Interactions between Financial Sector Development, Foreign Direct Investment, and Economic Growth in Japan

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Submitted to the
Institute of Graduate Studies and Research
in partial fulfillment of the requirements for the Degree of

Master of Science
in
Banking and Finance

Eastern Mediterranean University
January 2013
Gazimağusa, North Cyprus

Approval of the Institute of Graduate Studies and Research

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ABSTRACT

The aim of this study is to analyze the relationship between financial development, foreign direct investment, and economic growth in Japan by using time series annual data. Results show that financial sector and foreign direct investment in Japan have a long term and significant impact on economic growth. Real income significantly converges to its long-term equilibrium path through financial sector and foreign direct investment. Furthermore, real income growth also exerts statistically significant and positive impact on financial development in Japan while foreign direct investment does not.

Keywords: Financial Development; Foreign Direct Investment; Economic Growth; Error Correction Model.

ÖZ

Bu tez çalışması Japonya'da yıllık verileri kullanarak finansal büyüme, yabancı direkt yatırımlar, ve ekonomik büyüme arasındaki ilişkiyi incelemeyi hedeflemektedir. Çalışmanın sonuçları bu üç değişken arasında uzun dönemli, bir denge ilişkisi olduğunu göstermektedir. Japonya'da reel gelir uzun dönem denge seviyesine finansal faaliyetler ve yabancı direct yatırımlar aracılığı ile yaklaşmaktadır. Reel gelirin de aynı zamanda finansal büyüme üzerinde istatistiki olarak anlamlı ve uzun dönemli bir etkiye sahip olduğu bu çalışmada ortaya konulmuştur.

Anahtar kelimeler: Finansal Büyüme; Yabancı Direkt Yatırımlar; Büyüme; Hata Düzeltme Modeli.

ACKNOWLEDGMENTS

I would like to thank my supervisor Assoc. Prof. Dr. Salih Katırcıoğlu for his continuous guidance, support, opinion, and encouragement in the preparation of this thesis.

I would like to express my special thanks to my family for their invaluable and continuous support throughout my studies and my life

Furthermore, I would like to thank all of my friends for their endless support and encouragement in my life.

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller test
ARDL	Auto Regressive Distributed Lag
ECM	Error Correction Model
ECT	Error Correction Term
FD	Financial Development
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
LR	Long Run
PP	Phillips-Perron test
ZA	Zivot-Andrews Test:

Chapter 1

INTRODUCTION

Investigating the impact of financial development and foreign direct investment on economic growth is popular topic in development economics. In addition, there are lots of studies that show this connection, (Katircioglu & Jenkins, 2010; Katircioglu & Naraliyeva, 2006). However, it is not happened for the relationship between these three variables together. In this thesis, any short-run or long run relationship between foreign direct investment and financial development with economic growth in Japan will be investigated during 1977-2011.

Annual percent change of gross domestic product (GDP) measures economic growth. Over time when economy can increase the amount of the goods and services, economic growth will be happen. In addition, a sustainable rate of economic growth is the primary aim of developing and less developed countries.

Foreign direct investment (FDI) is direct investment by a company that is located in another country. FDI provides cheaper wages in the country, tax exemptions, and tariff-free access to the markets of the country or the region.

FDI has some positive effects, among which are the improvement in the technology, job opportunities, managerial skills, international production network, employee training, international financial integration, and also provides an inflow of foreign capital and funds (Barro and Sala-i-martin, 1997; Grossman and Helpman, 1991).

Financial systems simplify the trading, hedging, diversifying, and pooling of risk, allocate resources, monitor managers and exert corporate control, mobilize savings, and ease the exchange of goods and services (Levine, 1997). It is, widely accepted that well functioning financial markets can positively contribute to economic growth in both developed and developing economies. (Kar et al., 2011).

An increase in savings and investment rate eventually lead to economic growth (Becsi & Wang, 1997). Most developing countries have reformed their economic and financial systems to improve the efficiency of their financial intermediaries with the objective of achieving financial sector development and promoting growth starting in the 1980s (Hassana et al., 2011).

Eller et al. (2006) during 1996 to 2003 via panel data model in 11 Central and Eastern European countries investigate that FDI supports economic growth in the existence of sufficient human capital and develops financial sectors by emerging markets.

Lee and Chang (2009) by applying panel co-integration and panel error correction models for 37 countries for the period 1970-2002, explore the

causal link and strong long-run relationship among FDI, financial development, and economic growth and also indicate that FDI have a largereffect on economic growth.

Baharumshah & Law (2010) in 85 countries investigate that the effect of FDI depends on the level of economic freedom in the host countries and FDI by itself has no direct (positive) effect on output growth.

1.1 Aims and Importance of the Study

Empirical research that is mentioned above investigates a connection between foreign direct investment (FDI) and financial development, and economic growth. However, many of them have only focused on FDI in the absence of financial development. On the other hand, many studies have considered the impact of the financial development while ignoring (FDI). In addition, there is less research that studies connections among these variables: FDI, financial development, and economic growth simultaneously. There for this issue deserves more attention and has made a good discussion that "is there any short–run or long-run relationship among these variables"? Thus, this thesis empirically studies any possible causal link and significant long run or short-run relationship between these variables through some methodologies like: ARDL approach and error correction models.

In this study, Japan is selected among other countries because Japan has the fourth largest economy in the world after USA, China, and India despite of existence of nuclear shocks, wars, continuous earthquake, Tsunami that cause lots of economic dropdowns.

1.2 Structure of the Study

The rest of the thesis is organized as follows: chapter 2, following this introduction chapter, reviews some previous studies that carried out in this area. In chapter 3, the main economic indicators (financial development, foreign direct investment, economic growth) of Japan will be historically evaluated. In chapter 4, theoretical background of the study will be presented. In chapter 5, data, methodology, and econometrics approaches to investigate empirical relationships between financial development and foreign direct investment and impact of them on the real income of Japan will be presented and elaborated. Chapter 6 will cover the analysis of the data and results. In the final chapter, the main finding of the study will be summarized and based on, shortcomings of the study and suggestions will be mentioned.

