ANALYSIS OF THE CO INTEGRATION OF ASEAN STOCKS MARKET BY APPLYING ARDL APPROACH 1990. i – 2004.ii

A THESIS

Presented as Partial Fulfilment of the Requirements To Obtain the <u>Bachelor Degree</u> in Economics Department



Iqbal Himawan Student Number: 03 313 070

DEPARTMENT OF DEVELOPMENT ECONOMICS INTERNATIONAL PROGRAM FACULTY OF ECONOMICS UNIVERSITAS ISLAM INDONESIA YOGYAKARTA 2007

ANALYSIS OF THE CO INTEGRATION OF ASEAN STOCKS MARKET BY APPLYING ARDL APPROACH 1990. i – 2004.ii



Language Advisor,

Norman Kurnianto Soejoeti, S.E., M.Si

September, 2007

ANALYSIS OF THE CO INTEGRATION OF ASEAN STOCKS MARKET BY APPLYING ARDL APROACH 1990.i – 2004.ii

A BACHELOR DEGREE THESIS

By

IQBAL HIMAWAN

Student Number: 03 313 070

Defended before the Board of Examiners On September 27, 2007 And Declared Acceptable

Board of Examiners

Examiner 1/Content Advisor

Akhsyim Afandi, Drs., MA

Examiner 2

Jaka Sriyana, Dr., SE., M.Si

Yogyakarta, September 27, 2007 International Program sisFaculty of Economics (highersity of Indonesia slamic an k, Drs., M.Bus, Ph.D

Acknowledgement

Thank you to Allah SWT for showing me to never lose faith, when I almost did. When having the hard times in my life, God answered my prayers and turned everything around.

Thank you to Mr. Asmai Ishak, the Director of Economics Faculty of Universitas Islam Indonesia.

To Mr. Akhsyim, thank you so much for being the believer and paving the way for my thesis. Thank you for all the support, for being there, and for all those inspiration and precious knowledge. Thank you to Mr. Norman as my thesis language advisor.

To My Mother, father, and brother, thank you for your encouraging words to never give up.

To my best friend, Novry, Dannia, and Bagus, thank you for being the strength for me. You have been a blessing in my life. You are the rock that has kept me together. To mas Akbari, Yusuf, and Robbie, thank you for the encouragement that you have given to me throughout our times together. Anin, thank you for your sincere wish. None of this would be possible without your support.

Hopefully this thesis can give contributions and benefits for others.

Yogyakarta, September 2007 Iqbal Himawan

TABLE OF CONTENTS

PAGE OF TITL	Ε	i			
APPROVAL PA	.GE	ii			
LEGALIZATION PAGE					
ACKNOWLEDGEMENTS					
TABLE OF CON	NTENTS	v			
LIST OF TABLE	ΞS	viii			
LIST OF FIGUR	ES	iv			
LIST OF APPEN	JDICES	v			
ABSTRACTS (I	n English)	vi			
ABSTRACTS (I	n Indonesian)	xii			
CHAPTER I	INTRODUCTION	1			
	1.1. Background Of The Study	1			
	1.2. Problem Identification	4			
	1.3. Problem Formulation	4			
	1.4. Problem Limitation	5			
	1.5. Research Objectives	5			
	1.6. Research Contribution	5			
	1.7. Definition of Terms	6			
	1.8. Organization of Thesis	7			
CHAPTER II	ASEAN CAPITAL MARKET OVERVIEW	9			
	2.1. Asean Capital Market	9			
	2.1.1. Indonesian Capital Market	9			
	2.1.2. Malaysia Capital Market	10			
	2.1.3. Philippine Capital Market	10			
	2.1.4. Singapore Capital Market	12			
CHAPTER III	REVIEW OF RELATED LITERATURE	13			
	3.1. Literature Review	13			
	3.1.1. Daryono Soebagiyo and Endah Heni Prasetyowati	13			
	3.1.2. Riní Dwi Astuti	13			
	3.1.3. Desak Putu Suciwati and Mas'ud Machfoeds	14			
	3.1.4. Osamah Al-Khazali, Ali F.Darrat, and Mohsen Saad	14			
CHADTED IV					
CHAFIERIV	THEORETICAL FRAMEWORK	20			
	4.1. Theoritical Background	20			
	4.1.1. Market Integration	20			
	4.1.2. Measuring Financial Integration	21			
	4.1.3. Indicators of Market Integration	24			
	4.1.2. Why Using Stock Price Index as Indicators of Stock				
	Market Co Integration?	27			
	4.1.0. Weighting	28			
	4.2. Hypotnesis Formulation	29			

CHAPTER V	RESEARCH METHOD	. 31		
	5.1. Introduction	. 31		
	5.2. Research Method	31		
	5.3. Research Subject	32		
	5.4. Research Variables	32		
	5.5. Technique of Data Analysis	32		
	5.5.1. Stationary tests	32		
	5.5.2. Johansen Cointegration Test	34		
	5.5.3. ARDL Approach	35		
	5.5.4.1. Bound Test	36		
	5.5.5. Diagnostic Test	38		
	5.5.6. Coefficient Stability Test	38		
	C DEAM X			
CHAPTER VI	DATA ANALYSIS	40		
	6.1. Introduction	40		
	6.2. Data Analysis			
	6.2.1. Unit Root Test ADF	41		
	6.2.2. Johansen Cointegration Test	43		
	6.3. Autoregressive Distributive Lag	43		
	6.2.1. ARDL Based Cointegration Test	44		
	6.2.2. The Long Run Stock Market Cointegration Relation	46		
	6.2.3. Diagnostic Test	50		
	6.2.4. Coefficient Stability Using CUSUM Square	53		
CHAPTER VII	CONCLUSIONS AND IMPLICATIONS	57		
	7.1. Conclusions	57		
	7.2. Implication	57		
BIBLIOGHRAPHY				
APPENDIX		60		

LIST OF FIGURES

CUSUM test of INA (ARDL based on AIC)	53
CUSUM Square test of INA (ARDL based on AIC)	53
CUSUM test of MLY (ARDL based on AIC)	54
CUSUM test of PHIL (ARDL based on AIC)	54
CUSUM Square test of PHIL (ARDL based on AIC)	55
CUSUM test of SNG (ARDL based on AIC)	55
CUSUM Square test of SNG (ARDL based on AIC)	55



LIST OF APPENDICES

Table of Indonesian, Malaysian, the Philippine, and Singapore Stock Price Index (in Log)

Unit root test (E-Views) result

Johansen co integration test result

Table of co integration relation

Bound F Statistic test result

ECM of Indonesia, Malaysia, the Philippine, and Singapore (lag 4)



ABSTRACT

Iqbal Himawan (2007), "Analysis of the Co Integration of ASEAN Stock Market by applying ARDL Approach, 1990. i – 2004.ii". Faculty of Economics, Developmental Economics Studies, International Program, Islamic University of Indonesia, Yogyakarta.

This study seeks to examine the dynamic interactions of stock price indices in four ASEAN countries, Indonesia; Malaysia; the Philippines; and Singapore, with particular attention to the 1997 Asian financial crisis and period onwards. Using quarterly time series data of the stock price indices countries, a Johansen co integration test is employed to empirically examine the interaction among the variables.

The finding is that the four ASEAN stock market prices were found to be integrated during the sample period, and the Auto Regressive Distributive Lags (ARDL) shows the short run dynamic interactions among those stock markets. The important implication might be drawn from the finding is that portfolio diversification across the four ASEAN stock markets is unlikely to reduce investment risk due to high degree of financial integration of these markets.

ABSTRAKSI

Iqbal Himawan (2007), "Analysis of the Co Integration of ASEAN Stock Market by applying ARDL Approach, 1990. i – 2004.ii". Fakultas Ekonomi, Ilmu Ekonomi Studi Pembangunan, Program Internasional, Universitas Islam Indonesia, Yogyakarta.

Studi ini bertujuan meneliti interaksi dinamis antara indeks harga saham yang terdapat di empat negara ASEAN, yaitu Indonesia, Malaysia, Filipina, dan Singapura, yang terjadi selama masa krisis finansial Asia tahun 1997 dan periode sesudahnya. Dengan menggunakan data time series empat bulanan indeks harga saham dari keempat negara tersebut selama periode penelitian, suatu tes kointegrasi Johansen diaplikasikan untuk meneliti secara empiris interaksi dinamis yang terjadi diantara berbagai variabel yang dipergunakan dalam penelitian ini.

Dari hasil penelitian ditemukan kointegrasi antar pasar saham selama masa penelitian, dan analisa Auto Regressive Distributive Lags (ARDL) menunjukan adanya interaksi dinamis jangka pendek diantara pasar saham tersebut. Implikasi penting yang mungkin perlu diperhatikan dari penemuan ini adalah bahwa diversifikasi portofolio saham pada empat pasar saham tersebut agaknya tidak akan secara signifikan mengurangi tingkat resiko investasi. Hal ini dikarenakan oleh tingginya tingkat integrasi diantara pasar saham tersebut.

CHAPTER I

INTRODUCTION

1.1.Background of the Study

The rapid development of the capital market, especially in terms of company stock transactions has opened up a brand new way of operating in financial markets in ASEAN countries. Before the development of the overall capital market banking systems dominated this market, because when companies needed funds for their operational costs, for both the short and long term, they tended to obtain them from banks.

Other than banks, the capital market is represented by the stock exchange market, which is considered a place to gain relatively cheap additional capital. It has become one favorable alternative way for companies looking for funds through going-public, both by issuing stocks and obligations (Keller, Shiue, 2004)

In that case, companies will obtain direct benefits from the rapid growth of the stock market by "going-public". This option has been implemented by companies throughout ASEAN countries. It is obvious that companies that have gone public significantly improved compared with those which have not.

Members of the Association of Southeast Asian Nations (ASEAN) have recently made progress in forming a free trade area and investment zone, and are now examining the possibility of stock market integration. Regional integration may be fostered by simply coordinating existing national stock markets or, at an extreme, by creating a supranational exchange. Financial theory suggests that an integrated regional market is more efficient than segmented national markets, and this is what's driving the interest in ASEAN stock market integration. From the perspective of a portfolio investor, integration of markets suggests that the separate markets move together and have high correlations, so there is less benefit from portfolio diversification across countries. The issue of stock market integration is thus of interest to ASEAN policymakers and international portfolio investors alike.

This paper examines stock market integration in Indonesia, Malaysia, the Philippines, and Singapore. These four countries, along with Thailand, are the original members of the Association of Southeast Asian Nations (ASEAN), which now also includes Brunei, Cambodia, Laos, Myanmar, and Vietnam. Over the past few years, ASEAN member countries have made tremendous progress in forming a free trade area and investment zone - witness the ASEAN Free Trade Area (AFTA) and the ASEAN Investment Area (AIA). They are now examining the possibility of capital market integration for national bond markets and stock markets alike.

The stock markets of the ASEAN-4 countries generally have market capitalizations in line with the sizes of their economies. Singapore and Malaysia have market capitalizations as a percent of gross domestic product quite similar to the United States; 165.7% and 130.4%, respectively, versus 153.5% for the U.S. The Philippines, where stock market capitalization is 69.9% of GDP, is quite similar to the level of Japan, at 65.2%. Indonesia is the smallest markets, at 17.5%, respectively, but not out of line with emerging markets around the world. (Cerny, 2004)

These figures suggest that there is a general level of equity market development which may be conducive to integration. In contrast, the stock markets of Brunei, Cambodia, Laos, Myanmar, and Vietnam are either under-developed or non-existent. The four original ASEAN countries are the most likely candidates to undertake integrative measures first and therefore provide the focus for this paper.

The issue is integration, as opposed to stock market development more generally, although one motivation for integration is typically to foster development of the market. Interest in stock market integration arises because an integrated regional stock market is more efficient than segmented national capital markets. (W'alti, 2006)

Capital market efficiency in Southeast Asia has become even more important after of the Asian financial crisis of 1997-1998, as countries seek to reduce the traditional dependence of firms on bank loans rather than bond and stock issuances, at the same time that they seek new capital from outside the region. With an integrated regional stock market, investors from all member countries will be able to allocate capital to the locations in the region where it is the most productive.

With more cross-border flows of funds, additional trading in individual securities will improve the liquidity of the stock markets, which will in turn lower the cost of capital for firms seeking capital and lower the transaction costs investors incur.

These suggest a more efficient allocation of capital within the region. An integrated regional stock exchange will also be more appealing to investors from outside the region, who would find investment in the region easier or more justifiable. As shares become more liquid and transaction costs fall, fund managers become increasingly willing to take positions in the stocks. In addition, outside investors may take notice of the regional stock exchange instead of dismissing a collection of small national exchanges: the whole (one regional stock exchange) might be greater than the sum of the parts (individual country exchanges).

Based on the background above the writer's purpose is to use ASEAN stock market as the object of this research with the title: "ANALYSIS OF THE CO INTEGRATION OF ASEAN STOCKS MARKET BY APPLYING ARDL APPROACH, 1990.i-2004.ii".

1.2.Problem Identification

This research will focus on the co integration of ASEAN stock markets. This includes the stock markets of the four ASEAN member countries. We want to find out whether the ASEAN stock markets are integrated. For example if there is a fluctuation in Stock Price Index of one of the ASEAN countries, would this change affect on the overall ASEAN stock market?

1.3.Problem Formulation

Based on the study background, we formulate the following problems:

- 1. Are the ASEAN stock markets integrated?
- 2. Which of the ASEAN stock markets are strongly integrated?

1.4.Problem Limitation

This paper specifically considers whether the stock markets of Indonesia, Malaysia, the Philippines, and Singapore are currently co integrated. We examine a particular period of time, in order to consider the recent experiences of the ASEAN markets rather than a long history.

1.5.Research Objectives

The main purposes of this study are:

- 1. To examine whether the ASEAN stock markets are integrated.
- 2. To determine which of the ASEAN stock markets are strongly integrated.

1.6.Research Contribution

1. Writer

This research can give positive contributions for the writer, mainly concerning knowledge of the co integration of ASEAN stock markets, the data of which has been provided by each ASEAN countries' statistical centre. This research paper also provides the writer with the opportunity to practice systematic analytical thought.

2. Other Parties

This research will be useful for other parties who want to conduct further research. It can be a reference for them in making their report.

3. Requirement

As the partial fulfillment of the requirements in order to obtain the Bachelor Degree in International Program of the Faculty of Economics, Universitas Islam Indonesia.

1.7.Definition of Terms

The following describes the definition of terms used in this research and the title of this thesis in order to have clear understanding.

1. Capital Market

A financial market that trades bonds, stocks, or any other long-term financial instruments used by businesses to raise funds. The term "capital" comes from the notion that business commonly gets their funds to finance investment in capital from these markets.

2. Stocks

A supply of money that a company has raised. This supply comes from people who have given the company money in the hope that the company will make their money grow.

3. Stock Market

The market in which shares are issued and traded either through exchanges or over-the-counter markets. Also known as the equity market, it is one of the most vital areas of a market economy as it provides companies with access to capital and investors with a slice of ownership in the company and the potential of gains based on the company's future performance. 4. The Foreign Exchange Rate

The price at which one country's currency exchanges for the currency of another country.

5. Capital Loss

The decrease in the value of an investment or asset.

6. Capital Gain

The amount by which an asset's selling price exceeds its initial purchase price. A realized capital gain is an investment that has been sold at a profit. An unrealized capital gain is an investment that hasn't been sold yet but would result in a profit if sold. Capital gain is often used to mean realized capital gain. For most investments sold at a profit, including mutual funds, bonds, options, collectibles, homes, and businesses, the IRS is owed money called capital gains tax

7. Efficient markets theory

The application of rational expectations to the pricing of securities in financial markets.

1.8. Organization of Thesis

Chapter I

This chapter explains the reason for choosing the co integration of ASEAN stock market as the topic of this thesis, and the way to analyze the model.

• Chapter II

Describe the overview of ASEAN stock market condition.

Chapter III

This chapter reviews previous research about stock market co integration.

Chapter IV

This chapter explains theories as a fundamental basic to this thesis, i.e. the co integration of stock market.

• Chapter V

This chapter explains the research methods to use in data analysis.

• Chapter VI

This chapter is the core of this thesis; it includes data analysis and data testing.

Chapter VII

This chapter consists of the conclusion and discussion of the implications.



CHAPTER II

ASEAN CAPITAL MARKET OVERVIEW

2.1 ASEAN Stocks Market

This Chapter provides background information on several major ASEAN stock exchanges. Apart from being large, and therefore important, these markets differ substantially in their structure, their surrounding financial industry, and the legal environment. With regard to each market, we provide some basic information, particularly on its international activity.

2.1.1. Indonesian Capital Market

The capital market became an alternative source of relatively low-cost, long-term funding from the 1980s. However, even though the capital market can meet the requirements of the private sector, government, and state-owned enterprises, Indonesian entrepreneurs did not readily tap this source of funds. Before the crisis, bank financing dwarfed financing through the capital market. For example, in 1991 the value of bank loans was ten times the value of equity issues. Since July, 1997, though, bank lending has been declining and capital market financing has become more important for the business sector. In 2001, the value of bond and share issues reached almost three-fourths the value of bank lending (Herwidayatmo, 2001).

It is recognized that excessive dependence on bank borrowing by Indonesian businesses resulted in a mismatch, with long-term investments being financed with short-term bank loans. Such a risky situation contributed to the protracted economic crisis. To reduce this mismatch, the role of the dominant supplier of funds from business should shift from the banking sector to the capital market.

2.1.2. Malaysia Capital Market

Malaysia, a middle-income country, transformed itself from 1971 through the late 1990s from a producer of raw materials into an emerging multi-sector economy. Today, about a quarter of all Malaysian's exports are electronic products. (www.abacus.com)

Malaysia's stock market also presents opportunities. Currently, private US investors cannot purchase Malaysian shares (not even ADRs or pink-sheet stocks), which is a plus sign for intelligent investors to be front-runners. Malaysia's plantation companies, transportation companies, and companies related to tourism would be the main source of income.

From a foreign perspective it's a signal of change. Malaysia has managed the equivalent of \$316 million in stocks and bonds at Hwang-DBS Asset Management Sdn. in Kuala Lumpur. This heralds a new beginning for the country.

2.1.3. Philippine Capital Market

The formal Philippine capital market is one of the oldest in Asia. The Manila Stock Exchange was established in 1927. Gold and copper mining stocks dominated trading during the first five decades of operation, and trade in oil stocks caused a boom in the late 1970s. A rival financial group established a second stock exchange in 1963.

After years of conflict, the government induced the two exchanges to merge in 1994 to form the Philippine Stock Exchange (PSE). The stock market took on increasing importance in the late 1980s. In the five-year period beginning in 1987, total market capitalization grew from \$3 billion to \$14 billion (Asian Economic News, 2000).

This resulted both from bidding up prices of existing issues and major new offerings, such as from privatization of the Philippine National Bank and by the property-holding Ayala Corporation. Despite major fluctuations, as with a coup attempt in 1989, the market continued to boom, with capitalization jumping to \$40 billion by 1993 and doubling again by 1996 to \$81 billion. But the market lost more than half its value in dollar terms following the crash in Asian financial markets. It ended 1997 at \$36 billion. A government regulatory body, the Philippine Securities Exchange Commission (SEC), was formed in 1936. In its oversight of securities markets, the SEC operated on the principle of "merit regulation."

Under this approach, the commission had to give its approval prior to public issuance of stock in any company. After reviewing and valuating the company's offering, the SEC would set the price at which the issue could be sold. The commission did not conduct surveillance or actively regulate the stock exchange. Units within the SEC frequently had overlapping responsibilities, and staff had little or no knowledge of regulations or the techniques required to conduct tasks. The commission chairman made all major decisions.

2.1.4. Singapore Capital Market

The Singapore stock market was operated jointly with Malaysia until 1973, and until 1989, Malaysian companies were listed on both stock exchanges. Later Malaysian and international shares were traded through electronic trading in Central Limit Order Book [CLOB], which was closed after 1998. The growth is gradual; the increase in market capitalization is high, though dominated by a small number of enterprises of the state or statutory boards. Singapore therefore has large companies but fewer than those listed in Malaysia. The majority of the shares in these SOEs were held by one of the four government holding companies (The Library of Congress Country Studies; CIA World Fact book).

At the close of 1999, there were 370 companies listed on the stock market with total market capitalization of Sp\$434 billion, 3.4 times the GDP for that year. Of this market capitalization, 27 per cent is held by one single government holding company, Temasek Holdings.

