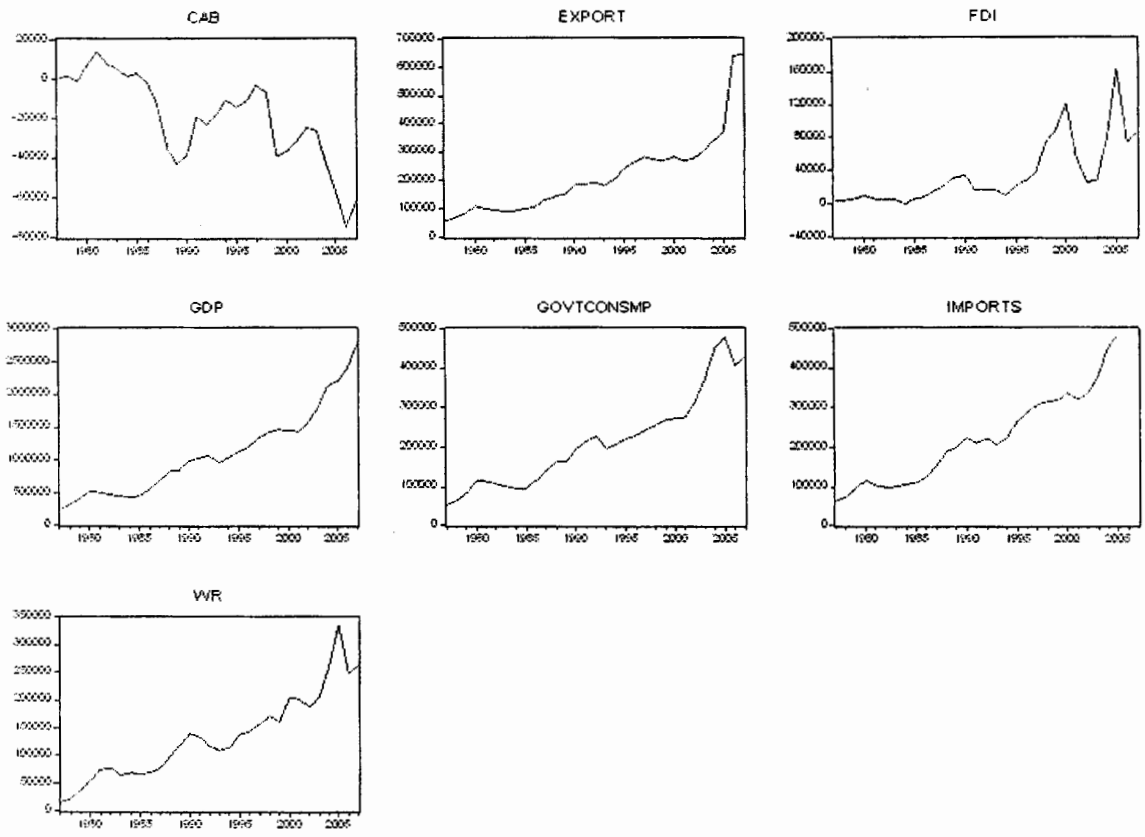

Fig. 10: UK: Time series graphs of different variables on the levels (Million USA$)

4.3.1.2 Results of Unit Root Hypothesis for UK

It is examined by the test indicates that all the variables like current account balance, export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic product have a unit root in their Levels and found stationary in their first differences as indicated in table 11. The test rejected the null hypothesis that there is a unit root in the first difference in current account balance, export, government consumptions, and workers' remittance at 1 % significant level, while foreign direct investment and imports are at 5 % significant level and gross domestic product is at 10 % significant level. The Durbin-Watson statistics value of

current account balance, export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic product also support the graph.

Table- 11: Results of the Unit root test (UK)

Variables	Types of test (c, t , n)	ADF test Statistics	D-W Statistics	Probability
Export	C 0 1	1.495508	2.286801	0.9989
Δ Export	C 0 1	-4.930826*	2.000149	0.0004
Import	C 0 1	1.669904	1.467808	0.9993
Δ Import	C 0 1	-3.333258**	1.956801	0.0232
CAB	C 0 1	-1.559614	1.867686	0.4898
Δ CAB	C 0 1	-4.147995*	1.804288	0.0032
FDI	C 0 1	0.789282	2.229071	0.9916
Δ FDI	C 0 1	-3.628928**	2.001190	0.0128
W.r	C 0 1	2.807101	1.662484	1.0000
ΔW.r	C 0 1	-5.098036*	2.122792	0.0003
Govt. Comp.	C 0 1	0.000529	1.587215	0.9514
Δ Govt. Comp.	C 0 1	-4.196785*	1.975300	0.0029
GDP	C 0 1	1.195034	1.469698	0.9999
Δ GDP	C 0 1	-3.186634***	1.822167	0.1000

Note:

*Null hypothesis does not accept at 1% level.

** Null hypothesis does not accept at 5% level.

*** Null hypothesis does not accept at 10 % level.

Probability = P-values [MacKinnon (1996)]

Δ = First differential

4.3.2 Johansen Co-integration Test (UK)

The long–term relationship of current account balance of United kingdom with export, import, foreign direct investment, government consumptions, and workers' remittance is found with the application of co-integration test.

4.3.2.1 Statistics for VAR Lag Order Selection (UK)

It is analyzed that all the series of the six variables (current account balance, export, import, foreign direct investment, government consumptions, and workers' remittance) are integrated in order one. Table 12 shows the results of the most favorable Lag selection. According to the results of these tests, Lag 3 was selected in the VAR model.

Table -12: Statistics for VAR Lag Order Selection (UK)

Lag	FPE	AIC	SC	HQ
0	4.44e+51	135.9488	136.2391	136.0324
1	5.42e+48	129.1601	131.1924	129.7453
2	6.50e+47	126.5294	130.3037	127.6163
3	1.32e+47*	123.1323*	128.6486*	124.7208*

* Indicates lag order selected by the criterion

FPE	Final Prediction Error
AIC	Akaike Information Criterion
SC	Schwarz Information Criterion
HQ	Hannan-Quinn Information Criterion

4.3.2.2 VAR Co-integration Test Statistic (UK)

Trace test indicates two co-integration equations at 5 % and 1% Level. Max-Eigenvalue test indicates two co-integration equations at 5 % level and it also indicates one co-integration equation at 1% level. These statistics indicates that four null hypothesis are rejected. This means that there are two co-integration equation r = 2 among the five variables at the significant level of 5 % and 1 %. Therefore, annual data for last 30 years from 1977 to 2007 perfectly supports the intention that in United Kingdom long-run relationship exists between the current account balance with export, import, foreign direct investment, government consumptions, and workers' remittance.