Chapter 2

LITERATURE REVIEW

In this section, existing literature will be briefly reviewed focusing on the relationship between financial development, FDI and economic growth.

Fung (2009) by considering the interaction between the real and financial sectors suggests strong evidence for conditional convergence in financial sector development and economic growth.

Hermes & Lensink (2003) argue that benefits of FDI can be enhanced by financial development, and this opinion is also supported by Carkovic & Levine (2005) and Kose et al. (2008). Luntiel et al. (2008) by applying a sample of 10 developing economies suggest that there is bilateral relation between financial sector development and economic growth.

There are other numerous studies that investigate the relationship between financial sector development and economic growth, Ang (2009) for India and Malaysia; Hsu and Lin (2000) for Taiwan, Liu and Hsu (2006) for Taiwan, Korea and Japan; Anwar and Nguyen (2011) for Vietnam; Perera and Paudal (2009) for Sri Lanka, and Jalil and Feridun (2011) for Pakistan.

De Mello (1997) reports that FDI may improve economic growth through adopting new technology in the production process and proposing alternative

management and organizational competencies. Katicioglu and Naraliyeva (2006) and Hermes and Lensink (2003) predict that development of financial markets of the host country is contingent to the impact of FDI on economic growth. Rajan and Zingales (1998) found that promoting economic growth can be caused by reducing the cost of external finance by expanding the financial development in the industry level.

Al-Avad & Harb (2005) by using panel co-integration approach for ten MENA countries, in the period 1969–2000 suggest that the financial development and economic growth can be related in long run but causality evidence of the short-run is very weak.

Abu-Bader & Abu-Qarn, (2008) proves the existence of causal relationship between financial development and economic growth in five out of the six Middle Eastern and North African countries except in Israel by applying four different measures of financial development and autoregressive framework and also employing Toda and Yamamoto approach to Granger causality.

King and Levine (1993) use cross-countries data in order to analyze the relationship between economic growth and the financial development. They investigate the existence of a positive correlation between financial indicators and economic growth but negative effect of government intervention on the financial system.

Demirguc-Kunt & Levine (1996) indicate a positive relationship between stock market and financial institutions development by using 44 cross-

countries data from 1986 to 1993. Demetriades & Hussein (1996) by applying time series data for 16 countries show that finance has a leading role in the process of economic development.

Odedokun (1996) employs time series data for 71 developing countries and by focusing on banking sector development and ignoring the effect of stock market development shows that economic growth is promoted by financial intermediation in 85% of those countries.

Chapter 3

BRIEF OVERVIEW OF FINANCIAL DEVELOPMENT, FOREIGN DIRECT INVESTMENT, AND ECONOMIC GROWTH IN JAPAN

3.1 Japan in Brief

Japan is an island nation of East Asia that is placed in the North of Pacific Ocean. Japan comprises 6,852 islands, the main and largest islands that have formed ninety-seven percent of this country are, Hokkaido, Honshu, Kyushu, and Shikoku. Largest metropolitan area in the world with more than 30 million residents is Tokyo, which is capital of Japan, (Japan-guide, 2012).

Population of Japan has fallen by 285,256 in October 2011 in compare with 2008 that is reached the peaked at 128,083,960 (World bank, 2012), and Japan still is the tenth most crowded and populous country in the world, with total Population of 127,817,277 on 2011, but this number will be declined by about one million every year (Population action, 2012).

More than 40% of the population is expected to be more than age of 65 on 2060, and low rate of the birth and foreign immigration will decline the number of the people of working age and sufficient labor force and also cause

an increase in the elder population that cannot be responded to economic needs (BBC News, 2012).

3.2 Brief Overview of the Japanese Economy and Financial Situation

Japan stands as the fourth largest economy in the world after US, China, and India as it mentioned before. In 2011 Japan's GDP was $5.9 trillion compared to $15.1 trillion in United States (Word bank 2012). After the post-war period, from the mid-1950s until 1960s, the Japanese economy grew rapidly, Japanese companies started to foreign direct investment in late 1960s and the average of growth rate was 11 percent during the 1960s. By year, 1968 Japan was the second largest economy after USA (Hays, 2009).

The two oil crises in the 1970s caused high level of inflation. The oil crises show Japan's economic dependency on importation of oil as a source of energy In this period, Japan started to cost saving by allocating more capital for providing energy and labor saving production-technology which both had an effect on achieving success in international arena. Until 1980, Japan's economy was considered as an economic miracle, that this rapid growth caused by having the appropriate social structure, government industrial policies, and existence of highly educated Japanese and enormous workforce (Hays, 2009).

In the mid-1980s, there was decline in the Japan's economy. Government start to recover economy by devoting just 2.5% for official discount rate, and 5 trillion Yen to public works, and reductions of more than 1 trillion Yen in

income tax, but in mid-1980s along with economic recovery, demand increases that Caused the economy to swell again. During the period of 1991-1996, there was huge decline in real estate prices. Furthermore, Japan had to deal with bank crisis and non-performing loans (NLPs), and also trying to keep banks afloat, (Shapira, 1995; Shigeki, 1996).

During 2001-2006 Japan was known as "second" Lost Decade, because of continuing financial and economic distress. The Japanese economy was in a severe condition throughout 2002. General insecurity and worsened employment caused a huge decrease in private consumption, which this situation contributed to the economic inactivity, (Sakamoto & Cargill, 2008).

During 2006-2010, the Japanese economy slowed down, and because of the Earthquake, tsunami, and nuclear shock, Japan experienced a sharp downturn in business investment and financial situation on 2008/2009 (BBC News 2010).

Economy started to recover in 2010 but 2.26% of GDP indicate for public debt (Jackson, 2010). Economic recovery happened in late 2009 and 2010, but the government was forced to make new economic contract because of the massive 9.0 magnitude earthquake.