This domination by the state has persisted from the 1970s. The few privatizations undertaken since 1987 have helped to stimulate trading. This was particularly keen in 1993 with the listing of Singtel. Thus market capitalization leapt from US\$48.8 billion to US\$132.7 billion between 1992 and 1993.2 between 1990 and 1994, trading value had risen from US\$20.2 billion to US\$81.0 billion.

Foreign counters accounted for 20 per cent of the total market capitalization in 1988-92.3 In addition, there was secondary listing of foreign stocks denominated in foreign currencies.

CHAPTER III

REVIEW OF RELATED LITERATURE

This chapter discusses capital market co integration and factors that influence it. Because the writer intends to analyze the capital market of each ASEAN country related with the cointegration of the ASEAN capital market as a whole, the previous research included in this chapter is about co-integration of capital markets and the factors that influence it.

Soebagiyo and Prasetyowati (2003) study the factors that influence the Indonesian Stock Price Indices. They use annual data from the years 1998 to 2002. Stock Price Indices is used as the dependent variable, while for independent variables, they use the sum of money velocity, deposit interest rate, exchange rate, and inflation. For the trial they apply *Partial Adjustment Model*. The conclusion from their research is that there are four variables that influence the Stock Price Indexes that are; inflation variable, the sum of money velocity, interest rate, and previous month stock price indices. Those four variables, except the exchange variable, influence $\alpha =$ 0.05.

Furthermore, *Astuti* (2000) observes the macro analysis of capital market performance using Error Correction Model Approach, using monthly time series data from the years 1996.01 to 1999.11. The capital market performance is reflected by the fluctuation of Stock Price Indices' value, which are very much influenced by Macroeconomics variables, that are; exchange value, which will determine the investment profit level from capital market; public funds from banking sector, as the capital market's main competitor as a source of collecting public funds; and interest rates inside and outside the country, which are considered as an opportunity cost for capital owners that invest their money in the capital market. The analysis model used by Astuti is monetary crisis *dummy* variable, which becomes a shock, then the Error Correction Model is produced. The conclusion from this research is that capital market performance is significantly influenced by the variables of exchange; public funds position; real deposit interest rate; and foreign interest rate, with a monetary crisis dummy variable shock since August 1997. In a short period of time, capital market performance is determined by the variables exchange, public funds position, and real deposit interest rate, while the exchange variable has a negative relationship to capital market performance.

At the same time, *Desak Putu Suciwati* and *Mas'ud Machfoeds* (2000) examine the influence of the Indonesian Rupiah exchange rate to the stocks return. They conduct an empirical study in Jakarta Stock Exchange-registered manufacturing enterprises, by using secondary data samples from manufacturing enterprises registered in the Jakarta Stock Exchange from 1994 to 2000. The independent variables they use are the real effective exchange rate and total debt as a control, while the dependent variables are the cumulative abnormal return and earning per share. This research uses a difference-test analysis for regression model in two different periods including the *Chow difference-test* and *the classic assumption test*. The conclusion drawn by them is that Rupiah exchange rate fluctuation will cause a profitable and loss exchange risk. If the Rupiah value fluctuates in normal conditions, the risk to cash flow and company value is considered profitable, on the other hand, when Rupiah depreciation occurs, the risk to cash flow and company value is considered to be a loss.

In addition to the issue of capital market integration, *Osamah Al-Khazali, Ali F.Darrat,* and *Mohsen Saad* (2006) study the intra-regional integration of the GCC stock markets: the role of market liberalization. It examines empirically whether, and to what extent, equity markets in the Gulf Cooperation Council (GCC) are integrated inter-regionally. The study focuses on four GCC countries, namely, Saudi Arabia, Kuwait, Bahrain, and Oman. It examines stock price indexes in these four GCC countries on a weekly basis over more than a nine year period from October 1994 to December 2003 (482 weekly observations). This study uses weekly (as opposed to daily) data to avoid potential problems with non-trading, non-synchronous trading or bid/ask spreads. They use the Johansen-Juselius (1990) cointegration test and unit root tests. Nonstationary variable is characterized with time-varying stochastic properties.

It resulted as the four equity markets of the Gulf become more integrated intra-regionally, opportunities for long-term gains from portfolio diversification across these markets are likely to disappear. However, the prospects for short-term diversification gains remain possible especially if the relatively high average returns in the Gulf markets achieved in recent years persist and transaction costs continue to fall resulting from efforts to reform and liberalize capital markets in the region.

This research concerning the co integration between the stocks markets of ASEAN countries, that are; Indonesia, Singapore, Malaysia and the Philippines. We use quarterly data, from years 1990 to 2004 by applying the Johansen co integration analysis model. The dependent and independent variables are substitutable, that are; Indonesian, Singaporean, Malaysian, and the Filipino stock price indexes.

The dependent variable used in most of the research above is ER (exchange rate), while the independent variables are: deposit interest rate, earning per share, foreign interest rate, and inflation rate. The estimation models typically used are:

- 1. ECM (Error Correction Model)
- 2. PAM (Partial Adjustment Model)

- 3. Chow Test, difference-test
- 4. Classic assumption test.

In this thesis, the writer would like to do something different by applying the ARDL analysis model, using Indonesian, Malaysian, the Philippine and Singapore stock price index reversibly used as dependent and independent variables.



Table 1.Summary of Literature Review

No	Authors & Year	Objectives	Model	Variable	Data	Results
1.	Daryono Soebagiyo and Endah Heni Prasetyowati (2003)	Study the factors that influence the Indonesian Stock Price Indices.	Partial Adjustment Model.	Stock Price Indices is used as the dependent variable, while the independent variables they use are sum of money velocity, deposit interest rate, exchange rate, and inflation.	Annual data from years 1998 to 2002	There are four variables that influence the Stock Price Indices that are; inflation variable, the sum of money velocity, interest rate, and previous month stock price indices. Those four variables, except the exchange variable, influence $\alpha =$ 0.05.
2.	(2000)	study macro analysis of capital market performance using Error Correction Model Approach	Monetary crisis <i>dummy</i> variable, which become a shock, then Error Correction Model is being made.	Exchange value that will determine the investment profit level from capital market; public funds from banking sector as the capital market's main competitor as a source of collecting public funds; and	time series data from 1996.01 to year 1999.11.	I ne capital market performance is significantly influenced by exchange variable; public funds position; real deposit interest rate; and foreign interest rate, with a monetary crisis dummy variable shock since August 1997. In a short period

			ISL	interest rates inside and outside the country, which are considered as an opportunity cost for capital owners that invest their money in the capital market		of time, capital market performance is determined by exchange variable, public funds position, and real deposit interest rate, while exchange variable has a negative relationship to capital market performance.
3.	Desak Putu Suciwati and Mas'ud Machfoeds (2000)	Examine the influence of Rupiah exchange rate to the stocks return in an empirical study of Jakarta Stock Exchange- registered manufacturin g enterprises.	Difference- test analysis for regression model in two different periods includes the Chow Test, difference- test and classic assumption test.	The independent variable is the real effective exchange rate and total debt as a control, while the dependent variable is the cumulative abnormal return and earning per share.	Secondary data (samples of manufactur ing enterprises registered in the Jakarta Stock Exchange from 1994 to 2000).	Rupiah exchange rate fluctuations will cause profit and loss exchange risks. If the Rupiah fluctuates in normal conditions, the risk to cash flow and company value is considered profitable, on the other hand, when Rupiah depreciation occurs, the risk to cash flow and company value is considered to be a loss.

4.	Osamah Al-	Study about	The	Non-	Weekly (as	As the four
	Khazali, Ali	intra-regional	Johansen-	stationary	opposed to	equity
	F.Darrat, and	integration of	Juselius	variable is	daily) data	markets of the
	Mohsen Saad	the GCC	(1990)	characterize	to avoid	Gulf become
	(2006)	stock	cointegrati	d with time-	potential	more
		markets with	on test and	varying	problems	integrated
		the role of	unit root	stochastic	with non-	intra-
		market	tests.	properties.	trading,	regionally,
		liberalization			non-	opportunities
		. It examines			synchronou	for long-term
		empirically,			s trading or	gains from
		whether, and			bid/ask	portfolio
		to what			spreads.	diversification
		extent, equity				across these
		markets in		7		markets are
		the Gulf				likely to
		Cooperation				disappear.
		Council				However, the
		(GCC) are				prospects for
		integrated				short-term
		inter-				diversification
		regionally.				gains remain
						possible
						especially if
						the relatively
						high average
						returns in the
		14				Gulf markets
						achieved in
						recent years
						persist and
		14	Carlo -	- 1 - 0		transaction
						costs continue
						to tall
						resulting from
						ettorts to
						retorm and
						inderalize
						capital
				ļ		markets in the
			1			region.
				1		[

CHAPTER IV

THEORETICAL FRAMEWORK

This chapter discusses about the basic theories of this thesis and will give description in guiding the writer also the reader to figure out about the next chapter.

4.1. Theoretical Background.

4.1.1 Market Integration

Market Integration is the development of free market among number of countries with the purpose of gaining benefit from international specialization. (Collin's Economic Dictionary) There are four kind of market integration varying from untied trade partner association to fully integrated country group. (Egger, Falkinger, Grossmann, 2005)

1. Free Trade Area

The member gets rid of the trade barrier among them, but still operate particular barrier to those which are not member countries.

2. Customs Union

The member gets rid of the trade barrier among them and create similar barrier to those which are not member countries such as one general external tariff.

3. Common Market

Common market is one customs office alliance that giving free space for labor and capital to go off the national border.

4. Economic Union

This is a general market that integrates the member's general purpose concerning the economic growth, and also the harmonization of monetary and fiscal policy, along with other policies.

4.1.2 Measuring financial integration.

Financial markets are integrated when the law of one price holds. This states that assets generating identical cash flows command the same return, regardless of the domicile of the issuer and of the asset holder (www.wikipedia.com) given this definition, financial market integration can be measured by comparing the returns of assets that are issued in different countries and generate identical cash flows.

When identical assets command different returns one would tend to conclude that financial markets are not integrated, for instance because legal barriers prevent capital from freely flowing between countries. Such barriers may reflect capital controls, tax codes, accounting and auditing differences, different bankruptcy law, different quality of judicial enforcement, etc. However, some caution is warranted. Countries may share a common legal and regulatory framework, but still identical assets may command different returns. Beyond legal barriers, there might be economic barriers, for instance situations of asymmetric information that induce investors to evaluate differently assets that are otherwise identical. A pre-requisite for measuring financial market integration is the identification of assets generating identical cash flows. Lacking this, one might consider slightly different assets, provided it is possible to control for the differences in the risk associated with their cash flows. If one fails to identify identical assets, or does not correct appropriately for their risk differences, one will conclude that financial markets are segmented even when they are in fact integrated. This highlights the crucial role of a specific asset and therefore to a specific market. Consider the credit market, the market for fixed-income securities and the stock market. For each of them, measurement of financial integration is based on asset returns and prices, while others are based on asset quantities. The latter may be flow measures, such as international capital flows, or stock measures, such as the amount of cross-border holdings of debt and equity.

The quantity need to be emphasized, despite the fact that the law of one price has no obvious concern for that. Nevertheless, these measures are of interest. In a system with no financial barriers, the domicile of assets issuers and holders should play a decreasing role over time.

Flow and stock measures may allow us to assess whether such a process is taking place or not. Finally, the literature has considered also direct or indirect measures of financial integration. Several studies consider the effects of financial market integration on households' choices, for example the portfolio choice between home and foreign assets. Still others analyze its effects on companies' choices, such as mergers with foreign companies or acquisitions of foreign subsidiaries. Further measures of integration are based on broad market characteristics, e.g. the size of equity, bond and bank markets, or the cross-border penetration of commercial banks and other financial institutions.

On financial integration, we can classify existing indicators of financial integration into four broad categories:

- a) Indicators of credit and bond market integration;
- b) Indicators of stock market integration;
- c) Indicators of integration based on economic decisions of households and firms.
- Indicators of institutional differences that may induce financial market segmentation.

One can then evaluate existing indicators according to four criteria. Firstly, the availability of data needed to construct the considered indicators. Secondly, the reliability of the data on which these indicators are based. Thirdly, the economic meaning of the indicators. Finally, the ease with which they can be constructed and updated.

When evaluating the indicators against the above criteria, indicators based on price and return data tend to dominate indicators based on quantities, i.e. stock or flow data. Price data are more easily available and more accurate. Moreover, with reference to the law-of-one-price, price-based indicators also have a clear-cut interpretation, which is often lacking for quantity indicators when based on flow data. Quantity indicators based on stock data, however, sometimes can be interpreted in the light of portfolio theory and thus deserve serious consideration. From a methodological viewpoint, whenever theoretical benchmark values for the indicators are available, one can analyze financial market integration in terms of β -convergence and σ - convergence. These concepts have been developed in the economic growth literature but can be adapted for measuring financial market integration. β -convergence measures the speed of adjustment of deviations of countries to the long-run benchmark value. σ -convergence measures if countries tend to become more similar over time in terms of deviations from the benchmark. (Pagano, 2007)

4.1.3 Indicators of Market Integration

The first set of indicators includes interest-rate differentials to analyze the degree of convergence in the interbank market, the government bond market, the mortgage market, and the short-term corporate loan market in the ASEAN.

In the government bond market (maturity of 10 years) there are signs of increased β -convergence and σ -convergence. However, the largest part of the reduction of interest rate differentials took place already. There is also evidence that convergence in the ASEAN zone is stronger. Overall, convergence is almost achieved in this market.

In the mortgage market there is evidence of β -convergence, which gains strength. But the degree of σ -convergence is weak and does not increase after. This can be taken as evidence that mortgage markets are not yet fully integrated. Also quantity-based indicators of money market and bond market integration have been produced, using data on the international portfolio composition of institutional investors.

The analysis of money market funds reveals that in most countries money market funds moved to an international investment strategy, which indicates a high degree of integration and confirms the findings based on interest rate differentials.

The analysis of bond market funds indicates that the bond market is less integrated than the money market. While in some ASEAN countries the adoption of the US Dollar caused a strong shift towards internationally investing bond funds, these developments are not equally strong everywhere.

Price-based indicators of credit market integration have been computed using data on bank charges' differentials for cross-country credit transfers. The proposed indicators provide only limited evidence in favor of convergence. While the within-country dispersion of foreign bank transfer charges decreases, the average cost of cross-country transfers does not appear to converge across countries. Moreover, costs depend on the direction of the bank transfer, suggesting that credit markets in ASEAN be not fully integrated yet.

Finally, quantity-based indicators of credit market integration have been considered. A first set of indicators considered the importance of foreign banks in terms of the number of foreign banks present in the domestic markets and the overall share of assets held by foreign banks. These indicators provide little evidence of increased banking market integration. Foreign banks play a marginal role for the national banking systems. Moreover, Singapore is the only country with a significant increase in the number and asset share of foreign banks.

A second set of indicators considered cross-border lending and borrowing as an alternative way of achieving credit market integration. In particular, the shares of foreign assets and liabilities held by each national banking sector have been evaluated relative to a benchmark portfolio to assess the degree of the home bias in these portfolios:

Overall, this set of indicators suggests that convergence is achieved in the money market and government bond market. In contrast, most indicators of credit market integration suggest that progress in financial integration has so far been modest and is still far from being complete.

4.1.4 Indicators of Stock market Integration

There are some important indicators to measure the stock market integration. Each of them is related to one another:

1. Price-based indicators of stock market returns.

Since asset pricing models are difficult to estimate and require long time series to provide reliable estimates, one can consider the correlation of stock market returns as an alternative indicator, mainly due to its simplicity. Given the instability of the indicator and the questionable economic interpretation of ex-post return correlations, it appears unwise to draw any conclusions based on such kind of indicators.
2. Quantity-based indicators of stock market integration.

It can be built based on the international investment strategy of equity funds. Such indicators show an increasing degree of stock market integration in the ASEAN area:

- The analysis of the investment fund industry reveals that the share of equities that is managed by funds with an international investment strategy increased for the ASEAN countries.
- The evidence based on the analysis of the share of foreign equities in pension funds is similar. Most countries saw an increase in the share of foreign equities. Unfortunately, data availability problems prevent a timelier monitoring of these developments.
- These results are further confirmed by evidence on the share of foreign assets held by insurance companies. Again, data availability problems preclude an analysis of more recent developments.

4.1.5 Why using Stock Price Index as indicators of Stock Market Co Integration?

Stock price indexes are useful for benchmarking portfolios, for generalizing the experience of all investors, and for determining the market return used in the Capital Asset Pricing Model. A hypothetical portfolio encompassing all possible securities would be too broad to measure, so proxies such as stock indexes have been developed to serve as indicators of the overall market's performance. In addition, specialized indexes have been developed to measure the performance of more specific parts of the market, such as small companies. It is important to realize that a stock price index by itself does not represent an average return to shareholders. By definition, a stock price index considers only the prices of the underlying stocks and not the dividends paid. Dividends can account for a large percentage of the total investment return.

4.1.6 Weighting.

One characteristic that varies among stock indexes is how the stocks comprising the index are weighted in the average. Even if no explicit weighting is applied when calculating an average, there may be an implicit one. While a one dollar price change in one stock in a simple stock price index will have the same effect as a one dollar change in any other stock, a given percentage increase of a higher price stock influences the index more than a corresponding percentage increase of a lower price stock. For example, a 1% change in a \$100 stock will change the index more than a 1% change in a \$10 stock. For this reason, indexes that are based on the simple summation of stock prices are referred to as *priceweighted*.

In a price-weighted index, a change in the stock price of the largest company in the index would influence the average no more than an equal change in the stock price of the smallest company in the index. However, the larger company's performance will have a greater impact on the economy. To consider the size of a company, a *market capitalization weighted* index (or *value-weighted* index) can be used, in which a company's impact on the index is proportional to the size of the company. In value-weighting, in effect the market capitalization of the stocks influences the index, not the prices. For this reason, there is no need to adjust for stock splits.

Some indexes do not weight for market capitalization, but do adjust for price differences to remove the implicit price weighting. This unweighted method tracks the performance of an index in which equal dollar amounts are invested in the underlying stocks. Some consider an unweighted index to be a good indicator of the market's performance from the perspective of the investor who places an equal amount of money in each stock in his or her portfolio, regardless of its market capitalization. However, if every investor placed an equal amount of money in each investment, relatively few investors would own small-cap stocks, so an unweighted index would not reflect the portfolio performance of the average investor when all investors are considered.

4.1.7 Hypothesis

Some previous research (Chan et al., 1992; DeFusco et al., 1996; Masih et al., 1999) document that stock markets in the Asian region are interdependent not only among themselves, but also with some of the developed market. Furthermore, those stock markets are even more interdependent during and after financial crises (Sheng et al., 2000; Yang et al., 2003)

In the case on the ASEAN, Palac-McMiken (1997:299) reports the existence of co integration in the countries' stock markets, except Indonesia, before the 1997 crisis. In contrast, Roca (2000:145) finds the existence of

interdependency among ASEAN's stock markets in the short run, but not significantly related in the long run before the 1997 crisis.

Therefore, based on these findings, it is hypothesized that the four ASEAN's stock markets (Indonesian, Malaysian, Philippine, and Singaporean) are interdependent toward each other.



CHAPTER V

RESEARCH METHOD

5.1 Introduction

This chapter presents the empirical methods employed in this research. Before proceeding to bound testing co integration based on ARDL, the researcher conducts unit root test on the variables used the Augmented Dickey Fuller (ADF) Method.

5.2 Research Method

Referring to the research conducted by the previous researchers about the co integration test, we uses the same hypothesis but different variables and methods. For example; Osamah Al-Khazali, Ali F.Darrat, and Mohsen Saad (2006) analyzed the intraregional integration of the Gulf Cooperation Council Stock Markets by applying the Johansen co integration procedure test. The purpose is to find out whether, and to what extent, equity markets in the Gulf Cooperation Council (GCC) are integrated interregionally. The error correction model used is to find out the existence of long run equilibrium between dependent variable and independent variables and the relationship among them. This method is to find the short run and long run relationship between dependent and independent variables in order to avoid spurious regression.

In this research, we analyze the co integration between ASEAN stock market of Indonesian, Malaysian, The Philippines, and Singaporean during period 1990:1 - 2004:2. We use unit root test to know whether the data are stationer or not and use bound test to avoid the error term in the data interpretation.