Table -13 VAR Co-integration tests Statistics (UK)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistics	5 Percent Critical Value	1 Percent Critical Value
r = 0 **	0.917412	145.5007	94.15	103.18
r ≤ 1 **	0.722152	78.16578	68.52	76.07
r ≤2	0.597529	43.58743	47.21	54.46
r ≤3	0.304441	19.01386	29.68	35.65
r ≤4	0.288771	9.211794	15.41	20.04
r ≤5	0.000416	0.011234	3.76	6.65

Hypothesized No. of CE(s)	Eigenvalue	Max Eigenvalue	5 Percent Critical Value	1 Percent Critical Value
r = 0 **	0.917412	67.33496	39.37	45.10
r ≤ 1*	0.722152	34.57835	33.46	38.77
r ≤2	0.597529	24.57357	27.07	32.24
r ≤3	0.304441	9.802065	20.97	25.52
r ≤4	0.288771	9.200560	14.07	18.63
r ≤5	0.000416	0.011234	3.76	6.65

*(**) Indicates rejection of the hypothesis at 5%(1%)level

4.3.2.3 Multiple Regression (UK)

Estimation of long-term co-integrating vector of United Kingdom is given in the table 14.

Normalized Co integrating Coefficients

CAB	EXPORT	IMPORT	FDI	WR	GOVTCOUMP	C
1.0	1.6384	-2.009	0.3784	0.1810	0.3675	-12582
	(0.07341)	(0.09230)	(0.04930)	(0.05837)	(0.04287)	
	[-22.3171]	[21.7693]	[-7.677]	[-3.10213]	[-8.57338]	

Adjustment Coefficient

D(CAB)	D(EXPORT)	D(IMPORT)	D(FDI)	D(WR)	D(GOVTCOMP)
-0.197065	1.084211	-1.486316	1.587220	1.134070	1.658275
(0.25473)	(0.33080)	(0.38701)	(0.46425)	(0.32259)	(0.35771)
[-0.77363]	[3.27750]	[3.84050]	[3.41887]	[3.51555]	[4.63580]

Table -14: Estimation of Co-integration and Adjustment Coefficient (UK)

Vector Error Correction Model (UK)

By putting the data of table-14 in equation form, the equation shows relationship of the variable as under:

CAB = 12582.42 + 1.638404Exp - 2.009399Imp + 0.378487FDI + 0.181065Wr + 0.367524$GovtCosmp$. ------ *(Eq.7)*

One % boosts up of export causes 1.638 % increase of current account balance in UK. In contrast to export, 1 % boosts up of import will bring 2.01 decrease of current account balance of UK. While 1 % increase in the government consumption causes 0.3675 increases in current account balance of UK. However, the foreign direct investment and workers' remittance in the estimated equation is also positive. It means 1 % increase in the foreign direct investment and workers' remittance that will bring the increase of 0.378 % and 0.181 % in the current account balance of UK respectively.

4.3.3 Multiple Regression (UK)

Estimation of long-term co-integrating vector of United Kingdom is given in the table 15.

Normalized Co integrating Coefficients

GDP(-1)	CAB(-1)	C
1.000000	56.34154	-46918.80
	(10.7539)	
	[5.23919]	

Adjustment Coefficient

D(GDP)	D(CAB)	
-0.042373	0.007558	
(0.02516)	(0.00257)	
[-1.68414]	[2.93768]	
Standard errors in parentheses & t-statistics in brackets		

Table -1 5: Estimation of Co-integration and Adjustment Coefficient (UK)

Vector Error Correction Model 2 (UK)

By putting the data of table 15 in equation forms, it shows the relationship of the variable as given below:

$GDP = 46918.80 + 56.34154CAB$ ---------- *(Eq.8)*

Above equation describes that 1 % increase in the current account balance causes 56.34 % increase in the gross domestic product of UK.

4.4 SINGAPORE

4.4.1 Testing of Unit Roots Hypothesis (Singapore)

By applying the test of Augmented Dickey-Fuller (ADF) unit root hypothesis for the stationary of the data on the Levels and the First difference of current account balance, export, import, foreign direct investment, government consumptions, Workers' remittance and gross domestic product for Singapore from FY 1977 to 2007, because it leads to the accuracy of the results. The previous three kinds of conditions (as discussed in section 4.1.1, 4.2.1 and 4.3.1) which were used on the data of USA, Japan and UK to check the stationary has been similarly used on the data of Singapore. In this regard time series graph of all the variables were plotted. Figure-11

demonstrates time series graph of current account balance, export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic product of Singapore.

4.4.1.1 Graphical Representation (Singapore)

Through observation of graphs of all the variables in the model, It is examined that export, import, government consumption and gross domestic product have trend in the time series data on the Level. On the other hand current account balance, foreign direct investment, and workers' remittance don't have any trend in the data at the Levels.

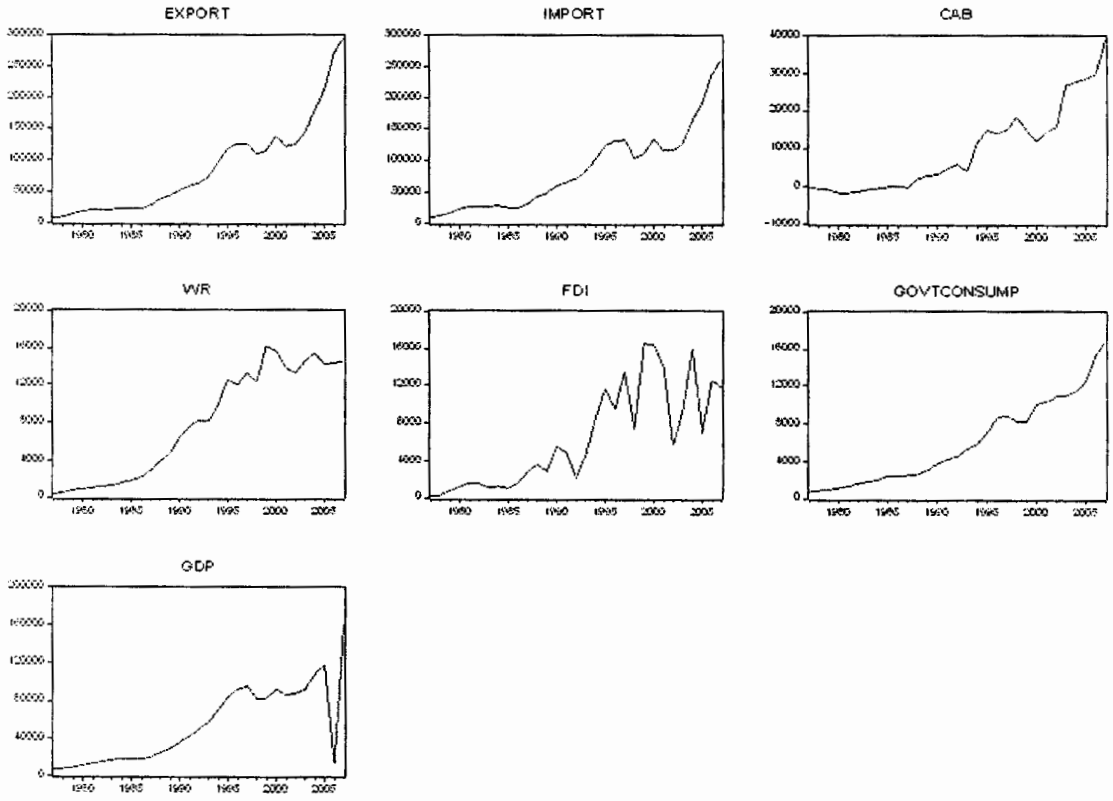

Fig. 11: Singapore: Time series graphs of different variables on the levels (Million USA$)