In March 2011, all of nuclear power plants were destroyed. In addition, estimated direct costs ranged from $235 billion to $310 billion for rebuilding homes, factories, and infrastructure. In 2011, GDP declined almost by 0.5%, (World Fact Book, 2011).

In 2012, the Organization for Economic Cooperation and Development (OECD) announced that considerable percentage of GDP is assigned Japan's debt because of the earthquake and the reconstruction efforts. (Gurría 2012)

3.3 Trends in Indicators

This section will present Line plots of series under consideration of this study, which are at their natural logarithms. Graph (1) displays (FDI) standing for log of the ratio of the foreign direct investments to real GDP in Japan during years 1977-2011, and as it can be seen on this graph, it is highly fluctuating. In addition, there are some dramatic rises in the years 1984, 1989 and 2006, and also there are some sharp declines in the early 1978, 1993 and FDI was at the bottom in 1995.

The important reason of low level of this ratio is because of the lack of cross-border mergers and acquisition according to (Paprzycki & Fukao, 2008), also government policies influenced the outward Foreign direct investment, because of the limitation on import of barriers, supply decreased and due to raise in prices that caused domestic suppliers retire from producing, and furthermore low stock of inward Foreign direct investment is because of government policies against to inward Foreign direct investment and the second factor is because of the hardness of language for foreigners. (Flath, 2005). Net inflow of foreign direct investment as a percentage of GDP in Japan was announced at -0.03 in 2011 (Word Bank, 2012).

Graph (2) presents Ln GDP standing for log of the GDP, which is used as economic growth measurement, for the years 1977-2011. Basically, it has

growth efficiently during this period, and from the first year until 1990, it has increased gradually then it almost steady in following years. From 1981 to 2012 average of annual Growth rate is 2.1 percent and all the time more than 9.4 Percent (Word Bank, 2012).

Graph (3) shows lnM2 standing for log of the ratio of broad money to real GDP in Japan during 1997-2011. In addition, mostly during this period, Japan shows significant growth, and the most upward rise has occurred in 2000. Only in few years between 2001 and 2008, it suffered from deficiency, but in the latest years, it seems there is a rise again. From 1960 until 2012, average growth rate of money supply is 355432.2 (Word Bank, 2012).

Graph (4) considers Ln DC standing for log of the ratio of domestic credit provided by banking sector to real GDP, during years 1977-2011. In addition, in this period Japan shows upward trend in general and only starting from 1996 it shows some volatile movements with low drops in 1997, 2002, and 2008. However, as a whole, it has a considerable growth and domestic credit by banking sector in Japan was at 337.85 in 2011 (World Bank, 2012).

Graph (5) presents Ln DCP standing for log of the ratio of domestic credit, provided to privet sector to real GDP in Japan during 1977-2011, it is seen that in the beginning years until 1996 it has been gradually increased and follows a rapid climb and reaches its peak in 2000 and then it drops steeply and goes on with some downward fluctuation.