5.3 Research Subject

Indonesian, Malaysian, The Philippines and Singapore Stock Price Index are the subject of research. The data ranges are from 1990:1 – 2004:2 collected from each 4 ASEAN countries financial and monetary department website.

5.4 Research Variables

We use four variables i.e., the Indonesian, Malaysian, The Philippines, and Singapore Stock Price Index. Its position as dependent and independent variable are cyclically substituted. These data are in log form and taken from 1990:1 to 2004:2. The Johansen test is conducted to measure the co integration strength between each variable. We also use unit root test to find out whether the data are stationary or not, and bound test to get the optimum time lags.

5.5 Technique of Data Analysis

This research use Unit Root test, Co integration test and bound test based on ARDL approach. We use quantity time series data, in time series data usually show spurious correlation, because the data are not stationer and not co integrated. To avoid that problem, the test must follow the following requirements:

5.5.1. Integration Testing (Unit Root Test) or Stationery Test

This test is to find out whether the data are stationer or not. If the data are not stationer, they need to be differentiated many times to get the stationer data. The data are stationer if they follow this term:

Average : $E(Y_t) = \mu$ (constant average)

Variance : Var $(Y_t) = E (Y_t - \mu)^2 = \alpha^2$ (constant variance)

Covariance: $\mathbf{k} = [(\mathbf{Y}_t - \boldsymbol{\mu}) (\mathbf{Y}_t + \mathbf{k} + \boldsymbol{\mu})]$

(Covariance between two periods depends on time length, between two periods, does not depend on the counting of the covariance).

Analyzing the time series data which are stationer has moved to average range, it means that the progress of variables point causes random factor. This test method and root square are developed by Dickey and Fuller (Df test) and Augmented Dickey Fuller (ADF test). The data are tested by the following three models:

$\Delta \mathbf{Y}_t = \delta \mathbf{y}_{t-1} + \mathbf{U}_t$	(1)
$\Delta Y_t = \beta_1 + \delta Y_{t-1} + U_t$	(2)
$\Delta \mathbf{Y}_t = \boldsymbol{\beta}_1 + \boldsymbol{\beta}_{2t} + \delta \mathbf{Y}_{t-1} + \mathbf{U}_t$	(3)

ADF test with maximum velocity as much as K = N. the model is:

$$\Delta Y_{t} = \delta y_{t-1} + \alpha_{i} \sum_{i=1}^{m} \Delta Y_{t-i} + U_{t}$$

$$\Delta Y_{t} = \beta_{1} + \delta y_{t-1} + \alpha_{i} \sum_{i=1}^{m} \Delta Y_{t-i} + U_{t}$$
(4)
(5)

$$\Delta Y_{t} = \beta_{1} + \beta_{2t} + \delta y_{t-1} + \alpha_{i} \sum_{i=1}^{m} \Delta Y_{t-i} + U_{t} \qquad (6)$$

Tested hypothesis are:

Ho = δ = 0 (non stationer data) and Ha = δ = 0 (stationer data)

(Kuncoro, 2001:146).

5.5.2. Johansen Co Integration Test

This test is to investigate the degree of linkage among variables. Since results from the Johansen test that may sensitive to the particular lag structure used in the tests, the appropriate lag profile is determined in the tests based the AIC (Akaike Information Criterion) is conjunction with the added requirement that the resulting errors must also be white noise. The Johansen co integration test is based on the following model:

$$\Delta xt = \sum_{i=1}^{p-i} \Gamma i \Delta xt - i + \pi xt - i + \varepsilon t \quad (1)$$

Where xt and zt are $(n \ge 1)$ vectors, π is an $(n \ge n)$ matrix of parameters, and p is the lag length. The Johansen methodology requires estimating models 1 and examining the rank of matrix π . If rank $(\pi) = 0$, there is no stationary linear combination of the $\{x|t\}$ process, that is, the variables are not cointegrated. Since the rank of a matrix is the number of non-zero eigenvalues (λ) , the number of $\lambda > 0$ represents the number of contegrating vectors among the variables. The following two statistics can be used to test for non-zero eigenvalues:

$$\lambda \text{trace}(r) = -T \sum_{i=r+1}^{N} \ln(1 - \lambda i)$$
 (2)

$$\lambda \max(r, r+1) = -T \ln(1 - \lambda r+1)$$
 (3)

Where λi is the estimated eigenvalues, T is the number of valid observations, n is the lag length, and r is the number of cointegrating vectors. Note that λ trace statistic is simply the sum of λ max statistic. In equation 2, λ trace tests the null hypotheses that the number of distinct cointegrating vectors is less than or equal to r against a general alternative.

The λ max statistic tests the null hypothesis of *r* cointegrating vectors against r + 1 co-integrating vectors. Johansen and Juselius (1990) derive the critical values of λ trace and λ max by simulation method.

5.5.3. ARDL (Autoregressive Distributive Lags) Approach

ARDL method is to test the existence of a level relationship between a dependent variable and a set of regressor when it is known with certainty whether the underlying regressor is trend or first difference stationary. The proposed test is based on standard F and t-statistic used to the significance of the lagged levels of the variables in a univariate equilibrium correction mechanism. The asymptotic distribution of this statistic is non standard under the null hypothesis that exists no level relationship irrespective of whether the regressors are I (0) or I (1).

Two sets of asymptotic critical values are provided: one is when all regressor are pure I (1), and the other is if they are pure I (0). These two sets of critical values provide a band covering all possible classifications of the regressor into pure I (0), pure I (1) or mutually cointegrated. Accordingly, various bounds testing procedures are proposed. It is shown that the proposed test is consistent, and their asymptotic distribution under the null and suitable defined local alternatives is derived.(Pesaran & Shin, 2001)

5.5.4.1 Bound Test based ARDL approach.

In order to test the absence of a level in data that affects in the absence of level relationship between Yt and Xt, it differentiates among five cases of interest delineated according to how the deterministic components are specified, and these five cases are presented in tables of bound test (see appendix) by Pesaran to detect the co integration. The cases are:

- a. Case I (no intercepts, no trends) co = 0 and cl = 0. That is $\mu = 0$ and $\gamma = 0$. $\Delta \gamma_t = \pi \text{ yy } y_t - 1 + \pi \text{ yx.x } X_{t-1} + \sum_{i=1}^{p-1} \psi_i \Delta z_{t-1} + \psi \Delta x_t + \mu_t$
- b. Case II (restricted intercepts, no trend) co = -(π yy, π yx.x) μ c₁ = 0, γ = 0

$$\Delta \gamma_t = \pi \operatorname{yy} (\gamma_{t-1} - \mu_y) + \pi \operatorname{yx} (\mathbf{x}_{t-1} - \mu_x) + \sum_{i=1}^{p-1} \quad \forall i \; \Delta \mathbf{z}_{t-1} + \forall \; \Delta \mathbf{x}_i + \mu_i$$

c. Case III (Unrestricted intercepts, no trends) $co \neq 0$, cI = 0. $\gamma = 0$. The intercept restriction $co = -(\pi yy, \pi yx.x)$ is ignored

$$\Delta \gamma_t = \mathbf{co} + \pi \mathbf{y} \mathbf{y} \mathbf{y}_{t-1} + \pi \mathbf{y} \mathbf{x}_t \mathbf{x} \mathbf{x}_{t-1} + \sum_{t=1}^{p-1} \quad \forall i \; \Delta \mathbf{z}_{t-1} + \forall \; \Delta \mathbf{x}_t + \mu_t$$

d. Case IV (unrestricted intercepts, restricted trends) $co \neq 0$ and

$$c_1 = -(\pi yy, \pi yx.x) \gamma$$

$$\Delta \gamma_t = \cos + \pi \operatorname{yy} \left(y_{t-1} - \gamma_y t \right) \pi_{yx,x} \left(x_{t-1} - \gamma_x t \right) + \sum_{i=1}^{p-1} \psi_i \Delta z_{t-i} + \psi \Delta x_t + \mu_t$$

e. Case V (unrestricted intercepts, unrestricted trends) $co \neq 0$ and $c_1 \neq 0$ The deterministic trends restriction $c_1 = -(\pi yy, \pi yx.x) \gamma$ is ignored.

$$\Delta \gamma_t = \mathbf{co} + \mathbf{c}_1 \mathbf{t} + \pi \mathbf{y} \mathbf{y} \, \gamma_{t-1} + \pi_{\mathbf{y} \mathbf{x}, \mathbf{x}} \, \mathbf{x}_{t-1} + \sum_{i=1}^{p-1} \quad \forall i \, \Delta \mathbf{z}_{t-1} + \forall \, \Delta \mathbf{x}_t + \mu_t$$

The five cases above are to determine the F statistic of bound test cointegration among variables in given lags. If the computed F statistic is larger than the critical value of bound test of level relationship table, it is cointegrated I (1), on the other hand, if the computed F statistic is less than critical value, it is not co integrated. To detect the long run relationship between the four ASEAN countries stock markets, we employ autoregressive distributed lag cointegration procedure by Pesaran et. al. (1996), we also apply different model selection criteria to test the consistency of the variables.

We start with testing the null of no cointegration against the existence of a long run relationship. Unlike other co integration techniques (e.q., Johansen procedure) which require certain pre testing for unit roots, and that the underlying variables to be integrated in order one, the ARDL models provide an alternative test for examining a long run relationship whether the underlying variables to be integrated I (0), I (1), or fractionally integrated. Accordingly, the null hypothesis of no cointegration (as defined by Ho = $n_1 = n_2 = 0$) is tested against the alternative by means F test. The asymptotic distributions of F statistic are nonstandard irrespective of whether the variables are I (0) or I (1). Pesaran provides two sets of asymptotic critical values. One set assumes that all variables are I (0) and the others are I (1). If the computed F statistic falls above the upper bound critical value, the null hypothesis of no cointegration is rejected. If it falls below the lower bound, the null hypothesis cannot be rejected. Finally, if it falls inside the critical value band, the result would be inconclusive. Once co integration is confirmed, we move to the second stage and estimated the long run coefficient of cointegration function and the associated ARDL error correction model.

5.5.5. Diagnostic Test

This test is to find out whether the data have heterocedasticity, correlation, normality, and functional form problems or not. Diagnostic test is calculated from ARDL through Autoregressive Distributed Lag Estimates. When the result of LM version is more than 10% (0.10), it means that there is rejection of the problem. When LM version is less than 10% (0.10) it means that there is no rejection of the problem.

5.5.6. Coefficient Stability Test CUSUM and CUSUM Square

The CUSUM test make use of the cumulative sum of recursive residuals based on the first set of n observations and is updated recursively and plotted against break points. If the plot of CUSUM statistics stays within the critical bounds of 5% significance level represented by a pair of straight lines drawn at the 5% level of significance whose equations are given in Brown, Durbin, and Evans (1975), the null hypothesis that all coefficients in the error correction model are stable cannot be rejected. If either of the lines is crossed, the null hypothesis of coefficient constancy can be rejected at the 5% level of significance. A similar procedure is used to carry out the CUSUMSQ test, which is based on the squared recursive residuals. If the entire coefficient is relative stable after the test, it shows that the coefficient of variables relationship is quite significant in term of causation relationship.



CHAPTER VI

DATA ANALYSIS

6.1 Introduction

This chapter presents the data analysis. It describes the result of a unit root test, Johansen co integration test, as well with the result of co integration test using bounds test based on ARDL (autoregressive distributive lag) approach.

6.2 Data Analysis

The data used are quarterly data from 1990:1 until 2004:2 period (table a). Before regressing the data, we transform the data into log. The log transformation can reduce the problem such as heteroscedasticity. It compresses the scale in which the variables are measured, thereby reducing a tenfold difference among two values to a twofold difference (Gujarati 1995). We use computer program Eviews and Microfit to interpret the data. The result interpretation begins with stationery data test by using Augmented Dickey Fuller as condition to apply the bound test. Before applying the bound test, a Johansen co integration test is conducted with stationery data to avoid spurious result. In this research, a new approach is also developed to the problem that is testing the existence of a level relationship between a dependent variable and a set of regressors.

The proposed tests are based on F statistics, and they are used to test the significance of lagged levels of the variables in a univariate equilibrium correction mechanism. Once co integration was confirmed, the test moves to the second stage and estimates the long-run coefficients of co integration and the associated ARDL error correction models. Finally, we examine the stability of the long-run coefficients together with the short-run dynamic. We follow Pesaran and Pesaran (1997) and apply the CUSUM and CUSUMSQ to check the coefficient stability [Brown, Durbin, and Evans (1975)].

6.2.1 Unit Root Test ADF

An Augmented Dickey-Fuller (ADF) unit root test is employed to test the stationarity between dependent and independent variables. Then they are employed at the level and first difference of each series in length of lag 4. The results of the ADF at level are reported in Table 2, by taking into consideration the trend variable and no trend variable in the regression. Based on Table 2(a), the t-statistics for all series from ADF tests is statistically insignificant to reject the null hypothesis of non-stationary at 5% significance level. It indicates that all of these series are non-stationary. Therefore, these variables contain a unit root, or they share a common stochastic movement. When the ADF test conducted on the first difference of each variable, the null hypothesis of non-stationary is rejected at 5% significance level as shown in Table 2(b).

Therefore, all the data series are integrated in degree 1. Johansen co integration test will be valid if the data used is non-stationary. As shown in the table 2.a that the data are non-stationary, so it is possible to do the Johansen co integration test. Before stepping

to bound test, it is also important to do unit root test, in order to know whether the data is stationary or not in the same degree.

Table 2. Unit Root Test for Logina, Log Malay, Log Phil, Log Sing

a. Augmented Dickey Fuller Test at Level (lag length = 4)

Variable	ADF test statistic	Critical Value at 5%
Log Ina	-0.457320	-2.9167
Log Malay	-2.627053	-2.9167
Log Phil	-0.127077	-2.9167
Log Sng	-2.744231	-2.9167

Notes: * the ADF value is less than the critical values at all significance level.

- VariableADF test statisticCritical Value at 5%Log Ina-3.021906-2.9178Log Malay-3.530240-2.9178Log Phil-3.589990-2.9178Log Sng-3.473595-2.9178
- b. Augmented Dickey Fuller Test at 1^{st} difference (lag length = 4)

Notes: * the ADF value is larger than the critical values at all significance level.

6.2.2 Johansen Co integration Test

Since the variables are integrated in order one (table 2b), the Johansen co integration test is conducted. It is to examine whether the four variables are co integrated or not. From table 3, we can see that the likelihood ratio of hypothesis CE at none is 56.29040 > critical value at 5% (47.21) and 1% (54.46), so there is a rejection of no co integration hypothesis. The likelihood ratio of hypothesis CE at most 1 is 22.42787 <critical value at 5% (29.68) and 1% (35.65), so there is no rejection and has co integration at most one, which means only one co integration occurs.

Eigenvalue	Likelihood Ratio	5% critical value	1% critical value	Hypothesis No of CE
0.472135	56.29040	47.21	54.46	None
0.274732	22.42787	29.68	35.65	At most 1
0.096524	5.403564	15.41	20.04	At most 2
0.000448	0.023751	3.76	6.65	At most 3

Table 3. Johansen Co integration Test (Lags interval 1 to 4)

6.3 Autoregressive Distributive Lag (ARDL) Framework

The next analysis is dynamic error correction model test using ARDL method. It is conducted because the Johansen co integration test has a weakness, which is even all data are stationery. This test only examines the existence of co integration among variables, but it does not suggest the direction of causation and whether the relation constitutes a co integration function or not. Then we regress the variables into the co integration test through ordinary least square. After that, we regress the variables into the long run estimation and ECM from co integration test result through ARDL approach.

This approach is to testing the existence of a relationship between variables in levels which is applicable irrespective of whether the underlying regresses are purely I(0), purely I(1) or mutually co integrated. The statistic underlying this procedure is the familiar F-statistic.

In general, Dickey Fuller type regression is used to test of lagged levels of the variables under consideration in a conditional unrestricted equilibrium error correction model (Pesaran and Shin, 1994).

6.3.1 ARDL Based Co integration Test

a. Bound Test Approach to Co integration

This stage involves testing for the existence of a long-run equilibrium relationship between 4 ASEAN stock market within a univariate framework. In order to test for the existence of any long-run relationship among the variables, we use the bound test approach to co integration.

One of the benefits of the bound test approach to co integration is that there is a single long-run relationship that can identify which variable is the dependent variable. Furthermore, this approach can be applied to the data which are stationery or non stationery.

The ARDL method of co integration analysis is unbiased and efficient, because the method is used in small samples of data such as in this research. ARDL method can estimate the long run and short run components of the model simultaneously and remove problems associated with omitted variables and autocorrelation. Finally, the ARDL method can distinguish dependent and explanatory variables. The bound test approach suggests that X and Y become co integrated when X is the dependent variable. The results of the co integration tests are presented in Table 4.

As explained in the previous chapter, these hypotheses can be examined using the standard F statistic. However, this study has relatively small sample sizes, those are 53 observations. With small sample sizes, the relevant critical values potentially deviate substantially from the critical values (Pesaran *et al.* (2001).

Table 4. Bounds F Statistic for Co integration Relation

Dependent Variable	F Statistics	Party and the second
LOG INA	2.3941	Construction and Print and
LOG MLY	5.7799	
LOG PHIL	0.99157	
LOG SNG	6.7921	
LOG SNG	6.7921	

1). Bounds F Statistic for Co integration Relation

The relevant critical value bounds are given in Table C1.ii (with a restricted intercept and no trend; number of regressors = 3), Shin and Smith (1999). They are 2.79 - 3.67 at the 5% significance level.

Based on the table above, considering the critical value is between 2.79 and 3.67, Indonesia and the Philippine show less co integration because from the overall lags the computed F statistic is less than 2.79. Malaysia shows co integration in lag 2, which is 5.7799, while Singapore shows very strong co integration because all of the F Statistic is bigger than 3.67.

We conclude that in bound F statistic test, by using Indonesia and Philippines as the dependent variables, variables are less co integrated. Different with Malaysia stock price index as dependent variable, there is co integration between variables in lag 2. While using Singapore stock price index as dependent variable, all variables are strongly co integrated, and there is a significant long-run relationship.

6.3.2 The Long Run Stock Market Co integration Relation

a. Long run approach to Co integration

We test for the presence of long-run relationships. The quarterly data and the maximum number of lags used in the ARDL are set equal to 4. This test is to find the relationship between variables. The calculated coefficients are presented in Table 5.

Table 5. Estimated Long Run Co integration Relation of ASEAN stock market

Dependent	Ina	Malay	Phil	Sing	С
Variable					
Ina	-	-1.0245	2.7747	-6.7323	27.4123
	6	(-1.4802)	(6.9411)	(-0.94789)	(0.76998)
Malay	0.20999	-	-0.72454	-5.3620	31.4871
	(0.30559)		(-0.36563)	(-2.1768)	(1.9454)
Phil	0.34331	0.42053	-	1.5436	-5.8530
	(7.6205)	(1.7016)		(1.0537)	(-0.76547)
Sng	0.12039	0.018258	-0.15250	- (11)	4.6562
	(1.2289)	(0.29654)	(-0.52883)	<u></u>	(6.0519)

1. Long Run Based Model Selection Criterion.

Notes: C stands for constant and figures in the brackets are t statistics

There is long run equilibrium stock market co integration relation and based on AIC model selection criteria, all variables are significant and stable. We try to do the calculation by adding the dummy variables, but it shows similar result (see appendix). The long run stock market co integration equation is:

Indonesia:

.

It means that there is a long run relationship between variables. The equation above shows when Indonesian stock price index increases by 1%, log Malaysia will decrease 1.0245%, log Philippine will increase 2.7747%, and log Singapore will decrease 6.7323%.

Long run equations interpret the variable relationship. Malaysia and Singapore stock markets have negative relationship to Indonesia stock market, but Philippine stock market has positive relationship with Indonesia stock market.

It means that when Malaysia and Singapore stock market decrease, Indonesia stock market will increase, while Philippine stock market increases, Indonesia stock market will increase as well.

Malaysia:

LogMly = 31.4871 + 0.20999 Log INA - 0.72454 Log PHIL - 5.3620 Log SNG

(1.9454)	(0.30559)	(-0.36563)	(-2.1768)
----------	-----------	------------	-----------

It means that there is a long run relationship between variables. The equation above shows when Malaysia stock price index increases by 1%, log Indonesia will increase 0.20999%, log Philippine will decrease 0.72454%, and log Singapore will decrease 5.3620%.