4.6.1.2 Results of the Unit Root Hypothesis (Singapore)

All the variables (current account balance, export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic product) have a unit root in their Levels and are stationary in their First difference.

Table 16 -: Result of unit root test: Singapore

Variables	Types of test (c, t , n)	ADF test Statistics	D-W Statistics	Probability
Export	C 0 1	3.413983	1.455493	1.0000
Δ Export	C 0 1	-2.768184***	1.986580	0.0753
Import	C 0 1	2.311999	1.447855	0.9999
Δ Import	C 0 1	-3.149271**	1.988407	0.0339
CAB	C 0 1	1.551462	2.019760	0.9991
Δ CAB	C 0 1	-4.450280*	1.772766	0.0015
FDI	C 0 1	-2.085894	2.514343	0.2513
Δ FDI	C 0 1	-8.253646*	2.271407	0.0000
Wr	C 0 1	-0.691548	2.232178	0.8341
Δ Wr	C 0 1	-5.914751*	2.030160	0.0000
Govt. Comp.	C 0 1	2.837903	1.619332	1.0000
Δ Govt. Comp.	C 0 1	-3.238943**	1.874708	0.0278
GDP	C 0 1	-1.089648	2.250773	0.7018
Δ GDP	C 0 1	-11.21913*	2.138749	0.0000

Note:

*Null hypothesis does not accept at 1% level.

** Null hypothesis does not accept at 5% level.

*** Null hypothesis does not accept at 10 % level.

Probability = P-values [MacKinnon (1996)]

Δ = First differential

Current account balance, foreign direct investment, workers' remittance and gross domestic product are at 1 % significant Level. Imports and government consumption are at 5 % significant level while export is at 10 % significant Level.

4.4.2 Johansen Co-integration Test (Singapore)

The long–term equilibrium relationship of current account balance of Singapore with export, import, foreign direct investment, government consumptions, and workers' remittance is examined with the application of co-integration test.

4.4.2.1 Statistics for VAR Lag Order Selection of Singapore

Table -17: Statistics for VAR Lag Order Selection: Singapore

Lag	FPE	AIC	SC	HQ
0	1.53e+43	116.4665	116.7520	116.5538
1	5.19e+39	108.4101	110.4085	109.0210
2	5.32e+38	105.7357	109.4469	106.8703
3	1.68e+37*	100.9689*	106.3929*	102.6271*

* Indicates lag order selected by the criterion

FPE	Final Prediction Error
AIC	Akaike Information Criterion
SC	Schwarz Information Criterion
HQ	Hannan-Quinn Information Criterion

Through the analysis, it is found that all the series of six variables (current account balance, export, import, foreign direct investment, government consumptions, and workers' remittance) are integrated in order one [*I* (1)] for Singapore. The result proves the co-integrated relationship with each other. Table 17 shows the results of the optimal Lag selection and results are according to Lag 3 in the VAR model.

4.4.2.2 VAR Co-integration Test Statistics (Singapore)

Trace test indicates four co-integration equations at 5% and 1% Levels. Max-Eigenvalue test indicates two co-integration equations at 5% and 1% Levels. This means that there are four co-integration equations (r = 4) in six variables at 5 % significance Level. Therefore, the annual data from 1977 to 2007 firmly supports that in Singapore, there exists a long-term relationship in the variables.

Table -18 VAR Co-integration test Statistics: Singapore

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistics	5 Percent Critical Value	1 Percent Critical Value
r = 0 **	0.889799	184.8366	94.15	103.18
r ≤ 1**	0.783762	120.8786	68.52	76.07
r ≤2**	0.734675	76.46867	47.21	54.46
r ≤3**	0.602189	37.99143	29.68	35.65
r ≤4	0.319074	11.25986	15.41	20.04
r ≤5	0.003962	0.115122	3.76	6.65

Hypothesized No. of CE(s)	Eigenvalue	Max Eigenvalue	5 Percent Critical Value	1 Percent Critical Value
r = 0 **	0.889799	63.95797	39.37	45.10
r ≤ 1 **	0.783762	44.40995	33.46	38.77
r ≤2	0.734675	38.47724	27.07	32.24
r ≤3	0.602189	26.73157	20.97	25.52
r ≤4	0.319074	11.14473	14.07	18.63
r ≤5	0.003962	0.115122	3.76	6.65

*(**) Indicates rejection of the hypothesis at the 5%(1%)level

4.4.2.3 Multiple Regression (Singapore)

Estimation of long-term co-integrating vector of Singapore is given in the table 19.

Normalized Co integrating Coefficients

CAB	EXPORT	IMPORT	FDI	WR	GOVTCOMP	C
1.00	0.348404	-2.225543	14.29606	5.957396	32.77069	439
	(0.98443)	(0.83423)	(1.96723)	(3.65305)	(7.31256)	
	[0.35392]	[-2.66777]	[-7.26709]	[1.63080]	[4.48143]	

Adjustment Coefficients

D(CAB)	D(EXPORT)	D(IMPORT)	D(FDI)	D(WR)	D(GOVTCUP)
0.041902	0.138491	0.129066	0.024300	-0.001576	-0.002458
(0.01572)	(0.06147)	(0.06176)	(0.02067)	(0.00631)	(0.00321)
[2.66492]	[2.25314]	[2.08967]	[1.17566]	[-0.24975]	[-0.76568]

Table -19: Estimation of Co-integration and Adjustment Coefficient: Singapore

Vector Error Correction Model (Singapore)

By putting the data of the table 19 in equation form, the equation shows the relationship of the variables as under:

$CAB = - 439.1074 + 0.3484\ Exp - 2.225Imp + 14.276FDI + 5.955Wr - 32.77GovtConsump$-- *(Eq.9)*

1 % boost up of export leads to 0.3484 % increase in current account balance of Singapore. In contrast to the export, 1 % boost up of import leads to 2.22 % decrease in current account balance of Singapore. Furthermore, 1 % increase in the government consumption leads to 32.77 % decrease in current account balance of Singapore. Foreign direct investment and workers' remittance in the estimated equation is positive which means 1 % change (increase) in the foreign direct

investment that will increase the current account balance of Singapore by 14.27 % While workers' remittance will increase the current account balance of Singapore by 5.955 %.