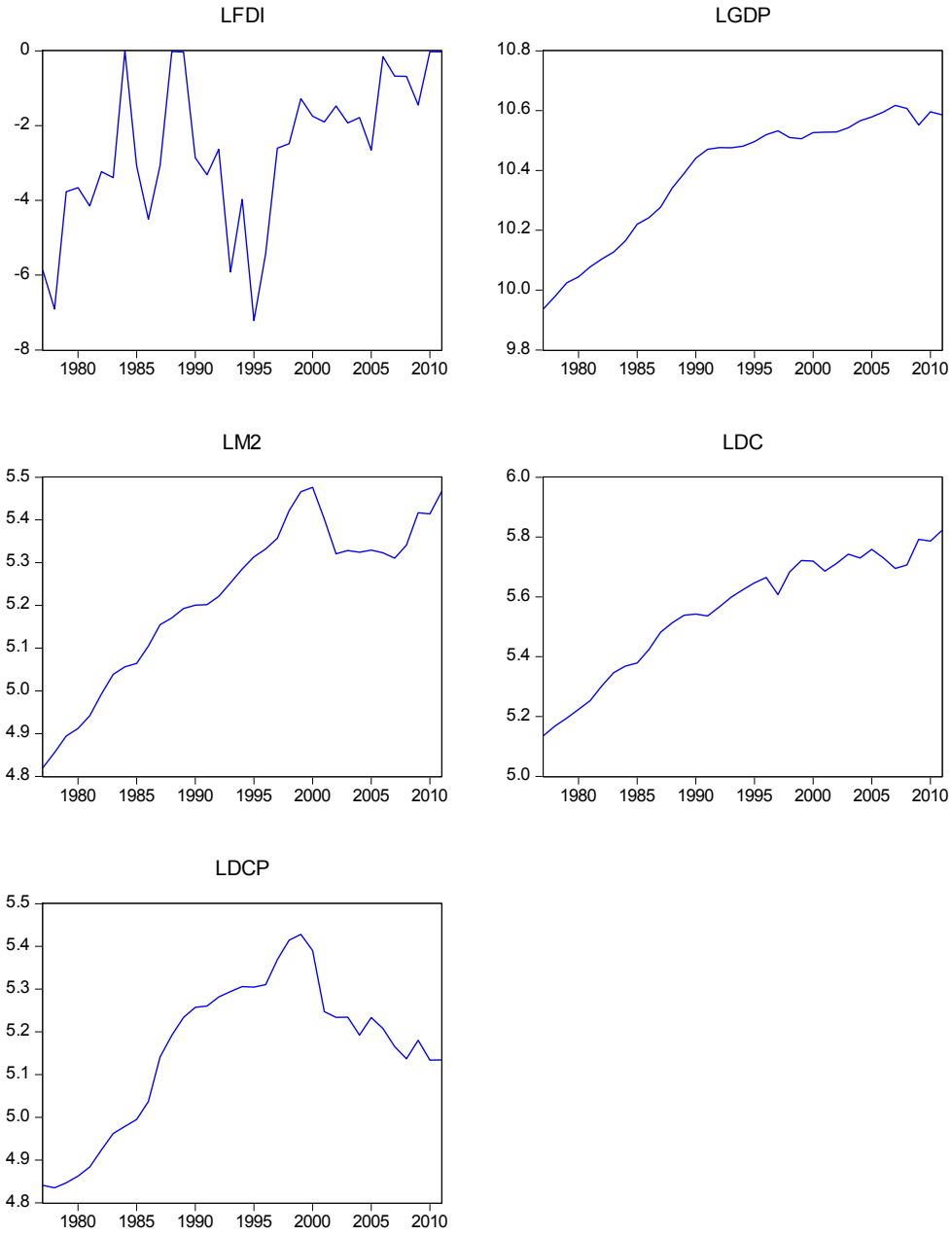

Figure1: Trends in indicators

Chapter 4

THEORETICAL SETTING

This thesis concentrates on the impact of the financial development and foreign direct investment on the economic growth in Japan by considering the variables that are constructed for explaining this relationship in following statistical interaction:

$$GDP_t=F\ (FD_t,\ FDI_t) \qquad (1)$$

In equation (1) GDP that stands for gross domestic products as a dependent variable is a function of FD that stands for financial development and FDI that stands for foreign direct investment as independent variables. It is expected that two regressors, FDI and FD, have a long-run impact on GDP.

FD indicator has been proxied by three separate variables in parallel to the literature (Jenkins and Katircioglu, 2010; Katircioglu and Kahyalar 2007): Domestic credits provided to private sector (DCP), domestic credits provided by overall banking sector (DC), money supply as a ratio of broad money to real GDP (M2).

Equation (1) can be rewritten at natural logarithms for estimating the growth effects in linear form: (Katircioglu, 2010):

$$\ln GDP_t = \beta_0 + \beta_1 \ln FD_t + \beta_2 \ln FDI_t + \varepsilon_t \quad (2)$$

Where ln GDP is the natural logarithm of real gross domestic product at period t; ln FD stands for the natural logarithm of financial development; ln FDI stands for the natural logarithm of foreign direct investment and ε stands for the error term in long term growth model (Katircioglu, 2010). Moreover, as it is obvious in equation (2), the expected sign of coefficients for lnFD and lnFDI is positive; these variables are expected to have positive impact on real gross domestic product.

In the next step, error correction model for speed of convergence of Ln GDP and short-term coefficients of Ln FD and Ln FDI will be estimated in equation (3) since it is possible that the contribution of the regressors cannot adjust the dependent variable to its long-term equilibrium value. (Katircioglu, 2010):

$$\Delta \ln GDP_t = \beta_0 + \sum_1^n \beta_1 \Delta \ln GDP_{t-j} + \sum_{i=0}^n \beta_2 \Delta \ln FD_{t-j} + \sum_{i=0}^n \beta_3 \Delta \ln FDI_{t-j} + \beta_4 \varepsilon_{t-1} + u_t \quad (3)$$

Where Δ is for a change in Ln GDP, Ln FD, and Ln FDI, ε_{t-1} stands for coefficient of error correction term (ECT) from equation (2). ECT coefficient in equation (3) shows how fast it could be in achieving to its long run level. In addition, coefficient of (ECT) is expected to be negative (Katircioglu, 2010).

Chapter 5

DATA AND METHODOLOGY

5.1 Data

This study used annual time series data, based on the year 2000 constant dollar prices for Japan for the period between 1977 and 2011. In addition, Eviews 6.0 was used as statistical software for analyzing the available data, which has been changed to their natural logarithm. All the data is gathered from World Bank Development Indicators (WDI) by the last updated data during this study that is done in the year 2011.

As mentioned in theoretical setting chapter, this study will estimate the impact of the foreign direct investment and financial development on economic growth, and the related variables of the study are: Ln GDP (dependent variable), Ln FD (independent variable), and Ln FDI (independent variable).

Financial Development is proxied by three variables as also suggested by Beck (2002); they are broad money (M2) as percentage of GDP; domestic credits provided by banking sector (DC) as percentage of GDP; and domestic credit provided to privet sector (DCP) as percentage of GDP all M2, DC, and DCP variables are in their natural logarithm in this study.

5.2 Unit Root Tests for Stationary Nature of Series

The first step, in order to determine the relationship between, foreign direct investment, and financial development with economic growth, is to check for the stationary or integration of non-stationary of time-series variables. This study used two common tests for determining the stationary nature of the variables: PP (Philips and Perron, 1988) and ADF (Dickey and Fuller, 1981).

According to unit root tests, some variables might be stationary at level that means they are integrated of order zero and have fixed covariance, variance and mean. Some variables might be non-stationary at levels but become stationary at first or second differences or even in more lags, In other words, data series can be stationary at I (0), I (1) or I (d). Three models will be used for unit roots in both ADF and PP test from the most general one including (trend and intercept) towards the most restrictive one (without trend and intercept).

Dickey and Fuller (1979) proposed that there is a simple first order autoregressive process for the underlying data. The most general model in the unit root test (including intercept and time trend) is based on the following equation:

$$\Delta y_t = a_0 + \gamma y_{t-1} + a_2 t + \sum_{i=2}^{p} \beta_j \Delta y_{t-i-1} + \varepsilon_t \quad (4)$$

In equation (4) y = series**;** t= time trend; a= constant term (intercept); ε_t is Gaussian white noise and p stands for the lag order. Choosing the number of the lags p can be done by various approaches such as the Akaike Information

Criteria (AIC) in order to be sure that errors are white noise. By dividing the estimate of γ to its standard error the ADF tests statistic is calculated and if it is bigger than the critical value the null hypothesis can be rejected, and **y** is said to be stationary.