Long run equations interpret the variables relationship. Philippine and Singapore stock markets have negative relationship to Malaysia stock market, but Indonesia stock market has positive relationship with Malaysia stock market. It means that when Philippine and Singapore stock market decrease, Malaysia stock market will increase, while Indonesia stock market increases, Malaysia stock market will increase as well.

The Philippine:

LogPhil = -5.8530 + 0.34331 Log INA + 0.42053 Log MLY + 1.5436 Log SNG

(-.76547) (7.6205) (1.7016) (1.0537)

It means that there is a long run relationship between variables. The equation above shows when Philippine stock price index increases by 1%, log Indonesia will increase 0.34331%, log Malaysia will increase 0.42053%, and log Singapore will increase 1.5436%.

Long run equations interpret the variables relation. All three countries, those Indonesia, Malaysia, and Singapore show positive relationship to the Philippine. It means that when those three countries' stock markets increase, Philippine stock market will increase as well.

Singapore:

LogSng = 4.6562 + 0.12039 Log INA + 0.018258 Log MLY - 0.15250 Log PHIL

(6.0519)	(1.2289)	(.29654)	(52883)
----------	----------	----------	---------

It means that there is a long run relationship between variables. The equation above shows when Singapore stock price index increases by 1%, log Indonesia will increase 0.12039%, log Malaysia will increase 0.018258 %, and log Singapore will decrease 0.15250 %.

Long run equations interpret the variable relation. In this case, only Philippine has negative relationship with Singapore. Then when Philippine stock market decreases, Singapore stock market will increase. However, when Indonesia and Malaysia stock markets increase, Singapore stock market will also increase.

6.2.3. Diagnostic Test

1). Diagnostic Test

The term of serial correlation is defined as correlation between residual of one observation in time series data or space in cross sectional data. The tool of analysis used to detect serial correlation is LM test (Lagrange Multiple Test). LM test used the level of degree χ^2 (chi square), Ho expresses that there is no serial correlation (if χ^2 statistic < value of χ^2 table) and there is a serial correlation (if χ^2 statistic > value of χ^2 table), hence Ho is rejected, and also contrary. Besides that, to get the best lag is by estimating the smallest number of Akaike Info Criterion (AIC). To detect whether there is any heterocedasticity problem or not, we use diagnostic test. If χ^2 statistic is less than the value of χ^2 table, there is no heterocedasticity problem and if χ^2 stat > the value of χ^2 table, there is a heterocedasticity problem.

Table 6. Diagnostic Test (AIC)

a. ARDL based on AIC (Log INA as dependent variable)

```
Diagnostic Tests

Test Statistics * LM Version * F Version *

A:Serial Correlation*CHSQ( 4)= 8.1858[.085]*F( 4, 33)= 1.4741[.232]*

B:Functional Form *CHSQ( 1)= 1.6716[.196]*F( 1, 36)= 1.1500[.291]*

C:Normality *CHSQ( 2)= 106.7525[.000]* Not applicable *

D:Heteroscedasticity*CHSQ( 1)= .060386[.806]*F( 1, 52)= .058215[.810]*

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values
```

In this ARDL test estimation (based on Akaike criterion) using Log INA as dependent variable, the classical assumption through the diagnostic test resulted in the serial correlation test with LM statistic is 0.085 < 0.10 (10%) significance level, so there is autocorrelation in the model. The heterocedasticity test with LM statistic is 0.806 > 0.10 (10%) significance level, it means that there is no heterocedasticity in the model. In the model selection criteria AIC and using of maximum lags 4 have similar value, the model passes the test (see on appendixes), and there is no autocorrelation and heterocedasticity problem. There is no functional form problem because LM statistic 0.196 > 0.10 (10%), but there is normality problem because LM statistic 0.000 > 0.10 (10%). The result by using Log INA as a dependent variable is there are normality problems in both ARDL test estimation and ARDL lags 4 selected (see appendix).

b. Log MLY as dependent variable

Diagnostic Tests *************** Test Statistics * LM Version F Version * * A:Serial Correlation*CHSQ(4)= 6.0032[.199]*F(4, 38)= 1.1882[.332]* * B:Functional Form *CHSQ(1)= .15436[.694]*F(1, 41)= .11753[.733]* C:Normality *CHSQ(2)= 3.0064[.222]* Not applicable * D:Heteroscedasticity*CHSQ(1)= 1.1459[.284]*F(1, 52)= 1.1274[.293]* A:Lagrange multiplier test of residual serial correlation B:Ramsey's RESET test using the square of the fitted values C:Based on a test of skewness and kurtosis of residuals D:Based on the regression of squared residuals on squared fitted values

It shows that there are no autocorrelation, heterocedasticity, functional form, or normality problem.

c. Log PHIL as dependent variable

```
Diagnostic Tests
                                      ****
   Test Statistics *
                                       F Version
                    LM Version
  ****
            *
 A:Serial Correlation*CHSQ( 4)= 2.5018[.644]*F( 4, 37)= .44937[.772]*
 B:Functional Form *CHSQ( 1)= 1.0631[.303]*F( 1, 40)= .80332[.375]*
 C.Normality
                *CHSQ( 2)= .073950[.964]*
                                            Not applicable
* D:Heteroscedasticity*CHSQ( 1)= .010391[919]*F( 1, 52)= .010008[921]*
*******
A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values
```

It also shows no autocorrelation, heterocedasticity, functional form, or normality

problems occur.

```
d. Log SNG as dependent variable
```

```
Diagnostic Tests
******
                    *****
  Test Statistics *
                 LM Version
                           *
                                  F Version
  *
                      *
                                   *
 A:Serial Correlation*CHSQ( 4)= 6.7029[.152]*F( 4, 40)= 1.4172[.246]*
 B:Functional Form *CHSQ( 1)= .78050[.377]*F( 1, 43)= .63062[.431]*
 C:Normality
              *CHSQ(2)= 10.6584[.005]*
                                     Not applicable
* D:Heteroscedasticity*CHSQ( 1)= .72490[.395]*F( 1, 52)= .70755[.404]*
A:Lagrange multiplier test of residual serial correlation
```

B:Ramsey's RESET test using the square of the fitted values

C:Based on a test of skewness and kurtosis of residuals

D:Based on the regression of squared residuals on squared fitted values

There is normality problem because the LM statistic is 0.005, which is less than 0.10 (10%). Those problems such as normality occurs when the data have high volatility, or in this case, outliers or extreme data like the one we use in this research.

6.2.4. Coefficient Stability Using CUSUM and CUSUM Square



Figure LCUSUM test of INA (ARDL based on AIC)

Represent critical bounds at 5% significance level

Figure 1.CUSUM test of MLY (ARDL based on AIC)



Figure 2.CUSUM Square test of PHIL (ARDL based on AIC)



Specifically, the CUSUM test makes use of the cumulative sum of recursive residuals based on the first set of *n* observations and is updated recursively and plotted against break points. If the plot of CUSUM statistics stays within the critical bounds of 5% significance level represented by a pair of straight lines drawn at the 5% level of significance whose equations are given in Brown, Durbin, and Evans (1975), the null hypothesis that all coefficients in the error correction model are stable cannot be rejected. If either of the lines is crossed, the null hypothesis of coefficient constancy can be rejected at the 5% level of significance. A similar procedure is used to carry out the CUSUMSQ test, which is based on the squared recursive residuals.

The graphs show that the coefficient is stable or not. From the square test graph of Indonesia, Malaysia, and Philippine, when CUSUM Square tests of ARDL based on AIC, the blue line is still in the boundaries. Stretch from point (0), means the coefficients is dynamic or consistent (stable) using this model; the straight lines represent critical bounds at 5% significance level. Whether the coefficient stability test using CUSUM based on AIC or using maximum lags 4, the result is the coefficient is still stable (see the appendixes). For the case of Singapore, the blue line is partly upside the boundaries, but by using maximum lag 4, the blue line is inside the boundaries.

CONCLUSION AND POLICY IMPLICATIONS

Conclusion

The objective of this study is to observe the dynamic interaction among stock price index in four ASEAN countries, namely Indonesia, Malaysia, Philippine, and Singapore from period 1990.i to 2004.ii.

The maximum likelihood based λ trace statistics introduced by Johansen (1988, 1991), bound test by using Autoregressive Distributive Lags Approach, finds co integration among the four ASEAN's stock indices during the sample period. This means that those stock price indices are integrated during the period. Thus, the hypothesis that the countries' stock markets are interdependent is confirmed by these results.

Implications

The four ASEAN stock indices are highly integrated. This means that the countries' stock indices influence each other and move together to their long run equilibrium. A decrease in one stock index would be followed by the others. Since most of the ASEAN stock markets, except for the Singaporean stock market, have not been well developed, as their price indices widely fluctuate, they provide not only higher returns, but also higher risks to their investors. Therefore, diversification of portfolio within the ASEAN stock markets is unlikely to reduce the risk due to the high degree of financial integration of these markets.

BIBLIOGRAPHY

Asian Economic News, 2000

Astuti R.D. (2000) Analisis Makro Kinerja Pasar Saham dengan Menggnakan Metode Error Correction Model.

Cerny, Alexandr, Stock Market Integration and the Speed of Information Transmission, August 2004.

Chan, K.C., Gup, B.E. and Pan, M. (1992) 'An Empirical Analysis of Stock Prices in Major Asian Markets and the United States'. Financial Review, 27 (2): 289-307.

Dekle, Robert and Pradhan, Mahmood; Financial Liberalization and Money Demand in ASEAN Countries: Implications for Monetary Policy, March 1997.

DeFusco, R.A., Geppert, J.M. and Tsetsekos, G.P. (1996) 'Long-run Diversification Potential in Emerging Stock Markets', Financial Review, 31(2): 343-363.

Egger, Hartmut; Egger, Peter; Falkinger, Josef; Grossmann, Volker; International Capital Market Integration, Educational Choice and Economic Growth, November 2005.

Gujarati, Damodar N (1995). Basic Econometrics. 3rd edition. Singapore: McGraw-Hill. Singapore.

Herwidayatmo. 2001. The Role of Capital Market to Support the Indonesian Economic Recovery, Indonesia Capital Market Supervisory Agency. Jakarta

Keller, Shiue, Market Integration and Economic Development: A Long-run Comparison, University of Texas, January 2004.

Masih, A.M.M. and Masih, R. (1999) 'Are Asian Stock Markets Fluctuations Due to Mainly to Intra-regional Contagion Effects? Evidence Based on Asian Emerging Markets', *Pacific-Basin Finance Journal*, 7 (3): 251-82.

Palac-McMiken, E.D. (1997) 'An Examination of ASEAN Stock Markets: a Cointegration Approach'. ASEAN Economic Bulletin, 13 (3): 299-311.

Rosul, Mochammad, The Capital Market in Indonesia's Economy: Development and Prospects, March 2002.

Roca, E.D. (2000) Price Interdependence among Equity Markets in the Asia-Pacific Region: Focus on Australia and ASEAN. Aldershot: Ashgate.

Sheng, H. and Tu, A. (2000) 'A Study of Cointegration and Variance Decomposition among National Equity Indices before and during the Period of the Asian Financial Crisis', *Journal of Multinational Financial Management*, 10 (3): 345-65.

Soebagiyo, Daryono and Prasetyowati, E.H (2003) Faktor-faktor yang Mempengaruhi IHSG

Suciwati D.P. and Machfoeds, Mas'ud (2000) Pengaruh Nilai Tukar Rupiah terhadap Return Saham, studi empiris pada perusahaan manufaktur berbasis Bursa Efek Jakarta.

The Library of Congress Country Studies; CIA World Fact book

Walti, S'ebastien, Stock market synchronisation and monetary integration. June 2006.

www.abacus.com, "Malaysian Stocks - Equities in Malaysia" 2004

Yang, J., Kolari, J.W. and Min, I. (2003) 'Stock Market Integration and Financial Crises: the Case of Asia', *Applied Financial Economics*, 13: 477-486.

Table 1. Indonesian, Malaysian, the Philippine, and

Singapore Stock Price Index (in Log)

Year	Log	Log	Log	Log
	Indo	Malay	Phil	Sng
1990 Q1	1.3815	1.8478	1.7193	2.0161
Q2	1.3772	1.8252	1.7235	2.0006
Q3	1.3982	1.8263	1.7490	2.0303
Q4	1.4455	1.7599	1.7825	2.0544
1991 Q1	1.4213	1.8052	1.7882	2.0208
Q2	1.4127	1.8555	1.7875	1.9967
Q3	1.4237	1.8284	1.8041	1.9932
Q4	1.4351	1.8020	1.8162	1.9910
1992 Q1	1.4373	1.8430	1.8195	1.9776
Q2	1.4411	1.8454	1.8136	1.9854
Q3	1.4506	1.8461	1.8202	1.9849
Q4	1.4513	1.8764	1.8209	1.9813
1993 Q1	1.4607	1.8764	1.8122	1.9487
Q2	1.4628	1.9256	1.8089	1.9822
Q3	1.4635	1.9718	1.8129	1.9751
Q4	1.4628	2.0742	1.8209	1.9688
1994 Q1	1.4663	2.1118	1.8395	1.9629
Q2	1.4753	2.0783	1.8457	1.9664
Q3	1.4915	2.1139	1.8561	1.9707
Q4	1.5013	2.0927	1.8500	1.9683
1995 Q1	1.5184	2.0501	1.8488	1.9675
Q2	1.5312	2.0785	1.8531	1.9702
Q3	1.5331	2.0886	1.8621	1.9644
Q4	1.5396	2.0559	1.8814	1.9665
1996 Q1	1.5542	2.1105	1.8927	1.9690
Q2	1.5604	2.1359	1.9009	1.9667
Q3	1.5643	2.1222	1.9058	1.9625
Q4	1.5748	2.1499	1.8982	1.9723
1997 Q1	1.5792	2.1682	1.9261	1.9649
Q2	1.5737	2.1162	1.9159	1.9563
Q3	1.5904	2.0372	1.9149	1.9587
Q4	1.6548	1.8940	1.9227	1.9705

	1.8335	1.8933	1.9425	1.9585
	1.8919	1.8282	1.9628	1.9483
	1.9624	1.6566	1.9689	1.9491
	1.9248	1.7445	1.9952	1.9408
	1.9481	1.8212	1.9978	1.9385
	1.9490	1.9247	1.9908	1.9529
	1.9467	1.9581	1.9877	1.9625
	1.9518	1.9460	1.9926	1.9780
	1.9693	2.0505	1.9987	1.9865
	1.9908	2.0264	1.9921	1.9961
	2.0120	1.9739	1.9987	2.0064
	2.0258	1.9407	2.0103	2.0106
	2.0376	1.9179	2.0060	1.9945
	2.0681	1.8381	2.0065	2.0027
	2.0600	1.8867	2.0175	1.9937
	2.0635	1.8765	2.0107	1.9810
4	2.0688	1.9327	2.0179	1.9776
	2.0650	1.9605	2.0228	1.9903
2	2.0667	1.9278	2.0334	1.9871
2	2.0772	1.8830	2.0286	1.9915
2	2.0873	1.8872	2.0435	2.0032
2	2.0727	1.8894	2.0434	1.9921
2	.0734	1.9390	2.0481	1.9921
2	.0799	1.9709	2.0542	1.9936
2	.0913	2.0040	2.0663	2.0004
2	.1117	1.9959	2,0784	2.0122

E VIEWS

UNIT ROOT TEST

Log Ina

ADF Test Statistic	-0.516403	1% Critical Value* 5% Critical Value 10% Critical Value	-3.5478 -2.9127 -2.5937
		1070 Onucar Value	2.0007

*MacKinnon critical values for rejection of hypothesis of a unit root.

og Malay ADF Test Statistic -2.373409 1% Critical Value* -3.5478 5% Critical Value -2.9127 10% Critical Value -2.5937 *MacKinnon critical values for rejection of hypothesis of a unit root. og Phil ADF Test Statistic -1.311270 1% Critical Value* -3.5501 5% Critical Value -2.9137 10% Critical Value -2.5942 *MacKinnon critical values for rejection of hypothesis of a unit root. togs Sng ADF Test Statistic -1.941133 ADF Test Statistic -1.941133 1% Critical Value* -3.5501 5% Critical Value -2.9137 10% Critical Value -2.942				
ADF Test Statistic -2.373409 1% Critical Value* -3.5478 5% Critical Value -2.9127 10% Critical Value -2.5937 *MacKinnon critical values for rejection of hypothesis of a unit root. og Phil ADF Test Statistic -1.311270 1% Critical Value* -3.5501 5% Critical Value -2.9137 10% Critical Value -2.5942 *MacKinnon critical values for rejection of hypothesis of a unit root. Log Sng ADF Test Statistic -1.941133 1% Critical Value* -3.5501 5% Critical Value -2.9137 10% Critical Value -2.5942	og Malay			
MacKinnon critical values for rejection of hypothesis of a unit root. og Phil ADF Test Statistic -1.311270 1% Critical Value* -3.5501 5% Critical Value -2.9137 10% Critical Value -2.5942 *MacKinnon critical values for rejection of hypothesis of a unit root. og Sng ADF Test Statistic -1.941133 1% Critical Value* -3.5501 5% Critical Value -2.9137 10% Critical Value -2.9137 10% Critical Value -2.9137	ADF Test Statistic	-2.373409	1% Critical Value* 5% Critical Value 10% Critical Value	-3.5478 -2.9127 -2.5937
.og Phil ADF Test Statistic -1.311270 1% Critical Value* -3.5501 5% Critical Value -2.9137 10% Critical Value -2.5942 *MacKinnon critical values for rejection of hypothesis of a unit root. Log Sng ADF Test Statistic -1.941133 10% Critical Value* -3.5501 5% Critical Value -2.9137 10% Critical Value -2.9137	*MacKinnon critical v	alues for reject	tion of hypothesis of a uni	t root.
ADF Test Statistic -1.311270 1% Critical Value* -3.5501 5% Critical Value -2.9137 10% Critical Value -2.5942 *MacKinnon critical values for rejection of hypothesis of a unit root. Log Sng ADF Test Statistic -1.941133 1% Critical Value* -3.5501 5% Critical Value -2.9137 10% Critical Value -2.9137	.og Phil			
MacKinnon critical values for rejection of hypothesis of a unit root. Log Sng ADF Test Statistic -1.941133 1% Critical Value -3.5501 5% Critical Value -2.9137 10% Critical Value -2.5942	ADF Test Statistic	-1.311270	1% Critical Value* 5% Critical Value 10% Critical Value	-3.5501 -2.9137 -2.5942
og Sng ADF Test Statistic -1.941133 1% Critical Value* -3.5501 5% Critical Value -2.9137 10% Critical Value -2.5942	*MacKinnon critical	values for rejec	tion of hypothesis of a uni	t root.
ADF Test Statistic -1.941133 1% Critical Value* -3.5501 5% Critical Value -2.9137 10% Critical Value -2.5942	Log Sng			
	ADF Test Statistic	-1.941133	1% Critical Value* 5% Critical Value 10% Critical Value	-3.5501 -2.9137 -2.5942

*MacKinnon critical values for rejection of hypothesis of a unit root.

<u> </u>	ADF	Critical value at 5%	Decision
Lina	-0.516403	-2.9127	Stationery
L Malay	-2.373409	-2.9127	Stationery
L Phil	-1.311270	-2.9137	Stationery
L Sng	-1.941133	-2.9137	Stationery
Johansen Co integration Test

Date: 07/29/07 Time: 20:14 Sample: 1990:1 2004:2 Included observations: 53 Test assumption: Linear deterministic trend in the data Series: LINA LMALAY LPHIL LSNG Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CF(s)
0.472135 0.274732 0.096524 0.000448	56.29040 22.42787 5.403564 0.023751	47.21 29.68 15.41 3.76	54.46 35.65 20.04 6.65	None ** At most 1 At most 2 At most 3
*(**) denotes rejection of the hypothesis at 5%(1%) significance level L.R. test indicates 1 cointegrating equation(s) at 5% significance level				
Unnormalized C	ointegrating C	Coefficients:		- N
LINA -0.079876 -0.178387 1.663322 -1.643090	LMALAY 0.303239 -0.805080 0.182421 -0.739092	LPHIL -0.365311 -0.060675 -4.457612 4.892944	LSNG 4.983636 -3.189081 -2.155248 4.219116	<u>م</u> محطالة
Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)			-	
LINA 1.000000	LMALAY -3.796379 (17.5435)	LPHIL 4.573491 (31.4987)	LSNG -62.39231 (258.400)	C 276.8484
Log likelihood	440.5116			
Normalized Cointegrating		Ē		

.