4.4.3 Multiple Regression (Singapore)

Estimation of long-term co-integrating vector of Singapore is given in the table 20.

Normalized Co integrating Coefficients

GDP(-1)	CAB(-1)	C
1.000000	2.844503	-77154.77
	(3.16051)	
	[0.90001]	

Adjustment Coefficient

D(GDP)	D(CAB)
-0.107665	0.010404
(0.06964)	(0.00977)
[-1.54612]	[1.06474]
Standard errors in parentheses & t-statistics in brackets	

Table -20: Estimation of Co-integration and Adjustment Coefficient: Singapore

Vector Error Correction Model 2 (Singapore)

By putting the data of the table 20 in equation forms, which shows the long term relationship of the variable in model 2 as given below:

$GDP = 77154.77 + 2.84CAB$ ---------- --- *(Eq.10)*

Above equation describes that 1 % increase in the CAB of Singapore causes 4.8 % increase in gross domestic product.

4.5 Pakistan

4.5.1 Testing of Unit Roots Hypothesis (Pakistan)

Augmented Dickey-Fuller (ADF) unit root hypothesis test is applied for the stationary of the data on the Levels and the First difference of current account balance, export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic product for Pakistan from FY 1977 to 2007 for the accuracy of the results. Three kinds of conditions (as mentioned in section 4.1.1, 4.2.1, 4.3.1 and 4.4.1) had been truly applied in this test. Figure-12 demonstrates time series graph of current account balance, export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic product for Pakistan.

4.5.1.1 Graphical Representation (Pakistan)

Through observation of the graphs of all the variables, it is found that export, import, and gross domestic product have trend in the time series data on the Level. On the other hand, there is not any trend in current account balance, foreign direct investment, government consumption and workers' remittance in the data at the Level.

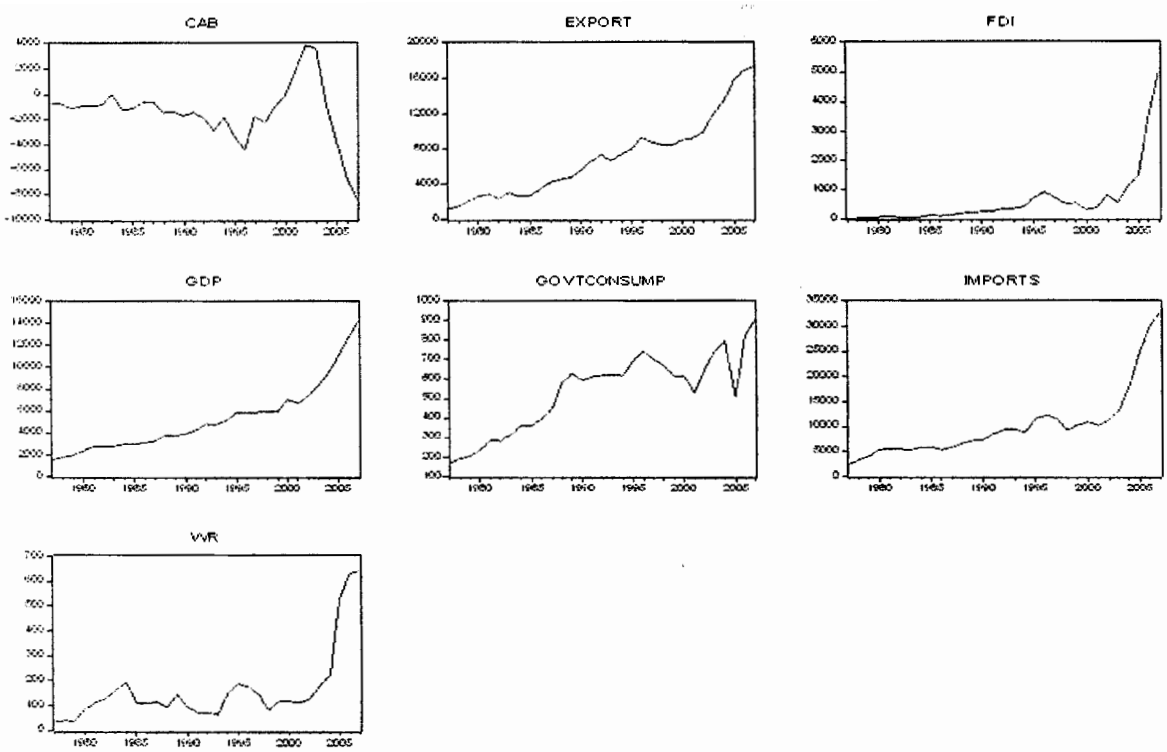

Fig. 12: Pakistan Time series graphs of different variables on the levels (Million USA$)

4.5.1.2 Results of the Unit Root Hypothesis (Pakistan)

The result of the test shows that all the variables current account balance, export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic product have a unit root in their Levels and are stationary in their First differences. The test rejected the null hypothesis that there is a unit root in the first difference in all variables. Export and workers' remittance are at 1 % significant level. While, current account balance and gross domestic product are at 5 % significant level. Moreover, foreign direct investment, government consumption and Imports are at 10 % significant level. In this context Durbin-Watson statistics also supports the value of current account balance, export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic product.

Table- 21: Result of Unit root test: Pakistan

Variables	Types of test (c, t , n)	ADF test Statistics	D-W Statistics	Probability
Export	C 0 1	2.029918	1.627178	0.9998
Δ Export	C 0 1	-3.691764*	2.059414	0.0097
Import	C 0 1	-2.662425	2.088253	0.2580
Δ Import	C 0 1	-3.424255***	1.980280	0.0683
CAB	C 0 1	-3.946652	2.088079	0.0056
Δ CAB	C 0 1	-3.337141**	2.044235	0.0222
FDI	C 0 1	-0.639664	1.842610	0.9681
Δ FDI	C 0 1	-3.253605***	2.887841	0.100
Wr	C 0 1	0.935719	1.653120	0.9946
Δ Wr	C 0 1	-3.943538*	1.993350	0.0053
Govt. Comp.	C 0 1	-1.837143	2.020092	0.3549
Δ Govt. Comp.	C 0 1	-2.839378***	1.868862	0.0672
GDP	C 0 1	3.176007	2.230608	1.0000
Δ GDP	C 0 1	-3.517983**	2.177604	0.0500

Note:

*Null hypothesis does not accept at 1% level.