Phillips and Perron (1988), on the other hand, create a test that is used as an alternative to the ADF unit root test in time series analysis that is appropriate for unspecified autocorrelation by computing residual variance, and this test is also used for making a nonparametric correction of γ coefficient to t-statistic by Auto Regressive regression in (ε_t) as serial correlation by Newey-West heteroscedasticity autocorrelation method of the form:

$$\omega^2 = \gamma_0 + 2 \sum_{j=1}^{q} (1 - \frac{j}{q+1}) \gamma_j \quad (5)$$

$$\gamma_j = \frac{1}{T} \sum_{t=j+1}^{T} \tilde{\varepsilon}_t \tilde{\varepsilon}_{t-j} \quad (6)$$

In equation (5), q is the truncation lag; in equation (6) γ_j stands as a covariance of estimated residuals j- lag; T stands for the sample size.

The Phillips and Perron T-statistic is computed as the following in equation:

$$t_{pp} = \frac{\gamma_0 \frac{1}{2} t_b}{\omega} - \frac{(\omega^2 - \gamma_0)\, T\, s_b}{2\omega\hat{\sigma}} \quad (7)$$

In equation (7), t_b, s_b, and σ are standing for t-statistic, standard error of β and error of the test regression respectively.

5.3 Zivot and Andrews Model

In addition to ADF and PP test, Zivot and Andrews (1992) Unit Root Tests will be also uses for comparison purposes. This test provide a sequential test that can examine the possible presence of the structural break by applying full sample and different variable for each possible break date. The break date will be chosen when t-statistic is most negative in the ADF test and results are least appropriate for unit root null hypothesis. The different critical values in Zivot and Andrews test (1992) in comparison with Phillips and Perron test (1988) assume that the chosen time of the break is considered as the outcome of an estimation procedure in this test.

Zivot and Andrews (1992) applies three models to test for a unit root: Model A, model B, that allow one-time change in the level of the series and in the slope of the trend function, respectively, also model C that combines model A and model B that means one-time change in the level and the slope of the trend function of the series. Three models is mentioned in following equations:

$$\Delta y_t = c + \alpha y_{t-1} + \beta t + \gamma DU_t + \sum_{j=1}^{k} d_j \Delta y_{t-j} + \varepsilon_t \quad \text{(ModelA)} \quad (8)$$

$$\Delta y_t = c + \alpha y_{t-1} + \beta t + \theta DT_t + \sum_{j=1}^{k} d_j \Delta y_{t-j} + \varepsilon_t \quad \text{(ModelB)} \quad (9)$$

$$\Delta y_t = c + \alpha y_{t-1} + \beta t + \theta DU_t + \gamma DT_t + \sum_{j=1}^{k} d_j \Delta y_{t-j} + \varepsilon_t \quad \text{(ModelC)} \quad (10)$$

5.4 The ARDL Approach for Long-run Relationship

After determining the stationary nature of the variables, the next step to test for any long run relationship between foreign direct investments, financial development, and economic growth. When variables become stationary at their level, it means they have natural long run relationship so there isn't any need for further tests, single regressions are estimated. However, if they are stationary at first or second level differences some further econometric methods are needed. Like co-integration test that was introduced by Engel and Granger (1987) and Johansen and Julius (1991). This test can define long run relationship in the variables that are integrated of the same order and cannot be helpful for the variables that are integrated in the mixed order (Katircioglu, 2009).

Another test that is used for investigating the long run relationship between variables is, bounds test that suggested by Pesaran et al (2001). This test compensate weakness of co-integration test by determining long run relationship even in the regressors that have a mixed order of integration, but not in the dependent variable. In this test dependent variable should be absolutely integrated of order one, and as it was suggested by (Pesaran, Shin & Richard, 2001)

In this thesis, ARDL (autoregressive distributed lag) approach for bound test that was developed by (Pesaran, Shin & Richard, 2001) is used. This test can be applied without considering the order of the integration, (they can be ordered zero, one, or mutually co-integrated). In the following equation ARDL

mechanism can be considered:

$$\Delta \ln GDP_t = a_{0r} + \sum_{i=1}^{n} b_{iy} \Delta \ln GDP_{t-i} + \sum_{i=0}^{n} c_{iy} \Delta \ln FDI + \sum_{i=0}^{n} d_{iy} \Delta \ln FD + \sigma_{1r} \ln GDP_{t-I} + \sigma_{2r} \ln FDI + \sigma_{3r} \ln FD + {}_{t-i} + \varepsilon_t \quad (11)$$

In equation (11), Ln FD and Ln FDI are the natural logarithms of independent variables of financial development and foreign direct investment respectively, and Ln GDP is the natural logarithm of dependent variable of gross domestic product.

At the end, scenarios III, IV, and V from five scenarios in F-test, that are proposed by (Pesaran, Shin & Richard, 2001) will be applied consisting with the works of Katircioglu (2010) and (2009), for testing the null hypothesis of no long run relationship between variables, (H_0: $\sigma_{IY} = \sigma_{2Y} = \sigma_{3Y} = 0$) and alternative hypothesis of a long run relationship, ($H_{1:}$ $\sigma_{IY} \neq \sigma_{2Y} \neq \sigma_{3Y} \neq 0$).

5.5 Long Run Equations and Error Correction Models

After confirming existence of long run relationship in equation (2) the level equation and ECM of long run relationship in this equation should be estimated. The ECM model will be estimated under the ARDL approach as given below:

$$\Delta \ln GDP_t = \Delta \beta_0 + \sum_{j=1}^{p-i} \emptyset_j \Delta \ln GDP_{t-j} + \sum_{i=1}^{k} \beta_{Io} \Delta \ln x_{it} + \sum_{i=1}^{k} \sum_{j=1}^{q-1} \beta_{ij} \Delta x_{i,t-j} + \varphi \Delta z_t + \gamma (1,p) ECT_{t-1} + u_t \quad (12)$$

In this equation, coefficients for the short- run period are:$\emptyset_j$, φ and β_{ij}. The coefficient of error correction term that should be negative is γ (1,p). In

addition, x stands for independent variables, Ln FDI and Ln FD respectively.