Coefficients: 2 Cointegrating				
			I SNG	C
1.000000	0.000000	2.639388	-25.71933	101.3742
0.000000	1.000000	-0.509460 (3.30722)	9.659989 (13.1880)	-46.22147
Log likelihood	449.0238	- and a sub-the second second spectra from the state of a sub-		
Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)		IS	LAI	3
LINA	LMALAY	LPHIL	LSNG	C
1.000000	0.000000	0.000000	-14.00326	59.73988
0.000000	1.000000	0.000000	7.398530	-38.18513
0.000000	0.000000	1.000000	(2.04705) -4.438934 (1.84576)	15.77422
Log likelihood	451.7137			2 7
			Щ.	IE SIA

Bounds F Statistic for Co integration Relation

.

F Order Of statistic Lags 1 1.4051 1.9390 2 2.3941 3 4 1.5450 Malaysia Order Of F statistic Lags 2.3053 1 2 5.7799 2.7294 3 1.5036 4

Indonesia

Philippine

	Order Of	F	
	Lags	statistic	
	1	0.36317	
		0,48260	
9	3	0.45128	Z
È	4	0.99157	Q
ທີ່ ຕໍ່	Singar) MATE	99
\leq	Order Of	F	
Z	Lags	statistic	N
_	1	4.8343	
50	2	5.1990	Ball
	3	6.7921	
	4	5.8777	

BOUND TEST

.

BOUND TEST

INDONESIA

Var	iable Addition Tes	st (OLS case)	* * * * * * * * * * * * * * * * * * *
Dependent variable is List of the variable LOGINA(-1) LOGMI 53 observations used	s DLOGINA s added to the rec LY(-1) LOGPHI for estimation fr	ression: L(-1) LOGSNG(-1) om 1991Q2 to 2004Q2	
******	*****************	*********	*************
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
C	1.6962	2.4969	.67930[.502]
DLOGINA(-1)	.2311/	. 20041	1.1535[.257]
DLOGINA(-2)	.12/91	.16/83	.76214[.452]
DLOGINA(-5)	04549	.18818	-3.4302[.002]
DLOGINA(-4)	- 21004	.22191	.20932[.830]
DLOGMLY(-2)	- 033356	.060207	-2.33131.0101
DLOGMLY(-3)	- 13599	080523	-1 6888[101]
DLOGMLY(-4)	093495	083640	1 1178[272]
DLOGPHIL(-1)	.12778	.54355	23509[.816]
DLOGPHIL(-2)	26695	45688	- 584281.5631
DLOGPHIL(-3)	19021	. 40953	464471.6451
DLOGPHIL(-4)	.42992	. 40404	1.0640[.295]
DLOGSNG(-1)	.12460	. 44754	.27840[.782]
DLOGSNG(-2)	.16353	.36251	.45110[.655]
DLOGSNG(-3)	.73234	. 34440	2.1264[.041]
DLOGSNG(~4)	.15071	. 34581	.43581[.666]
LOGINA(-1)	11498	.12179	94413[.352]
LOGMLT(-1)	084062	.059630	-1.409/[.168]
LOGFNIL(-1)	- 50005	. 34412	. 33/13[.340]
*****		C+C-C .	-1.2/05[.215]
Joint test of zero re Lagrange Multiplier S Likelihood Ratio Stat F Statistic	estrictions on the Statistic CHSQ Sistic CHSQ F(4,	<pre>coefficients of addit (4)= 8.5789[.073] (4)= 9.3586[.053] 32)= 1.5450[.213]</pre>	ional variables:
η		*********	*****************
u			
Variable Addition Test	: (OLS case)	***	******
Dependent variable is	DLOGINA		
List of the variables	added to the reg	ression:	
LOGINA(-1) LOGML	Y(-1) LOGPHI	L(-1) LOGSNG(-1)	
33 UDServations used	TOF ESTIMATION TF	OM 1991Q2 TO 2004Q2	***
Regressor	Coefficient	Standard Error	T_Ostio[orch]
C	1,3335	1.8961	70328[486]
DLOGINA(-1)	.15255	.14897	1.02401.3131
DLOGINA(-2)	.085452	.15616	.54722[.588]
DLOGINA(-3)	60569	. 17911	-3.3817[.002]
DLOGMLY(-1)	22623	.084901	-2.6646[.011]
DLOGMLY(-2)	045627	.072599	62848[.534]
DLOGMLY(-3)	16794	.076652	-2.1909[.035]
DLOGPHIL(-1)	. 18874	.48894	.38601[.702]
DLOGPHIL(-2)	34103	.42047	81297[.422]
ULUGFHIL(-3)	710/1	20110	
DLOGSNG(~1)	21041	.38329	54895[.586]
DLOGSNG(-1) DLOGSNG(-2)	21041 .32653 21176	.38329 .37758 .32424	54895[.586] .86481[.393] .65310[.518]
DLOGSNG(-1) DLOGSNG(-2) DLOGSNG(-3)	21041 .32653 .21176 .67538	.38329 .37758 .32424 .31338	54895[.586] .86481[.393] .65310[.518] 2.1551[.038]

BOUND TEST LOGINA(-1)-.1296610743 -1.2069[.235] LOGMLY(-1)LOGMLY(-1) -.079672 .050136 -1.5891[.12] LOGPHIL(-1) .35330 .30911 1.1430[.261] LOGSNG(-1) -.43267 .27911 -1.5502[.130] -.079672 joint test of zero restrictions on the coefficients of additional variables: Lagrange Multiplier Statistic CHSQ(4)= 11.1362[.025]CHSQ(4)= 12.5012[.014]4, 36)= 2.3941[.069]Likelihood Ratio Statistic F Statistic F(4, 36) = 2.3941[.069]-- ********************** П variable Addition Test (OLS case) ********** Dependent variable is DLOGINA List of the variables added to the regression: LOGINA(-1) LOGMLY(-1) LOGPHIL(-1) LOGINA(-1) LOGMLY(-1) LOGPHIL(-1) LOGSNG(-1 53 observations used for estimation from 199102 to 200402 LOGSNG(-1)Rearessor Coefficient Standard Error T-Ratio[Prob] -1.6630[.104] 2.2960[.027] 1.4006[.169] -.73596[.466] -.080059[.937] -1.0169[.315] -1.3997[.169] -.14380[.886] .17039[.866] -2.4546[.019] -1.0717[.290] 2.4255[.020] .73866[.464] T-Ratio[Prob] -2.8590 C 1.7192 .36913 DLOGINA(-1) .16077 DLOGINA(-2) .23802 .16994 DLOGMLY(-1) DLOGMLY(-2) DLOGPHIL(-1) DLOGPHIL(-2) -.059078 .080274 -.0066739 .083363 -.51663.50804 -.62563 .44698 DLOGSNG(-1)-.055037 .38275 DLOGSNG(-2) .057278 .33616 LOGINA(-1)-.26409 10759 LOGMLY(-1) -.056287 052523 LOGPHIL(-1) .75304 .31047 LOGSNG(-1).18897 25583 Joint test of zero restrictions on the coefficients of additional variables: Lagrange Multiplier Statistic CHSQ(4)= 8.6075[.072] Likelihood Ratio Statistic CHSQ(4)= 9.3927[.052] 8.6075[.072] 9.3927[.052] 1.9390[.123] Statistic F(4, 40) = 1.9390[.123] F Statistic П variable Addition Test (OLS case) ******* Dependent variable is DLOGINA List of the variables added to the regression: LOGMLY(-1)LOGINA(-1)LOGPHIL(-1) LOGSNG(-1)53 observations used for estimation from 199102 to 200402 ***** **** Regressor Coefficient Standard Error T-Ratio[Prob] -1.3312[.190] -1.3312[.190] 2.5434[.015] -1.0908[.281] -22498[.823] .26305[.794] -2.1355[.038] -2.6906[.228] C -1.9970 1.5002 .38862 DLOGINA(-1).15279 DLOGMLY(-1) DLOGPHIL(-1) -.084553 .077518 -.10111 .44943 DLOGSNG(-1).088616 33688 LOGINA(-1) -.20324 .095172 LOGMLY(-1)-.045132 LOGMLY(-1) -.045132 .046573 -.96906[.338] LOGPHIL(-1) .58217 .27574 2.1113[.040] LOGSNG(-1) .10001 .23104 .43284[.667] LOGPHIL(-1)LOGSNG(-1)Joint test of zero restrictions on the coefficients of additional variables: Lagrange Multiplier Statistic CHSQ(4)= 6.0032[.199] _ikelihood Ratio Statistic CHSQ(4)= 6.3712[.173]

Page 2

BOUND TEST F Statistic F(4, 44)= 44)= 1.4051[.248] ************ П MALAYSIA variable Addition Test (OLS case) ****** Dependent variable is DLOGMLY List of the variables added to the regression: LOGMLY(-1)LOGINA(-1) LOGPHIL(-1)LOGSNG(-1)53 observations used for estimation from 199102 to 200402 Regressor Coefficient Standard Error T-Ratio[Prob] .90300[.373] .97709[.336] -.85046[.401] 1.0479[.303] -1.6921[.100] 4.4260 .16535 4.9015 r DLOGMLY(-1).16922 DLOGMLY(-2) DLOGMLY(-3) .19008 -.16165 .16564 .15807 DLOGMLY(-4) .16419 -.27782 -1.0921[.100 -.73704[.466] -3.4819[.001] 1.2588[.217] .66045[.514] .54261[.591] DLOGINA(-1) -.28996 .39341 DLOGINA(-2) -1.1471 .32946 DLOGINA(-3) .46501 .36940 DLOGINA(-4) .28770 .43561 DLOGPHIL(-1).57896 1.0670 .54201[.371] .81689[.420] -1.1778[.248] .62843[.534] 1.3902[.174] 1.6196[.115] DLOGPHIL(-2) .73263 .89686 DLOGPHIL(-3) .94689 .80392 DLOGPHIL(-4) .49844 .79314 DLOGSNG(-1)1.2213 .87852 DLOGSNG(-2) 1.1525 .71161DLOGSNG(-3).26146 .38673[.702 -.95550[.346 -.73645[.467 .82377[.416 .67607 DLOGSNG(-4).64862 .67882 LOGMLY(-1)-.086205 .11705 LOGINA(-1) .19694 23907 LOGPHIL(-1) .68733 -1.0175[.317] -.50044[.620] .67551 LOGSNG(-1)-.38652 77236 Joint test of zero restrictions on the coefficients of additional variables: Lagrange Multiplier Statistic CHSQ(4)= 8.3852[.078] Likelihood Ratio Statistic CHSQ(4)= 9.1280[.058] F Statistic F(4, 32)= 1.5036[.224] variable Addition Test (OLS case) Dependent variable is DLOGMLY List of the variables added to the regression: LOGMLY(-1) LOGINA(-1) LOGPHIL(-1) LOGPHIL(-1) LOGSNG(-1) 53 observations used for estimation from 199102 to 200402 T-Ratio[Prob] 1.7377[.091] 1.1374[.263] -1.1872[.243] 1.1266[.267] -1.2311[.226] -3.4101[.002] 1.1326[.265] Regressor Coefficient Standard Error C 6.6993 3.8552 DLOGMLY(-1).19634 .17263 DLOGMLY(-2) DLOGMLY(-3) -.17524 .14761 .17558 .15585 DLOGINA(-1) -.37289 .30290 DLOGINA(-2) -1.0827.31751 DLOGINA(-3) .41248 .36418 1.1326[.265] 1.13205[.203] .60605[.548] 1.1774[.247] -.88810[.380] 1.6247[.113] 1.3287[.192] DLOGPHIL(-1).60250 .99414 DLOGPHIL(-2) 1.0066 .85493 DLOGPHIL(-3) -.69212 .77932 DLOGSNG(-1)1.2473 .76771 DLOGSNG(-2) .87594 .65926)LOGSNG(-3) .16709 .63719 .26222[.795]

BOUND TEST

PHILLIPINES

П

Variable Addition Test (OLS case) Dependent variable is DLOGPHIL List of the variables added to the regression: LOGPHIL(-1)LOGINA(-1) LOGMLY(-1)LOGSNG(-1) 53 observations used for estimation from 1991Q2 to 2004Q2 Coefficient Rearessor Standard Error T-Ratio[Prob] --kacro[prob] -1.1600[.255] -.63420[.530] -.49391[.625] -.55485[.583] .25192[.803] 2.2173[.034] -.30321[.764] C -1.1711 1.0095 DLOGPHIL(-1) -.13937 .21976 DLOGPHIL(-2) -.091236 .18472 DLOGPHIL(-3) DLOGPHIL(-4) -.091873 .16558 .041154 .16336 DLOGINA(-1).17967 081030 DLOGINA(-2) .020575 .067857 .30321[.764] DLOGINA(-3) .11008 1.4469[.158 1.3188[.197] -.40390[.689] .54588[.589] .97746[.336] .076084 DLOGINA(-4) DLOGMLY(-1) .11832 .089721 -.014078 .034855 DLOGMLY(-2) .021371 .039150 DLOGMLY(-3).031823 .032557 DLOGMLY(-4) DLOGSNG(-1) DLOGSNG(-2) .97746[.336] .12843[.899] -.44885[.657] -1.7235[.094] -.54065[.592] -.96949[.340] -.11780[.907] .079750[.937] 1.3418[.189] 1.4984[.144] .0043433 .033817 -.081218 .18095 -.25261 -.075285 .14657 DLOGSNG(-3) .13925 DLOGSNG(-4) -.13555.13982 LOGPHIL(-1)-.016390 .13913 LOGINA(-1) .0039269 .049241 LOGMLY(-1).032349 .024110 LOGSNG(-1).23837 .15908 Joint test of zero restrictions on the coefficients of additional variables: Lagrange Multiplier Statistic CHSQ(4)= 5.8447[.211] Likelihood Ratio Statistic CHSQ(4)= 6.1928[.185] F Statistic F(4, 32)= .99157[.426] ******************* F Statistic F(4, 32) =Variable Addition Test (OLS case) Dependent variable is DLOGPHIL List of the variables added to the regression: LOGPHIL(-1) LOGINA(-1) LOGM(Y(-1)) LOGINA(-1) $LOGML\tilde{Y}(-1)$ LOGSNG(-1) 53 observations used for estimation from 199102 to 200402 Regressor Coefficient Standard Error T-Ratio[Prob] -.46408[.645] -.20826[.836] -.068956[.945] -.42987[.670] 1.8600[.071] -.0069967[.994] 1.2606[.216] -.33019[.743] - 76125[.795] T-Ratio[Prob] C -.35077 .75585 DLOGPHIL(-1)-.040591 .19491 DLOGPHIL(-2) -.011558 .16762 DLOGPHIL(-3) -.065682 .15279 DLOGINA(-1) DLOGINA(-2) .11046 .059387 -.4355E-3 .062250 DLOGINA(-3) .090005 .071400 DLOGMLY(-1) -.011175.033845 DLOGMLY(-2) -.0075607 .028941 -.26125[.795] DLOGMLY(-3) -.20125[.795] .75547[.455] .16530[.870] -1.8181[.077] -.33973[.736] -.33613[.739] .023085 .030556 DLOGSNG(-1).024880 .15052 DLOGSNG(-2) -.23500 .12925 DLOGSNG(-3)-.042441 .12493 $_{-}OGPHIL(-1)$ -.041419 .12322

****	**************************************	OUND TEST	
0 PHILLIPINES			
Variable Addition Te	est (OLS case)	****	****
Dependent variable i List of the variable	s DLOGPHIL s added to the rec	ression:	**********************
LOGPHIL(-1) LOGI 53 observations used	NA(-1) LOGMLI	((-1) LOGSNG(-1) rom 1991Q2 to 2004Q2	
Rearessor	Coefficient	**************************************	T. Datio[0ach]
c	-1.1711	1.0095	-1.1600[.255]
DLOGPHIL(-1)	13937	.21976	63420[.530]
DLOGPHIL(-2)	091236	.18472	49391[.625]
DLOGPHIL(-4)	091873	.10558	55485[.583]
DLOGINA(-1)	.17967	.081030	2 2173[034]
DLOGINA(-2)	.020575	.067857	.30321[.764]
DLOGINA(-3)	.11008	.076084	1.4469[.158]
DLOGINA(-4)	.11832	.089721	1.3188[.197]
DLOGMLY(-2)	014078	.034855	40390[.689]
DLOGMLY(-3)	.031823	032557	- 24288(.289)
DLOGMLY(-4)	.0043433	.033817	.12843[899]
DLOGSNG(-1)	081218	.18095	44885[.657]
DLOGSNG(-2)	25261	.14657	-1.7235[.094]
DLOGSNG(-4)	- 13555	.13925	54065[.592]
LOGPHIL(-1)	016390	.13913	90949[.340] - 11780[007]
LOGINA(-1)	.0039269	.049241	.079750[.937]
LOGMLY(-1)	.032349	.024110	1.3418[.189]
LUGSNG(~1)	.23837	.15908	1.4984[.144]
Joint test of zero r	estrictions on the	coefficients of addit	ional variables.
Lagrange Multiplier :	Statistic CHSQ	(4) = 5.8447[.211]	
Likelihood Ratio Sta	tistic CHSQ	(4) = 6.1928 [.185]	
F 5LdL15L1C	F(4,	32)= .99157[.426]	
0	12		
Variable Addition Te	st (OLS case)	****	
Dependent variable is	S DLOGPHIL	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	********************
List of the variable	s added to the regi	ression:	
53 observations used	for estimation from	(-1) LOGSNG (-1)	
******	101 CSLIMALION 110	M 1991Q2 TO 2004Q2	****
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
	35077	.75585	46408[.645]
DLOGPHIL(-1)	040591	.19491	20826[.836]
DLOGPHIL(-3)	065682	- 16/62 15270	068956[.945]
DLOGINA(-1)	.11046	.059387	1 8600[071]
DLOGINA(-2)	4355E-3	.062250	0069967[.994]
DLOGINA(-3)	- 090005	.071400	1.2606[.216]
	UIII/5 - 0075607	.033845	33019[.743]
DLOGMLY(-3)	0073007	.028941	26125[.795]
DLOGSNG(-1)	.024880	.15052	165305 8701
DLOGSNG(-2)	23500	. 12925	-1.81811.0771
JLOGSNG(-3)	042441	.12493	33973[.736]
-OGLUIT(-I)	041419	. 12322	33613[.739]

.