** Null hypothesis does not accept at 5% level.

*** Null hypothesis does not accept at 10 % level.

Probability = P-values [MacKinnon (1996)]

Δ = First differential

4.5.2 Johansen Co-integration Test (Pakistan)

The long–term relationship of current account balance of Pakistan with export, import, foreign direct investment, government consumptions, and workers' remittance is examined with the application of co-integration test.

4.5.2.1 Statistic for VAR Lag Order Selection (Pakistan)

Table -22: Statistics of VAR Lag Order Selection of Pakistan

Lag	FPE	AIC	SC	HQ
0	7.46e+31	90.41718	90.70265	90.50445
1	7.86e+28	83.49677	85.49507	84.10767
2	3.56e+28	82.30699	86.01813	83.44152
3	4.84e+27*	78.99952*	84.42349*	80.65768*

* Indicates lag order selected by the criterion

FPE	Final Prediction Enrror
AIC	Akaike Information Criterion
SC	Schwarz Information Criterion
HQ	Hannan-Quinn Information Criterion

It is analyzed that all variables (current account balance, export, import, foreign direct investment, government consumptions, and workers' remittance) are integrated in order one [*I* (1)]. Table 22 shows the results of the optimal Lag selection. According to the results, Lag 3 is selected in the VAR model.

4.5.2.2 VAR Co-integration Test Statistic (Pakistan)

It is analyzed with the conduction of Trace test that two co-integration equations are at 5% Level and one co-integration equation is at 1% Level. In this way, Max-eigenvalue test indicates two co-integrating equations at 5% level and Max-eigenvalue test indicates one co-integrating equation is at the 1% level. This means

that there are two co-integration equations (r = 2) in the variables at the significant level of 5 %. Therefore, our annual data from 1977 to 2007 shows that there exists a long-term relationship in current account balance, export, import, foreign direct investment, government consumptions, and workers' remittance.

Table -23 VAR Co-integration test of Pakistan

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
r = 0 **	0.855351	126.3711	94.15	103.18
r ≤ 1*	0.691495	70.30118	68.52	76.07
r ≤2	0.456876	36.19670	47.21	54.46
r ≤3	0.351577	18.49460	29.68	35.65
r ≤4	0.159168	5.931468	15.41	20.04
r ≤5	0.030689	0.903922	3.76	6.65

Hypothesized No. of CE(s)	Eigenvalue	Max Eigenvalue	5 Percent Critical Value	1 Percent Critical Value
r = 0 **	0.855351	56.06996	39.37	45.10
r ≤ 1 *	0.691495	34.10449	33.46	38.77
r ≤2	0.456876	17.70210	27.07	32.24
r ≤3	0.351577	12.56313	20.97	25.52
r ≤4	0.159168	5.027546	14.07	18.63
r ≤5	0.030689	0.903922	3.76	6.65

*(**) Indicates rejection of the hypothesis at 5%(1%)level

4.5.2.3 Multiple Regression (Pakistan)

Estimation of long-term co-integrating vector of Pakistan is given in the table 24.

Normalized Co integrating Coefficients

CAB	EXPORT	IMPORT	FDI	WR	GOVTCOMP	C
1.0	0.484703	-1.772047	9.631546	3.552966	-7.710971	5714.6
	(0.29154)	(0.36453)	(1.59328)	(5.39099)	(1.78349)	
	[1.66259]	[-4.86115]	[6.04511]	[0.65906]	[4.32354]	

Adjustment Coefficients

D(CAB)	D(EXPORT)	D(IMPORT)	D(FDI)	D(WR)	D(G.C)
-0.161356	0.304916	0.622502	-0.012518	0.016006	-0.006019
(0.14833)	(0.06334)	(0.10894)	(0.02332)	(0.00755)	(0.00997)
[-1.08781]	[4.81372]	[5.71420]	[-0.53670]	[2.12037]	[-0.60398]

Table -24: Estimation of Co-integration and Adjustment Coefficient: Pakistan

Vector Error Correction Model (Pakistan)

By putting the data of table 24 in equation form, the equation shows the relationship of the variables as under:

$CAB = -5714.661 + 0.484Exp - 1.77Imp + 9.6FDI + 3.55\text{Wr} - 7.71G.C.$ ------- *(Eq.11)*

The equation shows 1 % boost up of export will lead to 0.484 % rise in the current account balance and 1 % boost up of import will lead to 1.77 % decrease in the current account balance of Pakistan. Furthermore, 1 % increase in the government consumption can cause 7.7 % decrease in current account balance of Pakistan. However, the foreign direct investment and workers' remittance in the estimated equation is positive which means 1 % increase in the foreign direct investment that will lead to increase the current account balance of Pakistan by 9.6 % and workers' remittance will increase the current account balance by 3.55 %.

4.5.3 Multiple Regression (Pakistan)

Estimation of long-term co-integrating vector of Pakistan is given in the table 25.

Normalized Co integrating Coefficients

GDP(-1)	CAB(-1)	C
1.000000	0.215901	-4890.281
	(0.24804)	
	[0.87044]	

Adjustment Coefficient

D(GDP)	D(CAB)	
0.144717	0.011829	
(0.03986)	(0.13021)	
[3.63073]	[0.09085]	
Standards error in parentheses & t-statistics in brackets		

Table -25: Estimation of Co-integration and Adjustment Coefficient of Pakistan

Vector Error Correction Model (Pakistan)

By putting the data of the table 25 in equation forms. The equation shows the relationship of variables for model 2 as given below:

$GDP = 4890.281 + 0.215901 CAB$ ---------- *(Eq.12)*

Above equation describes that 1 % increase in the CAB of Pakistan lead to cause 0.21 % increase in the gross domestic product.

4.6 Malaysia

4.6.1 Testing of Unit Roots Hypothesis (Malaysia)

For the authenticity of the data, Augmented Dickey-Fuller (ADF) unit root hypothesis test was applied on the Levels and the First difference of current account balance, export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic product for Malaysia by data taken from FY 1977 to 2007. Three kinds of conditions (as mentioned in section 4.1.1, 4.2.1 and 4.3.1) had been truly applied in this test. Figure-13 demonstrates time series graphs of current account balance, export, import, foreign direct investment, government consumptions, Worker remittance and gross domestic product for Malaysia.