CHAPTER 6

DATA ANALYSIS AND EMPIRICAL RESULTS

6.1 Unit root Tests for Stationary

This section provides the results of ADF and PP unit root tests for the stationary nature of variables under consideration.

As it is presented in Table 1, for all variables including natural logarithmic format of real Gross Domestic Product (Ln GDP), money supply (Ln M2), domestic credit provided by banking sector (Ln DC), domestic credit provided to private sector (Ln DCP) and foreign direct investment (Ln FDI), both ADF and PP test statistics were run at levels and first differences. Furthermore, both tests were applied in three models: (τ_T) is the most general model with a trend and intercept; (τ_M) is the model with an intercept and without trend and (τ) is the most restricted model without trend and intercept (Enders, 1995).

Furthermore, because the number of observations is less than 50, it is considered as small size, so the maximum lag length that can be set, is five lags in dependent variable (Katicioglu, 2009). The null hypothesis, H (0), states the non-stationary of variable and alternative hypothesis, H (1), states the statinariy nature of variable.

The following results have been obtained from Table (1) that contains the analysis of ADF and PP tests:

Table (1) provides mixed results of unit root tests. When Ln GDP and Ln DC are considered, the null hypothesis of a unit root cannot be rejected but can be rejected when trend variable is omitted. However, as can be also seen from figure 1, Ln GDP is likely to contain trend and this trend is statistically significant in both ADF and PP tests. Therefore, trend variable should not be eliminated in unit root test (see Endres, 1995). On the other hand, when the first difference of Ln GDP and Ln DC are taken, it is seen that the null hypothesis of a unit root can be rejected according to three models of ADF and PP tests, therefore, this is to conclude that Ln GDP of Japan is said to be integrated of order one, I (1).

Table (1) shows that the null hypothesis of a unit root test cannot be rejected in any model of both ADF and PP tests in the cases of Ln M2 and Ln DCP at their levels but can be rejected at first differences; there for, it is concluded that, Ln M2 and Ln DCP of Japan are also integrated of order one, I (1).

Finally Table (1) shows different results for Ln FDI in Japan, it is clearly seen that the null hypothesis of a unit root can be rejected in three models of ADF and PP tests at both levels and first differences of Ln FDI; therefor, it is concluded that Ln FDI is integrated of order zero (0), I (0).

To summarize, results of present study revel that Ln GDP, Ln M2, Ln Dc, and Ln DCP in Japan are integrated of order one, I (1), while Ln FDI is integrated of order zero , I (0).

Table 1: ADF and PP tests for unit Root

Statistics (Level)	ln GDP	Lag	ln M2	Lag	Ln DC	Lag	ln DCP	Lag	ln FDI	Lag
τ_T (ADF)	-0.79	(0)	-2.19	(1)	-1.90	(0)	-0.35	(0)	-3.47***	(0)
τ_μ (ADF)	-3.94*	(0)	-1.53	(1)	-2.10	(0)	-2.09	(1)	-2.94***	(0)
τ (ADF)	4.50	(0)	1.69	(1)	-3.80	(0)	-0.73	(1)	-2.10**	(0)
τ_T (PP)	-0.82	(1)	-1.64	(0)	-1.73	(4)	-0.48	(1)	-3.45***	(1)
τ_μ (PP)	-3.71*	(2)	-1.94	(1)	-5.98*	(3)	-1.86	(2)	-2.85***	(1)
τ (PP)	3.04	(4)	2.61	(2)	4.12	(4)	0.83	(3)	-2.01**	(5)
Statistics (First Difference)	ln GDP	Lag	ln M2	Lag	ln DC	Lag	ln DCP	Lag	ln FDI	Lag
τ_T (ADF)	-5.09*	(0)	-3.34***	(0)	-5.97*	(0)	-4.51*	(0)	-7.38*	(0)
τ_μ (ADF)	-3.82*	(0)	-3.36***	(0)	-5.64*	(0)	-3.78*	(0)	-7.48*	(0)
τ (ADF)	-3.00*	(0)	-2.78*	(0)	-4.17*	(0)	-3.71*	(0)	-7.47*	(0)
τ_T (PP)	-5.09*	(0)	-3.15	(5)	-10.65*	(3)	-4.41*	(4)	-9.01*	(2)
τ_μ (PP)	-3.86*	(3)	-3.22**	(4)	-5.66*	(5)	-3.77*	(2)	-9.32*	(2)
τ (PP)	-2.88*	(3)	-2.68*	(3)	-4.14*	(2)	-3.70*	(2)	-8.49*	(9)

Note: All of the series are at their natural logarithms. τ_T, τ_μ, and τ respectively stands for the most general model, a model without trend, and the most restricted model without trend and intercept. Optimum lags have been selected based on the suggested criteria by ADF and PP approaches. *, ** and *** stands for the rejection of the null hypothesis respectively at alpha 1%, 5% and 10% levels. Analyses have been done in E-VIEWS 6.0

6.2 Zivot-Andrews Test

In addition to the critical ADF and PP tests, Zivot Andrews, (ZA) unit root tests (Zivot and Andrews, 1992) have been also run for comparison purposes that take structural breaks in to consideration. This test includes three models, those are: Model A, Model B and Model C. Each model has specific critical values at 1 percent, 5 percent and 10 percent significance level, that they are 4.24, -4.80 and -5.34 for model A; -4.93, -4.42, -4.11 for Model B; and -5.57, -5.08 and 4.82 for Model C. If T-value of ZA test is greater than the critical value, the null hypothesis of a unit root test can be rejected. Then that variable is said to be integrated at level, I (0), by contrast, if T-value is less than critical value, variable is integrated of order one, I (1). This comparison should be performed for all the three models (model A, model B and model C). Table (2) gives Zivot-Andrews (1992) unit root test results with this respect:

It is seen in model (a) that GDP, DC, and DCP are not statistically significant; therefor, we cannot reject the null hypothesis of a unit root for these series. On the other hand, FDI and M2 are statistically significant at 0.01%; therefor the null hypothesis of a unit root is rejected in the case of FDI and M2. This is to conclude that GDP, DC, and DCP are non-stationary at levels but become stationary at first differences while FDI and M2 are stationary at levels.