Page 5

BOUND TEST

SINGAPORE

Variable Addition Tes	st (OLS case)	******	***
Dependent variable List of the variable LOGSNG(-1) LOG 53 observations used	is DLOGSNG es added to the reg ENA(-1) LOGMLY 1 for estimation fu	gression: (-1) LOGPHIL(-1) rom 1991Q2 to 2004Q2	
Pagraceor	Coefficient	Ctondord Error	T Dati-[n6]
C	1 9622	Stanuaru Error 01/01	I-RATIO[PFOD]
DLOGSNG(-1)		16209	
DLOGSNG(-2)	- 064054	12792	
DLOGSNG(-3)	- 0051580	12610	~.40223[.033] 040974[0693
DLOGSNG(-4)	16503	12671	0400/4[.900]
DLOGINA(-1)	- 015598	073434	_ 21241[222]
DLOGINA(-2)	- 040215	061496	- 65305[518]
DLOGINA(-3)	- 10507	068952	
DLOGINA(-4)	- 045025	081310	_ 553751 5841
DLOGM(Y(-1))	- 016431	031587	- 52010[607]
DLOGMLY(-2)	.046166	035480	1 3012[202]
DLOGMLY(-3)	.041796	.029505	1.4166[166]
DLOGMLY(-4)	.039575	.030647	1,2913[206]
DLOGPHIL(-1)	17611	.19916	- 884231 3831
DLOGPHIL(-2)	036418	.16741	21754[.829]
DLOGPHIL(-3)	.22910	.15006	1.52671.1371
DLOGPHIL(-4)	088703	. 14805	59915[.553]
LOGSNG(-1)	42736	.14417	-2.96431.0061
LOGINA(-1)	.027839	.044625	.62384[.537]
LOGMLY(-1)	013027	.021849	59622[.555]
LOGPHIL(-1)	014442	.12609	11453[.910]
Lagrange Multipiler Likelihood Ratio Sta F Statistic	Statistic CHSQ Itistic CHSQ F(4,	(4) = 22.4473[.000] (4) = 29.1945[.000] (32) = 5.8777[.001]	*****
Variable Addition Te	st (OLS case)	*****	***
Dependent variable i List of the variable LOGSNG(-1) LOGI 53 observations used	s DLOGSNG s added to the reg NA(-1) LOGMLY for estimation fr	ression: (-1) LOGPHIL(-1) om 199102 to 200402	***
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
C	1.5627	.70705	2.2102[.034]
DLOGSNG(-1)	28079	.14080	-1.9943[.054]
DLOGSNG(-2)	04/865	.12091	39588[.695]
DLOGSNG(-3)	0095145	.11686	081418[.936]
DLOGINA(-1)	.0023647	.055552	.042566[.966]
DLOGINA(-2)	04/322	.058231	81266[.422]
DLOGINA(-5)	090025	.066/90	-1.34/9[.186]
DLOGMLY(-2)	022903	.031000	/2532[.4/3]
DLOGMLY(-3)	.030406	.02/0/2	1.8642[.0/0]
$\frac{DLOGRET(-3)}{DLOGPHTL(-1)}$	_ 17010	.V20304 19333	1.4291[.102]
D = O = O = D	- 10537	.10233	30230[.333]
DIOGPHTI (-3)	21217	1/202	0/1/11.000]
OGSNG(-1)	- 33977	10408	1.4044[.140]
OGINA(-1)	.037712	040061	-J.20401.0021 041361 3531
OGM(x(-1))	0000040	019606	43003[CC3]
	.0007740		

SINGAPORE

BOUND TEST

.

Vanjahla uddiv			
variable Addition	Test (OLS case)		
Dependent variabl	******	***********	a style atta atta atta atta atta atta atta at
List of the variable	e 1s DLOGSNG		**********************
LOGSNG(-1)	ples added to the re	gression:	
53 observations w	UGINA(-1) LOGML	Y(-1) IOGPHTI (.1)	
************	sed for estimation f	rom 199102 to 200402	
Regressor		***************	***
C	Coefficient	Standard Frron	*****
DLOGSNG(-1)	1.9622	.91491	I-Ratio[Prob]
DLOGSNG(-2)	25141	.16398	2.1447[.040]
DLOGSNG(-3)	064054	.13283	-1.5331[.135]
DLOGSNG(-4)	0051580	.12619	48223[.633]
DLOGINA(-1)	.16593	.12671	0408/4[.968]
DLOGINA(-2)	~015598	.073434	1.3095[-200]
DLOGINA(-3)	040215	.061496	21241[.833]
DLOGINA(-4)	10507	.068952	
DLOGMLY(-1)	045025	.081310	
DLOGMLY(-2)	010431	.031587	
DLOGMLY(-3)	.040100	.035480	1 30136 2025
DLOGMLY(-4)	030575	.029505	1 41661 1001
DLOGPHIL(-1)	- 17611	.030647	1 2012[2003
DLOGPHIL(-2)	- 036419	. 19916	- 884231 2001
DLOGPHIL(-3)	22010	.16741	- 21754[920]
DLOGPHIL(-4)	088703	.15006	1.5267[127]
LOGSNG(-1)	42736	. 14805	599151 5531
LOGINA(-1)	.027839	.1441/	-2.96431.0061
LOGMLY(-1)	013027	.044025	.623841.5371
COJFTIL(-1)	014442	12600	59622[.555]
loint test of	*******	************	11453[.910]
lagrange Multiplic	restrictions on the	Coefficients of addit	*************
Likelihood Patie	Statistic CHSO	(4) = 22 44735 0001	onal variables:
F Statistic	atistic CHSQ((4) = 29.1945[000]	
****************	F(4,	32) = 5.877710011	
D	***************************************	****************	******
Variable Addition To			and a set
************	3C (ULS Case)		
Dependent variable i	S DI OCSUC	*******	***
List of the variable	s added to the man		
LOGSNG(-1) LOGI	NA(-1)	ession:	
53 observations used	for estimation for	LOGPHIL(-1)	
-	************	199102 to 200402	
Regressor	Coefficient	· · · · · · · · · · · · · · · · · · ·	*************
	1.5627	Standard Error	T-Ratio[Prob]
DLOGSNG(-1)	28079	.70705	2.21021.0341
DLOGSNG(-2)	047865	.14080	-1.99431.0541
DLOGSNG(-3)	0095145	11696	395881.6951
DLOGINA(-1)	.0023647	.11080	081418[.936]
DLOGINA(-2)	047322	.033332	.0425661.9661
DLOGINA(-3)	090025	066700	81266[.427]
DLOGMLY(-1)	022963	021660	-1.3479[.186]
DLOGMLY(-2)	.050468	027072	72532[.473]
DLOGPHTI(-5)	.040850	028584	1.8642[.070]
\mathcal{O}	17910	18722	1.4291[.162]
) $OGPHT((-2)$	10532	15670	98230[.3331
OGSNG(-1)	.21217	14202	67171[.506]
OGTNA(-1)	33972	10408	1.4844[.146]
OGM(Y(-1))	.037712	.040061	-3.2640[.002]
	.0082248	.018696	.94136[.353]
			-43993[.663]

Page 7

ECM LAG 4.txt

ECM lag 4

INA

Autoregressive Distributed Lag Estimates ARDL(4,4,1,4) selected based on Akaike Information Criterion ********** Dependent variable is LOGINA 54 observations used for estimation from 199101 to 200402 Regressor Coefficient Standard Error T-Ratio[Prob] 6.1882[.000] -.31975[.751] -2.5360[.016] LOGINA(-1) .89315 .14433 LOGINA(-2) -.064672 .20226 LOGINA(-3) -.57127 .22526 LOGINA(-4) -2.3300[.010 4.0692[.000] -2.0529[.047] -1.0956[.280] .70860[.483] -.52568[.602] .63838 LOGMLY -.16096 .078409 LOGMLY(-1) -.11948.10905 LOGMLY(-2).069452 .098013 LOGMLY(-3)-.047720 -.52568[.602] 2.1336[.040] 2.0793[.045] -1.2245[.229] .41917[.678] -1.2294[.227] .14402[.886] .44926[.656] -2.3018[.027] 1.6950[.098] LOGMLY(-4).15174 .071121 LOGPHIL .85124 .40938 LOGPHIL(-1) -.56153 .45859 LOGSNG .16904 .40327 LOGSNG(-1)-.45526 .37030 LOGSNG(-2) LOGSNG(-3) .054088 .37556 .16039 .35702 LOGSNG(-4)-.63119 27422 2.8622 C 1.6886 **R-Squared** .99563 **R-Bar-Squared** S.E. of Regression Mean of Dependent Variable .99374 .048910 F-stat. F(16, 37) 526.6500[.000] S.D. of Dependent Variable .61806 4.0278 Residual Sum of Squares .088511 Equation Log-likelihood 96.5449 Akaike Info. Criterion 79.5449 Schwarz Bayesian Criterion 62.6385 DW-statistic 1.9142 Diagnostic Tests Test Statistics * LM Version * F Version * * A:Serial Correlation*CHSQ(4)= 8.1858[.085]*F(4, 33)= 1.4741[.232]* * * B:Functional Form *CHSQ(1)= 1.6716[.196]*F(1, 36) =1.1500[.291]* ÷ C:Normality *CHSQ(2)= 106.7525[.000]* Not applicable D:Heteroscedasticity*CHSQ(.806]*F(1, 52)= .05 1) =.060386[.806]*F(.058215[.810]* ******* A:Lagrange multiplier test of residual serial correlation B:Ramsey's RESET test using the square of the fitted values C:Based on a test of skewness and kurtosis of residuals D:Based on the regression of squared residuals on squared fitted values Estimated Long Run Coefficients using the ARDL Approach ARDL(4,4,1,4) selected based on Akaike Information Criterion ependent variable is LOGINA 4 observations used for estimation from 199101 to 200402 egressor Coefficient Standard Error .69209 T-Ratio[Prob] -1.4802[.147] 6.9411[.000] OGMLY -1.0245 2.7747 OGPHIL .39974

FCM LAG 4. TXT	
LOGSNG -6.7323 7.102494789 27.4123 35.6013 .76998	.349] [.446]
C (7.412)	****
0	
Error Correction Representation for the Selected ARDL Model	
ARDL(4,4,1,4) Selected based on matrix a state s	*****
Dependent variable is dLOGINA	
54 observations used for estimation from 199101 to 2000 at 20000 at 2000 at 20	******
Regressor Coefficient Standard Error 1-Racio	[.987]
dLOGINA10024599 .11516344259	[.660]
dLOGINAZ63838 .15688 -4.0692	[.000] [.047]
dLOGMLY16096 .078409 2.0523	[.022]
dLOGMLY110402 .068917 -1.5094	[.139]
dLOGMLY215174 .071121 -2.1330	[.039] [.044]
dLOGPHIL .85124 .40338 .41917	[.677]
dLOGSNG	[.207]
dLogSNG2 .47080 .30441 1.5460 27422 2.3018	1.0271
dLOGSNG3 2.8622 1.6886 1.6950	[.098]
ac ecm(-1)10441 .085139 -1.2264	[.ZZ/]

List of additional temporary variables crosses d_{10} diagonal = 10GINA-LOGINA(-1)	
dLOGINA1 = LOGINA(-1) - LOGINA(-2)	
dLOGINA2 = LOGINA(-2) - LOGINA(-3)	
dLOGINAS = LOGINA(-S) - LOGINA(-S) $dLOGNLY = LOGNLY - LOGNLY(-1)$	
dLOGMLY1 = LOGMLY(-1) - LOGMLY(-2)	
dLOGMLY2 = LOGMLY(-2) - LOGMLY(-3)	
dLOGPHIL = LOGPHIL-LOGPHIL(-1)	
dLOGSNG = LOGSNG-LOGSNG(-1)	
dLOGSNG1 = LOGSNG(-1) - LOGSNG(-2) dLOGSNG2 = LOGSNG(-2) - LOGSNG(-3)	
dLOGSNG3 = LOGSNG(-3) - LOGSNG(-4)	
dC = C-C(-1) -2.7747*LOGPHIL + 6.7323*LOGSNG -2	7.4123*
ecm = Logina + 1.02+5 Logina	***
**************************************	.46399
R-Squared s.E. of Regression .048910 F-stat. F(13, 40) 4.759	9[.000]
Mean of Dependent Variable .028398 S.D. of Dependent Variable	96.5449
Residual Sum of Squares .088511 Equation tog internion	62.6385
DW-statistic 1.9142	****

diogina and in cases where the error correction model is highly	
restricted, these measures could become negative.	
utoregressive Distributed Lag Estimates	
ARDL(4,4,4,4) SEIECTEO ARDL(4,4,4,4) SEIECTEO	******
venendent variable is LOGINA	
4 observations used for estimation from 199101 to 200402	*******
egressor Coefficient Standard Error T-Rational Standard Error T-Ration 14788 5.74	1[.000]
OGINA(-1) .85001 .147661748 OGINA(-2)035956 .205601748	8[.862]

	ECM	LAG 4.txt	
LOGINA(-3) LOGINA(-4) LOGMLY LOGMLY(-1) LOGMLY(-2) LOGMLY(-3) LOGMLY(-4) LOGPHIL LOGPHIL	ECM 50895 .53760 16102 11667 .054944 047163 .14186 .81800 28816	LAG 4.txt .23258 .17798 .081505 .11432 .10689 .097944 .073372 .41358 .55994	-2.1882[.036] 3.0205[.005] -1.9756[.056] -1.0205[.315] .51403[.611] 48153[.633] 1.9335[.062] 1.9779[.056] 51463[.610]
LOGPHIL(-2) LOGPHIL(-3) LOGPHIL(-4) LOGSNG LOGSNG(-1) LOGSNG(-2) LOGSNG(-3) LOGSNG(-4) C	44851 14022 .48141 .32097 54574 .049486 .33721 73023 1.9730	.53790 .52116 .36956 .42452 .39590 .39593 .38673 .30029 2.0409	83381[.410] 26906[.790] 1.3026[.201] .75609[.455] -1.3785[.177] .12499[.901] .87195[.389] -2.4318[.020] .96672[.341]
R-Squared S.E. of Regression Mean of Dependent Va Residual Sum of Squa Akaike Info. Criteri DW-statistic	.99594 .049186 riable 4.0278 res .082254 on 78.5244 1.7786	R-Bar-Squared F-stat. F(19 S.D. of Dependen Equation Log-lik Schwarz Bayesian	.99367 , 34) 438.6731[.000] t Variable .61806 elihood 98.5244 Criterion 58.6346
*****	Diagnos	tic Tests	*******
* Test Statistics ************************************	* LM Vers ************************************	ion * ***********************************	F Version * *****
* A:Serial Correlatio *	n*CHSQ(4)= 11 *	.8598[.018]*F(4	, 30)= 2.1108[.104]* *
* B:Functional Form *	*CHSQ(1)= 1 *	.2435[.265]*F(1	, 33)= .77784[.384]* *
* C:Normality	*CHSQ(2)= 83	.4653[.000]*	Not applicable *
* D:Heteroscedasticit	y*CHSQ(1)= .00	17760[.966]*F(1	, 52)= .0017102[.967]*
A:Lagrange multipl B:Ramsey's RESET to C:Based on a test D:Based on the reg	ier test of resid est using the squ of skewness and k ression of square	ual serial correla are of the fitted urtosis of residua d residuals on squ	tion values ls ared fitted values
Estimated Long Run C	oefficients using	the ARDL Approach	
******	AKDL(4,4,4	,4) Selected	******
Dependent variable i 54 observations used	s LOGINA for estimation f	rom 1991Q1 to 2004	Q2 ***********************
Regressor LOGMLY LOGPHIL LOGSNG C	Coefficient 81402 2.6861 -3.6129 12.5429	Standard Error .43541 .28067 3.9441 20.1181	T-Ratio[Prob] -1.8695[.070] 9.5704[.000] 91603[.366] .62347[.537]
irror Correction Rep	resentation for th	he Selected ARDL M	odel
ependent variable is 4 observations used	s dLOGINA for estimation fi	rom 1991Q1 to 2004	**************************************
	f	Page 3	

*****	ECM L	AG 4.txt	
Bognoccon		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	***********
duocanal	Coerticient	Standard Error	T-Ratio[Prob]
dLOGINAL	.00/30/0	.15479	.047207[.963]
dLOGINAZ	028649	.17328	16534[.870]
dLOGINA3	53760	.17798	-3.0205[.005]
dlogmly	16102	.081505	-1.97561.0561
dlogmly1	14964	.081288	-1 8409[074]
dlogmly2	094700	073398	-1 20021 2051
dlogmly3	- 14186	073372	1 02251 0617
di ogphti	81800	A1259	
di OGPHTI 1	10733	AD15A	T.3//3[.022]
di OGPHTI 2	24110	•4JLJ4 20220	.248/1[.805]
di ocputi 3	-, J+113 40141	- 20228	88991[.3/9]
deocene	40141	. 30930	-1.3026[.201]
dLOGSNG du occurci	. 32097	.42452	.75609[.454]
alogsngi	. 34354	. 33727	1.0186[.315]
dLOGSNG2	. 39302	. 31580	1.2445[.221]
dLOGSNG3	.73023	. 30029	2.4318 0201
dC	1.9730	2.0409	966721 3401
ecm(-1)	15730	.10312	-1 5254[136]
*******	*******	******	**************
List of additional dLOGINA = LOGINA-LO dLOGINA1 = LOGINA(dLOGINA2 = LOGINA(dLOGINA3 = LOGINA(dLOGMLY = LOGMLY-LO dLOGMLY1 = LOGMLY(dLOGMLY2 = LOGMLY(dLOGMLY3 = LOGMLY(dLOGPHIL = LOGPHIL dLOGPHIL1 = LOGPHIL dLOGPHIL2 = LOGPHIL dLOGPHIL3 = LOGPHIL dLOGSNG1 = LOGSNG(- dLOGSNG1 = LOGSNG(- dLOGSNG2 = LOGSNG(- dLOGSNG3 = LOGSNG(- dLOGSNG3 = LOGSNG(- dC = C-C(-1)) ecm = LOGINA + .8	temporary variables DGINA(-1) -1)-LOGINA(-2) -2)-LOGINA(-3) -3)-LOGINA(-4) DGMLY(-1) -1)-LOGMLY(-2) -2)-LOGMLY(-3) -3)-LOGMLY(-4) -LOGPHIL(-1) -(-1)-LOGPHIL(-2) -(-2)-LOGPHIL(-3) -(-3)-LOGPHIL(-4) DGSNG(-1) -1)-LOGSNG(-2) -2)-LOGSNG(-3) -3)-LOGSNG(-4) 81402*LOGMLY -2.686:	created: 1*LOGPHIL + 3.6129*	LOGSNG -12.5429*
**********	*****	******	******
R-Squared S.E. of Regression Mean of Dependent V Residual Sum of Squ Akaike Info. Criter DW-statistic	.65226 .049186 ariable .028398 ares .082254 ion 78.5244 1.7786	R-Bar-Squared F-stat. F(16, 37 S.D. of Dependent Var Equation Log-likeliho Schwarz Bayesian Crite	.45793) 3.9858[.000] iable .066805 od 98.5244 erion 58.6346
*******	***************	*******	******
R-Squared and R-Bar dLOGINA and in case restricted, these m	-Squared measures ret s where the error con easures could become	fer to the dependent prection model is high negative.	variable nly
LAY			

		ECM	LAG 4.txt				
LOGINA(-1)		17059	.3	6861		.46278[.0	646]
LOGTNA(-2)	4	46385	3	7096		-1.2504	2181
	· .	30522	2	4197		3 7410	0011
	1	5660	.2	3686		2 12651	0201
	1	7202	- 1 - Gi	5000 0260		2.1203	0221
LOGPHIL(-1)	-1	.7393	.0	0209		-2.1000[.	020
LOGSNG	8	53633	. 0	8/39		-1.216/[231]
LOGSNG(-1)	- 4	41845	.6	7234		.62239[.	537 J
LOGSNG(-2)	. (54220	. 6	8928		.93170[.]	357]
LOGSNG(-3)	-1	. 4997	.5	2216		-2.8722 [.	0061
<u> </u>	7	4896	2.	5636		2.9215	0061
~ ******	******	******	*****	*****	*****	*******	*****
D. Sauarad		80083	D_Rar_Cau	borc		8 [.]	7360
R-Squareu		004717	r-bai-syu	r(11)	421	.0. 24 2004 E	0001
S.E. OF REGRESSION		.094/1/	r-Stat.	F(11,	42)	34.2334[.1	
Mean of Dependent va	riable	4.5040	5.0. or 0	epengent	variaon	e	0041
Residual Sum of Squa	res	.37680	Equation	Log-11ke	11000	57.4	4331
Akaike Into. Criteri	on	45.4331	Schwarz B	ayestan	Criterio	n 35.4	4992
DW-statistic		1.9873	Durbin's l	h-statis [.]	tic	.055254[.!	956]
****	*****	*******	****	*******	******	*******	****
		Diagnos	tic Tests				
* * * * * * * * * * * * * * * * * * * *	***	U layiius	111 10313 **********	*******	***	*******	*****
	~			æ.	E Mana		***
* Test Statistics	*	LM vers	100	* 	F Vers	100	* ******
****	*******	*******	*********	********	********	********	*****
*	*			ż			*
* A:Serial Correlatio	n*CHSQ(4)= 6	.0032[.199]	*F(4,	38)=	1.1882[.	332]*
*	*		- 17 Ta	* ` ´		-	_*
* B.Functional Form	*CHSO(1)=	15436[.694]	*F(].	(41) =	.11753[.]	7331*
*	*		10,000[100]	*,	1		· · · · · · · · · · · · · · · · · · ·
* C.Normality	*cuso(2)- 2	00645 2227	* 1	tot annl	icabla	*
^ C.NOTHATTLY	"CHSQ(2)= 3	.0004[.222]		NOC appr	icable	
7	*		ALEAE DOLL				
* D:Heteroscedasticit	y*CHSQ(1) = 1	.1459[.284]	*F(1,	52)=	1.12/4[293]*
*****	******	*******	********	******	*******	******	****
A:Lagrange multipl	ier test	of resid	ual serial (correlat	ion		
R'Ramsey's RESET t	est using	the sou	are of the	fitted v	lues		
C:Rased on a test	of skowne	acc and k	urtosis of	rocidual			
DiBacad on the rea	vi skemic	st coupro	d reciduale		rad fitt	ad value	
Dibased on the reg	ression (n square	u restuuais	Ull Squal	eu mu	eu varues	
U							
Estimated Long Run	Coetticie	ents usin	g the ARDL /	Approach	10 C		
ARDL(1,3,1,3) selecte	ed based	on Akaike II	nformatio	on Crite	rion	
*******	******	*******	********	******	*****	******	****
Dependent variable i	S LOGMLY						
54 observations used	for esti	imation f	rom 199101 1	to 20040)	,		
****************	*******	******	********	*******	- ********	********	****
Degraccov	Cooff	ciont	Ctondan	d Ennon		r patiofp	rah 7
Regiessur	coerri		Stanuart	0717		-raci0[Pl	
LUGINA		10999	. 67	0/1/		. 202221.1	101
LOGPHIL	/	2454	1.9	9810		30263[.7	(10]
LOGSNG	-5.	. 3620	2.4	4632	•	-2.1768[.(035]
С	31.	4871	16.1	1851		1.9454[.(058]
******	******	******	*********	******	*******	*******	*****
Error Correction Bon	racantati	ion for t	ha calactad		101		
LITOL COTTECTION Rep	lesencati		ne selecteu	ARUL MUC			
AKUL(1, 5, 1, 5) selecte	a pasea	on Akatke 1	normatic	n Crite	rion	
*************	********	********	***********	*******	*******	*********	*****
Dependent variable i	s dlogmli	(
i4 observations used	for esti	imation f	rom 199101 1	to 200402	2		
*****	****	*****	*******	******	******	****	****
learessor	Coeffi	cient	Standard	1 Error	-	-Ratin P	roh7
LOCTNA		6201	5 casidal (2508		7 78161 0	้าวัวี่
		1127	.2.	4626	-	1 70167 /	501
LUGINAL	4	H413/	- 24	1030	-	-1./3101.(
LUGINAZ	-, 5	10522	. 24	4197	-	-3.7410[.(NT
LOGPHIL	1.	5669	.73	3686		2.1265[.(12.2.1
LOGSNG	8	3633	. 68	3739	-	-1.2167[.2	230]
LOGSNG1	. 8	35755	. 52	2338		1.6385[.]	108]
COGONGE		-					_

.