4.6.1.1 Graphical Presentation (Malaysia)

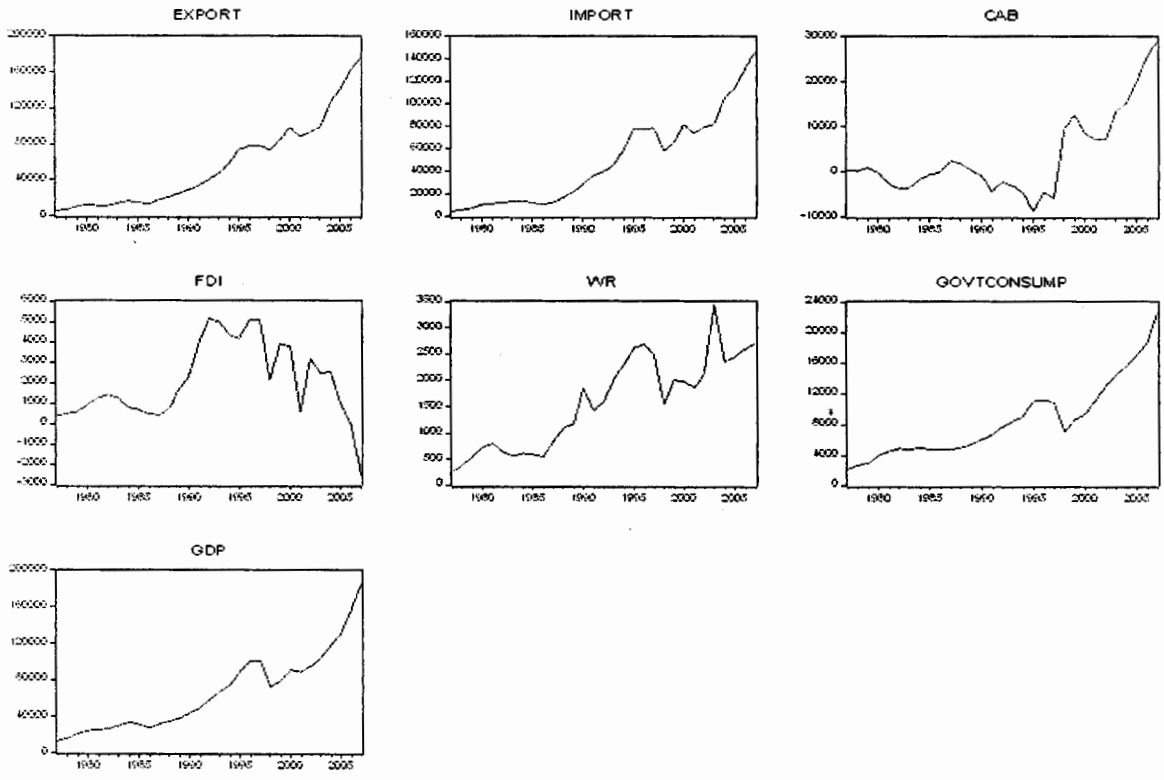

Fig. 13: Time series graphs of different variables on the level of Malaysia (Million USA$)

It is analyzed with the help of the graphs of all the variables that export, import, government consumption and gross domestic product have trend in the time series data at the Level. On the other hand, current account balance, foreign direct investment, and workers' remittance don't have any trend in the data at the levels.

4.6.1.2 Results of the Unit Root Hypothesis (Malaysia)

All the variables (current account balance, export, import, foreign direct investment, government consumptions, workers' remittance and gross domestic product) have a unit root in their Levels and are stationary in their First differences as result displayed in table 26. Import, current account balance, foreign direct investment, and workers' remittance are at 1 % significant level while; government consumptions and export are at 5 % significant level. Moreover, gross domestic product is at 10 % significant level. The Durbin-Watson statistics chiefly supports the value of all the variables (current account balance, export, import, foreign direct investment, government consumptions, worker remittance and gross domestic product).

Table-26 Result of unit root test (Malaysia)

Variables	Types of test (c, t , n)	ADF test Statistics	D-W Statistics	Probability
Export	C 0 1	3.295250	1.763064	1.0000
Δ Export	C 0 1	-3.270403**	2.051338	0.0259
Import	C 0 1	1.719765	1.859873	0.9994
Δ Import	C 0 1	-4.139924*	1.976024	0.0032
CAB	C 0 1	0.690096	1.912704	0.9899
Δ CAB	C 0 1	-4.637188*	2.002438	0.0009
FDI	C 0 1	-1.185627	1.979232	0.6673
Δ FDI	C 0 1	-5.827454*	1.858971	0.0000
Wr	C 0 1	-1.467802	2.405241	0.5358
Δ Wr	C 0 1	-6.895704*	2.121682	0.0000
Govt. Comp.	C 0 1	2.313000	1.650292	0.9999
Δ Govt. Comp.	C 0 1	-3.137034**	1.868966	0.0348
GDP	C 0 1	2.463552	1.377110	0.9999
Δ GDP	C 0 1	-2.648121***	1.827419	0.0953

Note:

*Null hypothesis does not accept at 1% level.

** Null hypothesis does not accept at 5% level.

*** Null hypothesis does not accept at 10 % level.

Probability = P-values [MacKinnon (1996)]

Δ = First differential

4.6.2 Johansen Co-integration Test (Malaysia)

The long–term relationship of current account balance of Malaysia with export, import, foreign direct investment, government consumptions, and workers' remittance is examined with the application of co-integration test.

4.6.2.1 Statistics for VAR Lag Order Selection (Malaysia)

Table -27: Statistics for VAR Lag Order Selection of Malaysia

Lag	FPE	AIC	SC	HQ
0	1.91e+40	109.7790	110.0645	109.8663
1	2.68e+37	103.1446	105.1429	103.7555
2	6.94e+36	101.3966	105.1077	102.5311
3	1.00e+34*	93.54172*	98.96570*	95.19989*

* indicates lag order selected by the criterion

FPE	Final Prediction Error
AIC	Akaike Information Criterion
SC	Schwarz Information Criterion
HQ	Hannan-Quinn Information Criterion

The analysis shows that all the series of the six variables current account balance, export, import, foreign direct investment, government consumptions, and worker remittance are integrated in order one [*I* (1)]. Table 27 shows the results of the optimal Lag selection, for the results of these test, Lag 3 in the VAR model was selected.

4.6.2.2 VAR Co-integration Test Statistics (Malaysia)

The implementation of the Trace test shows two co-integration equations at 5% and 1% Levels. Max-Eigenvalue test indicates two co-integration equations at 5% level

and 1 co-integration equation at 1% level. This means that there are two co-integration equations (r = 2) in six variables. Therefore, the annual data from 1977 to 2007 strongly props the intention that in Malaysia, there exists a long-term relationship in all above-mentioned variables.