In addition, as it can be considered in model (b) all variables are not statistically significant at level but become stationary at first difference. In Model (c), DC, DCP, M2 and GDP are not statistically significant at levels but

become stationary at first differences but FDI is statistically significant at 0.10%;

Results of ZA (1992) tests have provided different conclusions than ADF and PP tests. Therefor, final conclusion is that GDP, DC, DCP are integrated of order one (I), while FDI and M2 are integrated of order zero I (0) in Japan.

Table 2: Zivot-Andrews

MODEL (A)

Variables	LGDP	LDC	LDCP	LFDI	LM2
t-stat	-2.535	-2.937	-2.704	-4.884	-6.771
Lag	0.000	0.000	0.000	1.000	0.000

MODEL (B)

Variables	LGDP	LDC	LDCP	LFDI	LM2
t-stat	-4.103	-3.769	-3.784	-3.817	-3.211
Lag	0.000	0.000	1.000	1.000	1.000

MODEL (C)

Variables	LGDP	LDC	LDCP	LM2	LFDI
t-stat	-4.598	-3.792	-3.167	-3.319	-4.821
Lag	0.000	0.000	0.000	0.000	0.000

6.3 Bound Tests for Long Run Relationships

After running Unit root tests, In order to investigate the long run relationship between GDP and its regressor, this study applies bound tests that suggested by Pesaran et al. (2001) based on F- tests. The advantage of bounds tests is that regressors, can be in the mixed order of integration. In addition, three scenarios: $F_{III,}$ F_{IV} and F_V with three models (a), (b) and (c) have been considered, and the results of bounds test table will be mentioned in the following:

Table (3) shows that the null hypothesis of no long run relationship can be rejected in equation (1) when gross domestic product is dependent variable and foreign direct investment and money supply are regressors, according to computed F ratios in (F_{III}) and (F_{IV}) scenarios, that are greater than upper limits. So that means it is conclusive, in case of japan.

Equation (2) shows that the null hypothesis of no long run relationship can be rejected when gross domestic product is a dependent variable and Foreign direct investment and Domestic credit in privet sector are regressors, according to computed F ratios in (F_{III}) and (F_{IV}) scenarios, that are greater than upper limits.

Equation (3) shows that null hypothesis can be rejected when gross domestic product as a dependent variable has a long run relationship with Foreign direct investment and Domestic credit as regressors, according to computed F ratios in (F_{III}) and (F_{IV}) scenarios, that are greater than upper limits, that means this model is conclusive.

Equation (4) shows that null hypothesis can be rejected when domestic credit as a dependent variable has a long run relationship with gross domestic product and foreign direct investment as regressors, according to computed F ratio in (F_{III}) scenario that is greater than upper limit, that means this model is conclusive.

Equation (5) shows that gross domestic product as a dependent variable has long run relationship with foreign direct investment, domestic credit, domestic credit in privet sector and money supply as regressors, so the null hypothesis can be rejected because, computed F ratio in (F_{III}) and (F_{IV}) scenarios are greater than upper limits, that means this model is conclusive.

Equation (6) shows that domestic credit to privet sector as dependent variable has a long run relationship with gross domestic product and foreign direct investment as regressors, so the null hypothesis can be rejected because, computed F ratio in and (F_{IV}) scenario is greater than upper limit, that means this model is conclusive.

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Table 3: The Bounds Test for Level Relationships

Variables	With Deterministic Trends		Without Deterministic Trends	Conclusion
	F_{IV}	F_V	F_{III}	
				H_0
1.Lngdp= f (ln fdi, ln m2)				
				Rejected
p = 1	6.002*	0.84	7.17*	
2	1.89	0.72	2.32	
3	1.94	1.08	1.69	
4	1.29	0.47	1.80	
2. lnGdp = f (ln fdi, lndcp)				
				Rejected
p = 1	4.84*	1.06	6.43*	
2	1.51	0.60	2.10	
3	1.35	0.98	1.88	
4	1.54	1.11	1.91	
3. lnGdp = f (ln fdi, lndc)				
				Rejected
p = 1	15.10*	6.04*	12.65*	
2	3.01	2.51	2.22	
3	1.40	1.86	1.54	
4	4.43	5.90	6.29*	

Table 3: The Bounds Test for Level Relationships (continued)

Variables	With Deterministic Trends		Without Deterministic Trend	Conclusion
	F_{IV}	F_V	F_{III}	
				H_0
4. DC= f (GDP, FDI)				
				Rejected
p = 1	3.56	0.75	4.85*	
2	2.68	1.04	3.70	
3	1.48	0.88	2.04	
4	1.52	1.07	2.10	
5. Gdp = f (fdi, dcp, dc, m2)				
				Rejected
p = 1	_	7.29*	16.47*	
2	_	2.86	3.43	
3	_	1.98	2.18	
4	_	2.50	2.24	
6.DCP= f (GDP, FDI)				
				Rejected
p = 1	4.88*	3.28*	1.37*	
2	3.79	3.58	1.92	
3	1.37	1.47	1.27	
4	1.76	1.74	1.97	

6.4 Level Equation and Error Correction Models

In This study long run relationship has been investigates between repressors by bound test. Next step is to estimate level equation and ECM As it can be seen, table (4) presents the summery of conditional Error Correction Models and Level coefficient under the ARDL approach and Probability in ECM and level equation should be less than 1 %, 5 % and 10 % and ECM should be negative and less than one.