ECM LAG 4.txt dLOGSNG2 1.4997 52216 2.8722[.006] 2.9215[.005] dC 7.4896 2.5636 ecm(-1).23786 .073045 -3.2564[.002] List of additional temporary variables created: dLOGMLY = LOGMLY-LOGMLY(-1)dLOGINA = LOGINA-LOGINA(-1) dLOGINA1 = LOGINA(-1)-LOGINA(-2) dLOGINA2 = LOGINA(-2)-LOGINA(-3) dLOGPHIL = LOGPHIL-LOGPHIL(-1) dLOGSNG = LOGSNG-LOGSNG(-1) dLOGSNG1 = LOGSNG(-1) - LOGSNG(-2)dLOGSNG2 = LOGSNG(-2) - LOGSNG(-3)dC = C - C(-1)ecm = LOGMLY-.20999*LOGINA + .72454*LOGPHIL + 5.3620*LOGSNG -31.4871* **R-Squared** .55740 **R-Bar-Squared** S.E. of Regression Mean of Dependent Variable 44148 .094717 F-stat. 8. F(45) 6.6117[.000] S.D. of Dependent Variable .010080 .12674 Residual Sum of Squares 37680 Equation Log-likelihood 57.4331 Akaike Info. Criterion 45.4331 Schwarz Bayesian Criterion DW-statistic 1.9873 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGMLY and in cases where the error correction model is highly restricted, these measures could become negative. A Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGMLY 54 observations used for estimation from 199101 to 200402 *************** ******* Coefficient Regressor Standard Error .18544 T-Ratio[Prob] LOGMLY(-1) LOGMLY(-2) .80606 4.3467[.000] -1.2714[.212] 1.2645[.215] -.37646[.709] -.26563 .20894 LOGMLY(-3).24204 .19141 LOGMLY(-4).057873 .15373 LOGINA -.63950 .32370 -1.9756[.056] LOGINA(-1).55425[.583] -1.3894[.174] 1.8858[.068] .31406[.755] 2.0806[.045] .22833 .41196 LOGINA(-2) .55403 .39876 LOGINA(-3) .88829 .47106 LOGINA(-4) .12528 .39889 LOGPHIL 1.7055 81973 2.0806[.045] -1.2077[.235] .068447[.946] -1.3835[.176] .99942[.325] -.32218[.749] .051250[.959] .14459[.886] -.82413[.416] -1.0384[.306] 2.1877[.036] LOGPHIL(-1)-1.32481.0969 LOGPHIL(-2) .074116 1.0828 LOGPHIL(-3) -1.39961.0116LOGPHIL(-4).74338 .74380 LOGSNG .27443 .851.80 _OGSNG(~1) .041548 .81070 _OGSNG(-2) .11408 .78898 .0GSNG(-3) -.63591 .77161 .0GSNG(-4)-.66288 .63835 8.4447 3.8600 2.1877[.036] *************** -Souared . 91316 **R-Bar-Squared** .86462 .E. of Regression F-stat. F(19, 34) 18 S.D. of Dependent Variable .098021 18.8160[.000] ean of Dependent Variable 4.5040 .26641 esidual Sum of Squares .32668 Equation Log-likelihood 61.2870 kaike Info. Criterion 41.2870 Schwarz Bayesian Criterion tistic 1.9110 N-statistic

ECM LAG 4.txt Diagnostic Tests ----5-Test Statistics * LM Version - 5-******** F Version ** -A:Serial Correlation*CHSQ(÷ 4)= 17.9550[.001]*F(2 4. 30)= 3.7360[.014]* * B:Functional Form *CHSQ(1)= .0043931[.947]*F(33)= .0026849[.959]* * 1, يو. * C:Normality *CHSQ(2) =.50056[.779]* Not applicable ÷ ÷. D:Heteroscedasticity*CHSQ(* 1.2111[.271]*F(1) =************ 1. 52)= 1.1930[.280]* ***** ***** A:Lagrange multiplier test of residual serial correlation ****** B:Ramsey's RESET test using the square of the fitted values C:Based on a test of skewness and kurtosis of residuals D:Based on the regression of squared residuals on squared fitted values 1 Estimated Long Run Coefficients using the ARDL Approach ARDL(4,4,4,4) selected Dependent variable is LOGMLY 54 observations used for estimation from 199101 to 200402 Rearessor Coefficient Standard Error LOGINA T-Ratio[Prob] .17563 .81706 2.3535 .21495[.831] -.31075[.758] -1.7340[.092] LOGPHIL -.73134 LOGSNG -5.1472 2.9684 30.6625 19.8102 1.5478 .131 Error Correction Representation for the Selected ARDL Model ARDL(4,4,4,4) selected ********** Dependent variable is dLOGMLY 54 observations used for estimation from 199101 to 200402 Coefficient Standard Error dLOGMLY1 T-Ratio[Prob] .081466 -Kaciolinos -48118[.633] -1.2576[.216] .37646[.709] -1.9756[.056] -1.5408[.132] -3.3951[.002] .16930 dLOGMLY2 -.18417 .14644 dlogmly3 .057873 .15373 **dLOGINA** -.63950 .32370 dlogina1 -.45954 .29824 dlogina2 -1.5408[.132] -3.3951[.002] -.31406[.755] 2.0806[.044] .68085[.500] .85818[.396] -.99942[.324] -.32218[.749] 1.8188[.077] 2.1512[.038] 1.0384[.306] -1.0136.29854 dLOGINA3 -.12528. 39889 **dlogphil** 1.7055 .81973 dLOGPHIL1 .58211 .85497 dLOGPHIL2 .65622 .76467 dLOGPHIL3 -.74338 .74380 ILOGSNG -.27443 .85180 ILOGSNG1 1.1847 .65137 LOGSNG2 1.2988 .60375 LOGSNG3 .66288 . 63835 C 8.4447 3.8600 2.1877[.035] cm(-1) -.27541 .10142 -2.7154[.010] ist of additional temporary variables created: LOGMLY = LOGMLY - LOGMLY(-1)LOGMLY1 = LOGMLY(-1)-LOGMLY(-2)-OGMLY2 = LOGMLY(-2)-LOGMLY(-3)-OGMLY3 = LOGMLY(-3) - LOGMLY(-4)_OGINA = LOGINA-LOGINA(-1) OGINA1 = LOGINA(-1) - LOGINA(-2).OGINA2 = LOGINA(-2)-LOGINA(-3)

ECM LAG 4.txt dLOGINA3 = LOGINA(-3) - LOGINA(-4)dLOGPHIL = LOGPHIL-LOGPHIL(-1)dLOGPHIL1 = LOGPHIL(-1)-LOGPHIL(-2) dLOGPHIL2 = LOGPHIL(-2)-LOGPHIL(-3) dLOGPHIL3 = LOGPHIL(-3)-LOGPHIL(-4) dLOGSNG = LOGSNG-LOGSNG(-1)dLOGSNG1 = LOGSNG(-1) - LOGSNG(-2)dLOGSNG2 = LOGSNG(-2) - LOGSNG(-3)dLOGSNG3 = LOGSNG(-3) - LOGSNG(-4)dC = C - C(-1).73134*LOGPHIL + ecm = LOGMLY-.17563*LOGINA + 5.1472*LOGSNG -30.6625* R-Squared .61627 **R-Bar-Squared** 40183 S.E. of Regression Mean of Dependent Variable .098021 F-stat. F(16, 37) S.D. of Dependent variable 3.4128[.001] .010080 .12674 Residual Sum of Squares .32668 Equation Log-likelihood 61.2870 Akaike Info. Criterion 41,2870 Schwarz Bayesian Criterion 21.3971 DW-statistic 1.9110 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGMLY and in cases where the error correction model is highly restricted, these measures could become negative. ſ PHIL Autoregressive Distributed Lag Estimates ARDL(1,4,0,4) selected based on Akaike Information Criterion Dependent variable is LOGPHIL 54 observations used for estimation from 199101 to 200402 ********** Coefficient Regressor Standard Error .077218 T-Ratio[Prob] T-Ratio[Prob] 11.4712[.000] 2.1397[.038] .30939[.759] -.94694[.349] 1.3731[.177] -2.3990[.021] 2.7886[.008] .24913[.805] 1.0365[.306] -2.1922[.034] .88579 LOGPHIL(-1) LOGINA .10950 .051176 LOGINA(-1) .022981 .074278 LOGINA(-2) 071544 -.067748LOGINA(-3) .10113 .073646 LOGINA(-4) -.12665.052792 LOGMLY .048030 .017224 LOGSNG .032941 .13223 LOGSNG(-1).13572 .13095 LOGSNG(-2)-.27901 -2.1922[.034] 1.2406[.222] 1.2993[.201] .12727 .15325 LOGSNG(-3).12352 LOGSNG(-4) .10268 .13340 . 66848 . 53919 -1.2398[.222] 99403 R-Squared **R-Bar-Squared** 99228 S.E. of Regression Mean of Dependent Variable F-stat. F(12, 41) 568.4722[.000] S.D. of Dependent_Variable .20608 .018110 4.4412 .20608 Residual Sum of Squares Akaike Info. Criterion .013447 Equation Log-likelihood 147.4232 134.4232 Schwarz Bayesian Criterion 121.4948 W-statistic Durbin's h-statistic 2.1704 -.76038[.447] Diagnostic Tests ****** Test Statistics * ÷ LM Version F Version * A:Serial Correlation*CHSQ(2.5018[.644]*F(4)= 4, .44937[.772]* 37)= . مرتب B:Functional Form *CHSQ(1) =1.0631[.303]*F(1, 40)= .80332[.375]* Page 8

	ECM	LAG 4.txt	
	* *	730505 064]*	Not applicable *
* C:NOrmality *	*CHSQ(2)= .0.		
* D:Heteroscedasticity	*CHSQ(1)= .0.	LU391[.919]~F(1	, 52)= .010008[.921]*
A:Lagrange multiplic B:Ramsey's RESET tes C:Based on a test of D:Based on the regre	er test of reside st using the squa f skewness and ke ession of square	ual serial correlat are of the fitted y urtosis of residua d residuals on squa	tion values ls ared fitted values
8			
Estimated 1 ARDL(1,4,0,4)	Long Run Coeffic selected based	ients using the ARI	DL Approach ion Criterion
penendent variable is	LOGPHIL		
54 observations used	for estimation f	rom 1991Q1 to 2004)2 ***********************
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
LOGINA	.34331	.045051	1 7016[096]
	1.5436	1.4650	1.0537[.298]
C	-5.8530	7.6462	76547[.448]
**************************************	*****	*****	**********************
D			
Error Correction R(ARDL(1,4,0,4)	epresentation fo selected based (r the Selected ARD	∟ Model ion Criterion
Dependent variable is	dLOGPHIL		
54 observations used	for estimation f	rom 1991Q1 to 20040	Q2 *******************
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
dLÕGINA	.10950	.051176	2.1397[.038]
dLOGINAL dLOGINA2	025522	.050071	.50973[.613]
dLOGINA3	.12665	.052792	2.3990[.021]
dLOGMLY	.048030	.017224	2.7886[.008]
dLOGSNG dLOGSNG1	.032941	.13223	067916[.946]
dLOGSNG2	28665	.10322	-2.7772[.008]
dLOGSNG3	13340	.10268	-1.2993[.201]
dC	66848	.53919	
ecm(~1)	11421 **********	.V//210 *************	-1.4/91[.140]
List of additional ter	mporary variable	s created:	
dLOGPHIL = LOGPHIL-LO	GPHIL(-1)		
dLOGINA = LOGINA-LOGI	NA(-1)		
dlogINAI = LOGINA(-1) dlogINA2 = LOGINA(-2)	-LOGINA(-3)		
dLOGINA3 = LOGINA(-3)	-LOGINA(-4)		
dLOGMLY = LOGMLY-LOGM	LY(-1)		
$1 \log SNG = LOGSNG - LOGSNG(-1)$	-LOGSNG(-2)		
LOGSNG2 = LOGSNG(-2)	-LOGSNG(-3)		
LOGSNG3 = LOGSNG(-3)	-LOGSNG(-4)		
$ C = C - C(-1) _{Cm} = 10GPHT1 - 343$	31*1 OGTNA - 42	053*LOGMLY -1.54	36*LOGSNG + 5.8530*C
	*****	*****	**********
-Squared	.39207	R-Bar-Squared	
.E. OT REGRESSION	.018110 iahle 012620	S D of Dependent	, 45) 2.0442[.015] t Variable .020429
esidual Sum of Squar	es .013447	Equation Log-like	elihood 147.4232
kaike Info. Criterio	n 134.4232	Schwarz Bayesian	Criterion 121.4948
N-statistic	2.1704	**********	******

restricted, these measures could become negative. П Autoregressive Distributed Lag Estimates ARDL (4, 4, 4, 4) selected Dependent variable is LOGPHIL 54 observations used for estimation from 199101 to 200402 T-Ratio[Prob] Coefficient Standard Error Rearessor 5.2297[.000] .29767[.768] .21100[.834] -.20131[.842] 1.9779[.056] .16433 .85938 LOGPHIL(-1) LOGPHIL(-2) LOGPHIL(-3) .21310 .063433 .20474 .043199 -.029917 .14861 LOGPHIL(-4) .063777 .12614 LOGINA .012790 .15691[.876 .081512 LOGINA(-1)-.76719[.448 .79926[.430 -1.7375[.091 .080084 LOGINA(-2) -.061439.096649 LOGINA(-3) .077248 -.13107 .075435 LOGINA(-4) 2.0806[.045] .066220 .031828 LOGMLY LOGMLY(-1) LOGMLY(-2) LOGMLY(-3) -.53217[.598] .045388 .28891[.774 .45969[.649] -1.0082[.321] -.16084[.873] .042086 .012159 .038473 .017686 .029911 LOGMLY(-4) -.030155 .16804 -.027027 LOGSNG .14726 .15774 .93354[.357 LOGSNG(-1)-1.4929[.145] 1.0801[.288] 1.0973[.280] .15065 LOGSNG(-2)-.22491 .15099 LOGSNG(-3).16308 LOGSNG(-4) .12556 .13777 .79779 -1.1197[.271] -.89332 .99436 **R-Bar-Squared** 99122 R-Squared S.E. of Regression Mean of Dependent Variable Residual Sum of Squares F-stat. F(19, 34) 315.7497[.000] S.D. of Dependent Variable .20608 .019315 .20608 4.4412 Equation Log-likelihood .012684 149.0000 109.1102 Schwarz Bayesian Criterion Akaike Info. Criterion 129.0000 2.1439 DW-statistic Diagnostic Tests Test Statistics * * F Version LM Version -5-***** يد ** 4)= 11.4197[.022]*F(4, 30)= 2.0114[.118]* A:Serial Correlation*CHSQ(s. 1.2200[.269]*F(.76280[.389]* 33)= *CHSQ(1. ÷ B:Functional Form 1) =2. ÷ *CHSQ(Not applicable C:Normality 2) =1.6576[.437]* D:Heteroscedasticity*CHSQ(1)= . .35303[.555]* .36414[.546]*F(1, 52)= A:Lagrange multiplier test of residual serial correlation B:Ramsey's RESET test using the square of the fitted values C:Based on a test of skewness and kurtosis of residuals D:Based on the regression of squared residuals on squared fitted values Estimated Long Run Coefficients using the ARDL Approach ARDL(4,4,4,4) selected ependent variable is LOGPHIL 4 observations used for estimation from 199101 to 200402

ECM LAG 4.txt R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGPHIL and in cases where the error correction model is highly

ECM LAG 4.txt Regressor Coefficient Standard Error .099798 T-Ratio[Prob] LOĞINA .37038 3.7113[.001] .63313[.531] .44827[.657] .38997[.699] LOGMLY .65336 1.0320 LOGSNG 3.0695 6.8476 -13.977935.8431 ********** ******* Π Error Correction Representation for the Selected ARDL Model ARDL(4,4,4,4) selected Dependent variable is dLOGPHIL 54 observations used for estimation from 199101 to 200402 Regressor Coefficient Standard Error T-Ratio[Prob] dLOGPHIL1 -.076715 .16910 -.45366[.653] -.087220[.931] dLOGPHIL2 -.013282 .15228 -.087220[.931] .20131[.842] 1.9779[.055] 2.0052[.052] .79803[.430] 1.7375[.091] 2.0806[.044] .0092809[.993] .42353[.674] 1.0082[.320] - 16084[.873] dLOGPHIL3 .029917 14861 **dlogina** .12614 .063777 dlogina1 .11526 .057481 dlogina2 .053821 .067443 dlogina3 .13107 .075435 **dlogmly** 066220 .031828 dlogmly1 .3107E-3 .033474 dlogmly2 .012470 .029442 dlogmly3 .030155 .029911 dLOGSNG -.027027 .16804 -.16084[.873 dLOGSNG1 -.075939 -.56748[.574] -2.5973[.013] -1.0973[.280] .13382 dLOGSNG2 -.30085 .11583 dlogsng3 -.1377712556 dC -.89332 .79779 -1.1197[.270] ecm(-1) -.063910 .11691 -.54665[.588] ******* List of additional temporary variables created: dLOGPHIL = LOGPHIL-LOGPHIL(-1) dLOGPHIL1 = LOGPHIL(-1)-LOGPHIL(-2) dLOGPHIL2 = LOGPHIL(-2)-LOGPHIL(-3) dLOGPHIL3 = LOGPHIL(-3)-LOGPHIL(-4) LOGINA = LOGINA-LOGINA(-1) LOGINA1 = LOGINA(-1)-LOGINA(-2)LOGINA2 = LOGINA(-2)-LOGINA(-3)LOGINA3 = LOGINA(-3)-LOGINA(-4) LOGMLY = LOGMLY - LOGMLY(-1)LOGMLY1 = LOGMLY(-1) - LOGMLY(-2) LOGMLY2 = LOGMLY(-2) - LOGMLY(-3) LOGMLY3 = LOGMLY(-3) - LOGMLY(-4)LOGSNG = LOGSNG-LOGSNG(-1)LOGSNG1 = LOGSNG(-1)-LOGSNG(-2) LOGSNG2 = LOGSNG(-2)-LOGSNG(-3) -OGSNG3 = LOGSNG(-3) - LOGSNG(-4)C = C - C(-1)-.37038*LOGINA cm = LOGPHIL -3.0695*LOGSNG + -.65336*LOGMLY 13.9779*c -Squared 42656 R-Bar-Squared 10611 E. of Regression an of Dependent Variable F-stat. F(16, 37) S.D. of Dependent Variable Equation Log-likelihood .019315 1.5807[.124] .012620 .020429 sidual Sum of Squares aike Info. Criterion 012684 149.0000 129.0000 Schwarz Bayesian Criterion 109.1102 v-statistic 2.1439 -Squared and R-Bar-Squared measures refer to the dependent variable _OGPHIL and in cases where the error correction model is highly

estricted, these measures could become negative.