Table -28 VAR Co-integration test Statistics of Malaysia

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistics	5 Percent Critical Value	1 Percent Critical Value
r = 0 **	0.870199	140.3817	94.15	103.18
r ≤ 1**	0.735049	81.17082	68.52	76.07
r ≤2	0.578246	42.65277	47.21	54.46
r ≤3	0.336843	17.61613	29.68	35.65
r ≤4	0.152643	5.704560	15.41	20.04
r ≤5	0.030598	0.901211	3.76	6.65

Hypothesized No. of CE(s)	Eigenvalue	Max Eigenvalue	5 Percent Critical Value	1 Percent Critical Value
r = 0 **	0.870199	59.21090	39.37	45.10
r ≤ 1 *	0.735049	38.51805	33.46	38.77
r ≤2	0.578246	25.03664	27.07	32.24
r ≤3	0.336843	11.91157	20.97	25.52
r ≤4	0.152643	4.803349	14.07	18.63
r ≤5	0.030598	0.901211	3.76	6.65

*(**) Indicates rejection of the hypothesis at 5%(1%)level

4.6.2.3 Multiple Regression (Malaysia)

Estimation of long-term co-integrating vector of Pakistan is given in the table 29.

Normalized Co integrating Coefficients

CAB	EXPORT	IMPORT	FDI	WR	GOVTCMP	C
1.0	0.293921	- 0.703708	-4.828781	41.02481	-5.726137	-13681
	(0.25748)	(0.38113)	(1.48509)	(5.2194)	(1.15794)	
	[-1.14154]	[1.84636]	[3.25151]	[7.855]	[4.94513]	

Adjustment Coefficient

D(CAB)	D(EXPORT)	D(IMPORT)	D(FDI)	D(WR)	D(GVTCOMP)
0.141186	0.143751	-0.190832	-0.080919	0.006252	0.013089
(0.07354)	(0.10102)	(0.11661)	(0.01490)	(0.00845)	(0.01910)
[1.91983]	[-1.42305]	[-1.63652]	[-5.43073]	[0.74009]	[0.68536]

Table -29: Estimation of Co-integration and Adjustment Coefficient: Malaysia

Vector Error Correction Model (Malaysia)

By putting the data of table 29 in equation form, shows the relationship of the variables as given below:

$CAB = 13681 + 0.294Exp - 0.704Imp - 4.83FDI + 41.03\text{Wr} - 5.73G.C.$ -------- *(Eq.13)*

The analysis shows that 1 % increase in the export will lead to causes 0.294 % increase in current account balance of Malaysia, and 1 % increase in the import will bring 0.704 % decrease in current account balance of Malaysia. Furthermore, 1 % increase in the government consumption causes 5.73 decrease in the current account balance of Malaysia. However, the workers' remittance and foreign direct investment in the estimated equation is positive. It means 1 % increase in the workers' remittance will lead to increase current account balance by 41.03 % and 1 %increase in foreign

direct investment will decrease current account balance of Malaysia by 4.83 %.

4.6.3 Multiple Regression (Malaysia)

Estimation of long-term co-integrating vector of Pakistan is given in the table 30.

Normalized Co integrating Coefficients

GDP(-1)	CAB(-1)	C
1.000000	0.184801	-64669.82
	(1.32827)	
	[0.13913]	

Adjustment Coefficient

D(GDP)	D(CAB)	
-0.002740	0.076436	
(0.05558)	(0.02353)	
[-0.04930]	[3.24798]	
Standards error in parentheses & t-statistics in brackets		

Table -30: Estimation of Co-integration and Adjustment Coefficient: Malaysia

Vector Error Correction Model (Malaysia)

By putting the data of the table 30 in equation forms, it shows the relationship of the variable for model 2 as given under:

$GDP = 64669.82 + 0.184801CAB$ ---------- *(Eq.14)*

Above equation describes that 1 % increase in current account balance causes 0.184801 % increase in the gross domestic product of Malaysia.

4.7 Chapter Summary

Chapter contains the empirical results and findings by using Vector Auto-regression and Vectors Error Correction models. It is consisted of unit roots hypothesis, Johannes co-integration test, statistics for VAR lag order selection, VAR co-integration test statistic, estimation of co-integration and adjustment coefficient, vector error-correction model, and comprised of brief discussion of the results.

Chapter 5

5. ANALYSIS OF RESULTS

This chapter is based on the analysis of the results of our estimated model and the suggestions for the optimal solution of the problem.

5.1 Analysis of Exports: Developed and Emerging Economies

This analysis shows a positive correlation of the current account balance with the exports in both developed and emerging economies.

Developed Economies	Export
USA	1.553
Japan	0.743
UK	1.638

Emerging Economies	Export
Malaysia	0.294
Pakistan	0.484
Singapore	0.3484

Table-31 Comparison of Exports between developed and emerging countries

It is concluded from the above table that change in the volume of exports of developed countries are affecting more to current account balance. On the other hand, in emerging market change in the volume exports are affecting less to current account balance. Thus developed countries are more export oriented than the emerging countries. This is one of the reasons that the exports are highly sensitive towards the

current account balance in the developed countries as compared to that of emerging countries.

5.2 Analysis of Imports: Developed and Emerging Economies

It is analyzed that there is a negative correlation of the current account balance with the imports in both developed and emerging economies.

Developed Economies	Import
USA	-1.538
Japan	-0.887
UK	- 2.00

Emerging Economies	Import
Malaysia	- 0.704
Pakistan	- 1.77
Singapore	- 2.22

Table-32 Comparison of Imports between developed and emerging countries

From the above table it is observed that change in the volume of imports of developed countries is affecting less to current account balance. While on the other hand, in the emerging countries the change in the volume of imports are affecting more to current account balance because emerging countries are used to import raw material instead of high-tech or capital assets. Another major reason is that the burden of POL (petrol, oil, and lubricants) in the emerging economies is more than that of the developed countries.

5.3 Analysis of Foreign Direct Investment: Developed and Emerging Economies

There is an observation of finding both positive and negative correlation in the current account balance with the foreign direct investment in developed and emerging economies.

Developed Economies	FDI
USA	+ 0.388
Japan	-1.22
UK	+ 0.378

Emerging Economies	FDI
Malaysia	- 4.8
Pakistan	+ 9.6
Singapore	+ 14.2

Table-33 Comparison of FDI between developed and emerging countries

It is concluded from the above table that changes in the foreign direct investment of developed countries are affecting less to current account balance. While on the other hand in emerging market, change in foreign direct investment is affecting more to current account balance.

The reason of positive foreign direct investment in emerging countries and developed countries is that investment is made in export productive sector. If export increases this has a positive effect on the current account balance. Another reason is that

foreign direct investment is made on the manufacturing sector where import burden on the countries is less. So, the ultimate effect on the current account balance is positive. The reason of negative foreign direct investment in emerging countries and developed countries is that investment is not made in export productive sector. If export decreases, this has a negative effect on the current account balance. It is due to the foreign direct investment in the manufacturing sectors where import burden on the countries is high. So, the ultimate effect on the current account balance is positive.