In the case of the first model, it is seen that GDP converges to its long-term level by -40.93 percent through the channels of FDI and domestic credits by banking sector. And long-term coefficient of domestic credit by banking sector is 1.1574 that it is statistically significant at % 0.01, it means that one percent change in DC will lead to 1.1574 percent change in GDP in the same direction. The level coefficient of FDI is -0.004174 that it is statistically significant.

In the second model, it is seen that GDP converges to its long-term equilibrium level at -53.33 percent through the channels of FDI and DCP. And Long-term coefficient of FDI and DCP are 2.839 and 4.434 respectively that which are statistically significant at 0.10 %, it means one percent change in these variables can lead to 0.0283 and 0.443 percentage change in the GDP in the same direction.

In the third model: GDP converges to its long-term level at -14.09 percent. Long-term coefficients of FDI and M2 are -21.78 and -97.35 respectively,

while are not statistically significant, that means any changes in these variables cannot lead to any changes in the GDP.

In the fourth model: GDP converges to its long-term level at -27.69 percent by contribution of money supply, foreign direct investment, domestic credits by privet sector and domestic credit by banking sector. Long-term coefficient of money supply and domestic credit by banking sector are -87.64 and 1.7006 percent respectively which are statistically significant at % 0.01, it means that one percent change in M2 and DC will lead to -87.64 and 1.7006 percent change in GDP in the same direction. In addition, the level coefficient of FDI and DCP are 0.64 and 0.23 that they are not statistically significant.

In the fifth model: DC converges to its long-term level at -61.2 percent. Long-term coefficient of GDP and FDI are -40.81 and 1.67 which are not statistically significant and will not lead to any changes in DC. In the sixth model: DCP converges to its long-term level at -31.17 by the contribution of GDP and FDI. Long-term coefficient of GDP is 1.6858 percent, which is statistically significant 0.01 percent, that means one percent change in GDP, will lead to 1.6858 percent change in DCP, and the level coefficient of FDI is 0.007365 that is not statistically significant.

Table 4: Level Coefficients and ECM Regressions

Null Hypothesis	Distributed Lags	ECM Coefficient	Level Coefficient
GDP=F (fdi, dc)	5,1,3	-0.4093*	1.1574*dc 0.0417 fdi
GDP=F (fdi, dcp)	5,1,3	-0,0533*	0.0283***fdi 0.443 ***dcp
GDP= F (fdi, m2)	5,1,3	-0.1409*	0.2178 fdi -0.9735 m2
GDP= F (fdi, dc, dcp, m2)	5,1,3	-0.2769*	-0.8764*m2 1.7006*dc 0.0064 fdi 0.2333 dcp
DC= F (gdp, fdi)	5,1,3	-0.0612*	-0.4081*** gdp 0.0167 fdi
DCP=F (gdp, fdi)	5,1,3	- 0.3117*	1.6858* gdp 0.007 fdi

Chapter 7

CONCLUSION

7.1 Conclusion

Japan still is one of the largest economies in the world however; twenty percent of the world's earthquakes take place in Japan and caused remarkable debts for reconstruction, (BBC News, 2012).

In this study, any short-run and long run relationship and effect of the Foreign Direct Investment and Financial Development as dependents variables and real income growth as independent variable in Japan is investigated.

As it mentioned before financial development has been proxied by three separate variables that According to the figures in chapter three, all these variables: DC, DCP, M2, shows the upward trend from 1977, and that indicate the effect of the financial development on economic growth of Japan, and FDI shows the fluctuating movements, with sharps declines that the reasons has been uttered in chapter three.

Regressors, FDI and FD are analyzed by further econometric models like: Unit root test and Zivot-Andrews test for determining stationary nature of variables, Bounds test for indicating any long run relationship, and finally Error

correction models for showing any long run and short run relationship for annually data between 1977 until 2011.

Unit root tests and Zivot-Andrews test that both applied for indicating stationary nature of variables provided different conclusions in compare with each other, and because these tests showed that variables are integrated in mixed order, so Bound tests and Error correction model for further analyses have been applied.

Results of bound tests confirmed the existence of long run relationship between economic growth as dependent variable and foreign direct investment and financial development as independents variables, and also between the financial development as dependent variable and economic gross and foreign direct investment as independent variables.

Error correction models also indicate, the effective short run and long run relationship between financial development and economic growth as it mentioned in chapter 6, GDP converges to its long-term level by - 40.93 percent through the channels of FDI and domestic credits by banking sector, and GDP converges to its long-term equilibrium level at -53.33 percent through the channels of FDI and DCP, also In the third model: GDP converges to its long-term level at -14.09 percent through the channels of FDI and M2, In the forth model: GDP converges to its long-term level at -27.69 percent by contribution of money supply, foreign direct investment, domestic credits by privet sector and domestic credit by banking sector. In the fifth model: DC converges to its long-term level at -61.2 percent by contribution of GDP and

FDI, in the sixth model: DCP converges to its long-term level at -31.17 by the contribution of GDP and FDI

7.2 Recommendations

This study investigated the long run impact of financial development on economic growth so this study suggests that government and stockholders should encourage the financial systems for simplifying the trading and exchange of goods and services, mobilizing savings as is suggested by (Levin, 1997) and also because of the political limitation on import and export of the barriers as it suggested by(Flath, 2005) and also hardness of language for foreign investors as it mentioned in chapter three FDI couldn't improve really well so the government can change the rules for proving the foreign direct investment and also encouraging the domestic suppliers for providing the goods and exporting them , so as a result of improving FDI , GDP can growth more.

7.3 Limitations of the Study and Further Research

This study used annual data for Japan between 1977-2011, that it depends on data availability so further research can be done for more periods, and also as it is mentioned in literature review there are so many studies about the effect of FD on real gross domestic product, but less studies have been done for analyzing the effect of the FDI on GDP and also for analyzing the relationship between FDI and FD, and the effects of two of them on GDP, So further researches can be applied in this area in different countries.

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