5.4 Analysis of Workers' Remittances: Developed and Emerging Economies

The analysis shows a positive correlation of the current account balance with the workers' remittance in both developed and emerging countries.

Developed Economies	Wr
USA	+ 0.567
Japan	+0.212
UK	+0.18

Emerging Economies	Wr
Malaysia	+41.03
Pakistan	+ 3.55
Singapore	+ 5.95

Table-34 Comparison of Wr between developed and emerging countries

It is observed from the above table that workers' remittance of developed countries is affecting less to current account balance. While on the other hand in emerging market, workers' remittance is affecting more to current account balance. One of the

reasons for more positive relationship with current account balance is that in emerging economies the percentage of the people going abroad for jobs and opportunities is high. On the other hand, in the developed countries people prefer own local jobs. Furthermore, in the developed countries native workers are highly paid in contrast to the workers of the emerging countries where the workers are low paid. So, it has played an imperative role in dropping the current account balance deficit.

5.5 Analysis of Government Consumption (G.C): Developed and Emerging Economies

In this analysis there is a positive/negative correlation of the current account balance with the government consumption in both developed and emerging economies.

Developed Economies	G.C
USA	- 0.049
Japan	+0.167
UK	+ 0.367

Emerging Economies	G.C
Malaysia	- 5.7
Pakistan	- 7.7
Singapore	-32.77

Table-35 Comparison of G.C between developed and emerging countries

It is observed from the above table that changes in the government consumption of developed countries are affecting less to current account balance. While on the other

hand, in emerging market change government consumptions are affecting more to current account balance. The reason of positive value of government consumption is that it is made in productive sector. Productive sector includes government consumption in industries, infrastructure, low loan and facilitation (etc), which enhances the export of the countries and its impact is positive on the current account balance. Japan and United Kingdom are the countries that have the positive relation with the current account balance. The reason of negative government consumption is that it is made in non-productive sector. Non-productive sector includes government consuming in heath, education, school, and rebates facilitation (etc), which has not affected the export of the countries and ultimately generates negative effect on the current account balance. Singapore is one of the countries in the developed and emerging economies that consumes more on the non-productive sector.

5.6 Analysis of Economic Growth with Current Account Balance: Developed and Emerging Economies

Developed economies

Country	CAB
USA	4.76
Japan	20.01
UK	56.34

Emerging Economies

Country	CAB
Malaysia	0.184
Pakistan	0.215
Singapore	2.84

Table-36 Comparison of current account balance and gross domestic product between developed and emerging economies

The analysis shows a positive correlation of the current account balance with the Economic growth of the country (gross domestic product) in both developed and emerging economies. The change in current account balance of developed countries affects more to the gross domestic product. While, on the other hand, in emerging economies adjustment in the Current account balance are affecting less to gross domestic product.

5.7 Chapter Summary

This chapter is based on the detailed analysis of results and comprehensive discussion. After the analysis of the results, suggestions are given for the optimal solution of the problem and improvement in the present situation of the current account balance, and for the different economic factors that influence the current account balance, such as, (exports, imports, government consumption, workers remittances, foreign direct investment) and the impact of current account balance on the economic growth of the developed and emerging countries.

CONCLUSION

This research study is aimed to investigate the economic factors, which influence the current account balance in the developed and emerging economies. For this purpose three developed countries (United states of America, Japan, and United Kingdom) and three emerging economies (Malaysisa, Pakistan, and Singapore) were selected. The latest econometric techniques were applied to find accurate results. To achieve this purpose vector auto-regression and vector error correction model was applied. The time span of annual data is from FY 1977 to 2007. Data was taken from IMF and Asian Development Bank.

The findings in this research study reveal a considerable association of export and current account balance in emerging and developed economies. In Developed Economies there is 1 % rise in export, which leads to bring the increase in the current account balance of USA by 1.553 %, in Japan 0.743 % and in UK 1.638 %. On the other hand, in Emerging Economies there is 1 % increase in export, which further leads to increase the current account balance of Singapore to the level of 0.3484 %, 0.484 % in Pakistan and 0.294 % in Malaysia. Moreover, In Developed Economies there is 1 % boost up of import, which leads to bring the decrease in the current account balance of USA by 1.538 %, in Japan 0.887 % and in UK 2.01 %. While, in Emerging Economies there is 1 % increase in import which further leads to decrease the current account balance of Singapore to the level of 2.22 %, 1.77 % in Pakistan and 0.704 % in Malaysia. The findings examined that there exists a strong association of government consumption with current account balance in emerging and developed economies. In Developed economies there exists a positive relationship of

government consumption with current account balance in Japan and UK. While in Emerging negative relationship exists. In developed countries as well as emerging countries there exists a positive relationship of workers' remittance with current account balance but the magnitude of workers' remittance is stronger in emerging countries as compared to developed countries. In Emerging countries and Developed countries here exists a negative as well as positive relationship of foreign direct investment with current account balance but its magnitude is stronger in emerging countries as compared to Developed countries. The findings of research study advocates that in both developed and emerging countries same selected economic factors affect the current account balance. However, their level of significance, direction and magnitude are different. For example, government consumption in UK has a positive correlation with current account balance on the other hand it has a negative correlation in Malaysia. While magnitude of government consumption with current account balance in USA is 0.049 % and in Malaysia is 5.7 %.

Second objective was to examine the association of current account balance with economic growth. It is concluded that considerable connection exists between current account balance and economic growth of the country in Emerging and Developed countries. Our findings strongly advocate that there exists a strong relationship of current account balance with economic growth of the countries while in emerging economies its impact is very less. For example in USA, the magnitude of current account balance with gross domestic product is 20 % and in Malaysia 0.18 %. So, the magnitude of current account balance on the gross domestic product is very high in developed economies as compared to the emerging economies.

It is also included in our objective to provide guidelines for policy makers and economists for designing policies in order to overcome the problems.

Firstly, the emerging countries should considerate on the export of value added products, which will not only reduce the current account deficit but also improve the economic growth. To increase the export volume of value added products, the government must improve the performance of industrial and agriculture sector. Government should provide financial and other facilities to small and medium industrial and landowners. Government should adopt such policies that should motivate the producers to manufacture the finished and semi-finished products.

Secondly, Emerging and Developed countries should try to establish more domestic industries. This step will help to fulfill domestic demand (which is being imported from other countries) while the excessive domestic production can be exported to other countries. Ultimately, it will reduce the current account deficit.

Thirdly, government of emerging countries should make policies to produce the skilled labors and posted abroad. This will make a healthy effect on current account balance.

Furthermore, factors such as exchange rates, budget deficit, and agriculture growth rate which affects the current account balance would be included for future research work. Finally, the conclusion drawn from the present empirical study may not be necessarily applied to other countries. The results will be different from country to country and for one period to another. In this regard, the same empirical study and methodology can be applied on different countries.

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