١G

ECM LAG 4.txt

م ,ARDL(2,0,4 *********	utoregressive Dist 0) selected based (ributed Lag Estimates	5 1 Criterion
Dependent variable 54 observations use	is LOGSNG d for estimation fu	rom 1991Q1 to 2004Q2	*****
Regressor LOGSNG(-1) LOGSNG(-2) LOGINA LOGMLY LOGMLY(-1) LOGMLY(-2) LOGMLY(-3) LOGMLY(-4) LOGPHIL C	Coefficient .50571 .22333 .032622 011223 .016658 .072802 0058018 067488 041321 1.2617	Standard Error .11635 .11061 .027446 .025574 .034731 .034444 .034460 .024587 .080002 .40101	T-Ratio[Prob] 4.3463[.000] 2.0190[.050] 1.1886[.241] 43883[.663] .47962[.634] 2.1137[.040] 16836[.867] -2.7448[.009] 51650[.608] 3.1462[.003]
R-Squared S.E. of Regression Mean of Dependent V Residual Sum of Squ Akaike Info. Criter DW-statistic	.83310 .019498 ariable 4.5541 ares .016727 ion 131.5290 2.2088	R-Bar-Squared F-stat. F(9, S.D. of Dependent V Equation Log-likeli Schwarz Bayesian Cr	.79896 44) 24.4031[.000] ariable .043486 hood 141.5290 riterion 121.5841
	Diagnost	ic Tests	
*******************	************	******	****
**************************************	LM VEISI	011 ~ ****************	F VERSION *
* A:Serial Correlati	* *CHSQ(4)= 6.	7029[.152] [*] _* F(4,	40)= 1.4172[.246]**
B:Functional Form	*CHSQ(1)= .7	8050[.377]*F(1,	43)= .63062[.431]*
C:Normality	*CHSQ(2)= 10.	6584[.005] [*] * No	t applicable *
D:Heteroscedastici	ty*CHSQ(1)= .7	2490[.395]*F(1,	52)= .70755[.404]*
A:Lagrange multip B:Ramsey's RESET C:Based on a test D:Based on the re	lier test of residu test using the squa of skewness and ku gression of squared	al serial correlatio re of the fitted val rtosis of residuals residuals on square	n ues d fitted values
Estimate ARDL(2,0,4,(d Long Run Coeffici)) selected based of	ents using the ARDL . n Akaike Information	Approach Criterion
<pre>>pendent variable } observations used </pre>	is LOGSNG for estimation fr	om 1991Q1 to 2004Q2	*******
}gressor)GINA)GMLY)GPHIL	Coefficient .12039 .018258 15250	Standard Error .097971 .061572 .28836	T-Ratio[Prob] 1.2289[.226] .29654[.768] 52883[600]
******	4.6562	.76939	6.0519[.000]

ECM LAG 4.txt

54 observations used	for estimation fro	M 1991Q1 LO 2004Q2	*****
Pogrossor	Coefficient	Standard Error	T-Ratio[Prob]
di ocenci	- 22333	.11061	-2.0190[.049]
di OCTNA	032622	.027446	1.1886[.241]
	- 011223	.025574	43883[.663]
	4877E-3	.023484	.020768[.984]
	073290	.022628	3.2390[.002]
	067488	. 024587	2.7448[.009]
	- 041321	.080002	51650[.608]
	1 2617	.40101	3.1462[.003]
ac	- 27097	.061573	-4.4007[.000]
ecm(-1)	*****	*************	*****************
List of additional t dLOGSNG = LOGSNG-LOO dLOGSNG1 = LOGSNG(-1) dLOGINA = LOGINA-LOO dLOGMLY = LOGMLY-LOO dLOGMLY1 = LOGMLY(-1) dLOGMLY2 = LOGMLY(-2) dLOGMLY3 = LOGMLY(-3) dLOGMLY3 = LOGMLY(-3) dLOGMLY3 = LOGPHIL-L	emporary variables SNG(-1) .)-LOGSNG(-2) SINA(-1) SMLY(-1) L)-LOGMLY(-2) 2)-LOGMLY(-3) 3)-LOGMLY(-4) LOGPHIL(-1)		
dC = C - C(-1)	39*1 OCTNA - 01825	R*LOGMLY + .15250*L	.0GPHIL -4.6562*C
ecm = LOGSNG120		*****	****
p. Causred	. 55823	R-Bar-Squared	. 46787
s s of Regression	.019498	F-stat. F(8, 4	6.9500[.000]
Mean of Dependent Va	ariable0018173	s.D. of Dependent Va	ariable .026729
Residual Sum of Squa	ares .016727	Equation Log-likelik	100d 141.5290
Akaike Info. Criter	ion 131.5290	Schwarz Bayesian Cri	iterion 121.5841
nw-statistic	2.2088		and a second
****	***************	****	
R-Squared and R-Bar dLOGSNG and in cases restricted, these m	-Squared measures re s where the error co easures could become	efer to the dependent orrection model is hi e negative.	ighly
Autoregressive Di	stributed Lag Estim ARDL(4,4,4,	ates 4) selected	4
****	****	******************	*****************
ependent variable 4 observations use	is LOGSNG d for estimation fr ******	om 199101 to 200402	****
earessor	Coefficient	Standard Error	T-Ratio[Prob]
2GSNG(-1)	.47589	.14108	3.3733[.002]
GSNG(-2)	.20203	.15483	1.3049[.201]
GSNG(-3)	034345	.15655	21939[.828]
χ GSNG(-4)	. 040759	.13016	, 31312[./20]
GINA	.051518	.068137	./3609[.433]
)GINA(-1)	0041739	.08318/	
NOTING (2)	000074		- 641491 4001
XJINA(-2)	-,068634	.081563	11581 0081
MINA(-2) MINA(-3)	068634 .011526	.081563	.11584[.908]
GINA(-2) GINA(-3) GINA(-4)	068634 .011526 .065371	.081563 .099506 .079518	.11584[.908] .82209[.417] .32218[.749]
XJINA(-2) XGINA(-3) XGINA(-4) XGMLY	068634 .011526 .065371 011091	.081563 .099506 .079518 .034424	.11584[.908] .82209[.417] 32218[.749] 078693[938]
XJINA(-2) XGINA(-3) XGINA(-4) XGMLY XGMLY(-1)	068634 .011526 .065371 011091 .0036587	.081563 .099506 .079518 .034424 .046494	.11584[.908] .82209[.417] 32218[.749] .078693[.938] 1.7399[.091]
XJINA(-2) XGINA(-3) XGINA(-4) XGMLY XGMLY(-1) XGMLY(-2)	068634 .011526 .065371 011091 .0036587 .071673	.081563 .099506 .079518 .034424 .046494 .041195	.11584[.908] .82209[.417] 32218[.749] .078693[.938] 1.7399[.091] 26757[.791]
XJINA(-2) XGINA(-3) XGINA(-4) XGMLY XGMLY(-1) XGMLY(-2) XGMLY(-3)	068634 .011526 .065371 011091 .0036587 .071673 010524	.081563 .099506 .079518 .034424 .046494 .041195 .039332	.11584[.908] .82209[.417] 32218[.749] .078693[.938] 1.7399[.091] 26757[.791] -1 4412[159]
XJINA(-2) XGINA(-3) XGINA(-4) XGMLY XGMLY(-1) XGMLY(-2) XGMLY(-3) XGMLY(-4)	068634 .011526 .065371 011091 .0036587 .071673 010524 043329	.081563 .099506 .079518 .034424 .046494 .041195 .039332 .030064 .17490	.11584[.908] .82209[.417] 32218[.749] .078693[.938] 1.7399[.091] 26757[.791] -1.4412[.159] 16084[.873]
XJINA(-2) XGINA(-3) XGINA(-4) XGMLY XGMLY(-1) XGMLY(-2) XGMLY(-3) XGMLY(-4) XGMLY(-4) XGMLY(-4) XGMLY(-4) XGMLY(-4) XGMLY(-4) XGMLY(-4) XGMLY(-4) XGMLY(-4) XGMLY(-4) XGMLY(-4) XGMLY(-4) XGMLY(-4) XGMLY(-4) XGMLY(-4) XGMLY(-4) XGMLY(-3) XGMLY(-4) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGMLY(-1) XGML	068634 .011526 .065371 011091 .0036587 .071673 010524 043329 028131	.081563 .099506 .079518 .034424 .046494 .041195 .039332 .030064 .17490 .22310	.11584[.908] .82209[.417] 32218[.749] .078693[.938] 1.7399[.091] 26757[.791] -1.4412[.159] 16084[.873] 80246[.428]
XJINA(-2) XGINA(-3) XGINA(-4) XGMLY XGMLY(-1) XGMLY(-2) XGMLY(-2) XGMLY(-3) XGMLY(-4) XGPHIL XGPHIL(-1)	068634 .011526 .065371 011091 .0036587 .071673 010524 043329 028131 17903	.081563 .099506 .079518 .034424 .046494 .041195 .039332 .030064 .17490 .22310 .21718	.11584[.908] .82209[.417] 32218[.749] .078693[.938] 1.7399[.091] 26757[.791] -1.4412[.159] 16084[.873] 80246[.428] .40268[.690]
XJINA(-2) XGINA(-3) XGINA(-4) XGMLY XGMLY(-1) XGMLY(-2) XGMLY(-3) XGMLY(-4) XGPHIL XGPHIL(-1) XGPHIL(-2) XGPHIL(-2)	068634 .011526 .065371 011091 .0036587 .071673 010524 043329 028131 17903 .087453	.081563 .099506 .079518 .034424 .046494 .041195 .039332 .030064 .17490 .22310 .21718 .20371	.11584[.908] .82209[.417] 32218[.749] .078693[.938] 1.7399[.091] 26757[.791] -1.4412[.159] 16084[.873] 80246[.428] .40268[.690] 1.3394[.189]
XJINA(-2) XGINA(-3) XGINA(-4) XGMLY XGMLY(-1) XGMLY(-2) XGMLY(-3) XGMLY(-4) XGPHIL XGPHIL(-1) XGPHIL(-2) XGPHIL(-3) XGPHIL(-3)	068634 .011526 .065371 011091 .0036587 .071673 010524 043329 028131 17903 .087453 .27284	.081563 .099506 .079518 .034424 .046494 .041195 .039332 .030064 .17490 .22310 .21718 .20371 .14521	.11584[.908] .82209[.417] 32218[.749] .078693[.938] 1.7399[.091] 26757[.791] -1.4412[.159] 16084[.873] 80246[.428] .40268[.690] 1.3394[.189] -1.7645[.087]
XJINA(-2) XGINA(-3) XGINA(-4) XGMLY XGMLY(-1) XGMLY(-2) XGMLY(-3) XGMLY(-4) XGPHIL XGPHIL(-1) XGPHIL(-1) XGPHIL(-3) XGPHIL(-4)	$\begin{array}{r}068634\\ .011526\\ .065371\\011091\\ .0036587\\ .071673\\010524\\043329\\028131\\17903\\ .087453\\ .27284\\25621\\ 1.6245\end{array}$.081563 .099506 .079518 .034424 .046494 .041195 .039332 .030064 .17490 .22310 .21718 .20371 .14521 .14521 .78057	.11584[.908] .82209[.417] 32218[.749] .078693[.938] 1.7399[.091] 26757[.791] -1.4412[.159] 16084[.873] 80246[.428] .40268[.690] 1.3394[.189] -1.7645[.087] 2.0812[.045]
XJINA(-2) XGINA(-3) XGINA(-4) XGMLY XGMLY(-1) XGMLY(-2) XGMLY(-3) XGMLY(-4) XGPHIL XGPHIL(-1) XGPHIL(-2) XGPHIL(-3) XGPHIL(-4)	068634 .011526 .065371 011091 .0036587 .071673 010524 043329 028131 17903 .087453 .27284 25621 1.6245	.081563 .099506 .079518 .034424 .046494 .041195 .039332 .030064 .17490 .22310 .21718 .20371 .14521 .78057	.11584[.908] .82209[.417] 32218[.749] .078693[.938] 1.7399[.091] 26757[.791] -1.4412[.159] 16084[.873] 80246[.428] .40268[.690] 1.3394[.189] -1.7645[.087] 2.0812[.045]
XJINA(-2) XGINA(-3) XGINA(-4) XGMLY XGMLY(-1) XGMLY(-2) XGMLY(-3) XGMLY(-4) XGPHIL XGPHIL(-1) XGPHIL(-2) XGPHIL(-3) XGPHIL(-4) XGPHIL(-4)	068634 .011526 .065371 011091 .0036587 .071673 010524 043329 028131 17903 .087453 .27284 25621 1.6245	.081563 .099506 .079518 .034424 .046494 .041195 .039332 .030064 .17490 .22310 .21718 .20371 .14521 .78057	.11584[.908] .82209[.417] 32218[.749] .078693[.938] 1.7399[.091] 26757[.791] -1.4412[.159] 16084[.873] 80246[.428] .40268[.690] 1.3394[.189] -1.7645[.087] 2.0812[.045]

ECM LAG 4.txt 4.5541 S.D. of Dependent Variable .043486 Mean of Dependent Variable 147.9190 Equation Log-likelihood Residual Sum of Squares 013202 Schwarz Bayesian Criterion 108.0292 127.9190 Akaike Info. Criterion 2.1717 DW-statistic _. *** ******** Diagnostic Tests ÷ * F Version LM Version ÷ Test Statistics --8-** -2 4, .48689[.745]* 3.2919[.510]*F(30) =4)= A:Serial Correlation*CHSQ(÷. * 3.5110[.070]* 5.1928[.023]*F(33)= *CHSQ(1) =1, ÷ **B:Functional** Form 4 ي ا Not applicable 9.4809[.009]* *CHSQ(2)= * c:Normality 2 .079277[.779]* 1) = .082201[.774] * F(1, 52)= D:Heteroscedasticity*CHSQ(********** بالد بالد بالد بالد the star star at ا وقد مالد مالد مالد مالد بالد بال A:Lagrange multiplier test of residual serial correlation B:Ramsey's RESET test using the square of the fitted values C:Based on a test of skewness and kurtosis of residuals D:Based on the regression of squared residuals on squared fitted values 0 Estimated Long Run Coefficients using the ARDL Approach ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 T-Ratio[Prob] Coefficient Standard Error Regressor 1.4961[.144] .44257[.661] -.96984[.339] 5.8819[.000] .11775 .17616 LOGINA .032910 .074361 LOGMLY .33668 -.32652 LOGPHIL 5.1465 .87498 ********************* Error Correction Representation for the Selected ARDL Model ARDL(4,4,4,4) selected **************** ependent variable is dLOGSNG 4 observations used for estimation from 199101 to 200402 ***************************** T-Ratio[Prob] Standard Error Coefficient egressor -1.5740[.124] -.049580[.961] -.31315[.756] .75609[.454] .13243 -.20845.OGSNG1 -.0064139.12936 _OGSNG2 13016 -.040759 .ogsng3 .068137 051518 .OGINA -.13328[.895] -1.1278[.267] -.82209[.416] -.32218[.749] -.0082633 .061998 .OGINA1 .068184 -.076897 .OGINA2 .079518 -.065371 .OGINA3 .034424 -.011091 OGMLY .034014 -.52391[.603] -.017820 .OGMLY1 1.8787[.068] 1.4412[.158] -.16084[.873] -.60473[.549] -.10707[.915] .053853 .028666 .OGMLY2 .030064 .043329 .OGMLY3 .17490 -.028131.OGPHIL .17212 -.10409.OGPHIL1 .15535 .016633 .OGPHIL2 1.7645[.086] 2.0812[.044] -2.6002[.013] .14521 .OGPHIL3 .25621 .78057 1.6245 -.31566 .12140:m(-1) ******* ***********************************

st of additional temporary variables created:

Choosewing = Loosewic (2) - Loosewic (-2) Choosewing = Loosewic (-2) - Loosewic (-2) Choosewing = Loosewic (-2) - Loosewic (-3) Choosewing = Loosewic (-2) - Loosewic (-3) Choosewing = Loosewic (-3) - Loosewic (-4) Choosewing = Loosewic (-3) - Loosewic (-4) Choosewing = Loosewic (-1) - Loosewic (-4) Choosewing = Loosewic (-5) Choosewing = Loosewic (-5) Choosewing = Loosewing = Loosewing (-6) Choosewing = Loosewing (-6) <	dLoGSNG1 = LOGSNG(-1)-LOGSNG(-2) dLoGSNG2 = LOGSNG(-2)-LOGSNG(-2) dLOGSNG3 = LOGSNG(-2)-LOGSNG(-4) dLOGINA1 = LOGINA(-1)-LOGINA(-2) dLOGINA2 = LOGINA(-3)-LOGINA(-4) dLOGMA1 = LOGINA(-3)-LOGINA(-4) dLOGMLY = LOGMLY(-1)-LOGMLY(-1) dLOGMLY = LOGMLY(-1)-LOGMLY(-3) dLOGMLY = LOGMLY(-3)-LOGMLY(-4) dLOGMLY = LOGMLY(-3)-LOGMLY(-4) dLOGMLY = LOGMLY(-3)-LOGMLY(-4) dLOGPHIL = LOGPHIL-(-2)-HOGPHIL(-2) dLOGPHIL = LOGPHIL-(-2)-LOGPHIL(-2) dLOGPHIL = LOGPHIL-(-2)-LOGPHIL(-4) dC = C-C(-1) ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL1 ************************************	.1465*C ******* .45649 7[.000] .026729 47.9190)8.0292
ducesweiz = Lodswe(-1)-LOGsWG(-2) ducesweiz = Lodswe(-2)-LOGSWG(-3) ducesweiz = Lodswe(-2)-LOGSWG(-3) ducesweiz Lodsweiz(-2)-LOGSWG(-3) ducesweiz Lodsweiz(-3)-LOGSWG(-3) ducesweiz Lodsweiz(-3)-LOGSWG(-3) ducesweiz Lodsweiz(-3)-LOGSWG(-3) ducesweiz Lodsweiz(-3)-LOGSWG(-3) ducesweiz Lodsweiz(-3)-LOGSWG(-4) ducesweiz Lodsweiz(-3)-LOGSWG(-2) ducesweiz Lodsweiz(-3)-LOGSWE(-2) ducesweiz Lodsweiz(-3)-LOGSWE(-4) ducesweiz LOGSWE(-2)-LOGWHI(-4) ducesweiz LOGSWE(-3)-LOGWHI(-4) ducesweiz LOGSWE(-3)-LOGWHI(-4) ducesweiz -5133 R-Squared .5133 R-Squared .65133 R-Squared .65133 R-Squared .65133 R-Squared .013705 R-Squared .032710°LOGWHIZ - 3) Settistic .013705 R-Squared .013705 R-Squared .0147.919 Autoregressive Distributed Lag Estimates ARDL(4, 4, 4) Selected<	action cossNG(-1)-LOGSNG(-2) dLOGSNG2 = LOGSNG(-3)-LOGSNG(-4) dLOGINA = LOGINA(-1)-LOGINA(-1) dLOGINA = LOGINA(-1)-LOGINA(-2) dLOGINA2 = LOGINA(-2)-LOGINA(-4) dLOGNA2 = LOGINA(-2)-LOGINA(-4) dLOGMLY1 = LOGMLY(-1)-LOGMLY(-2) dLOGMLY2 = LOGMLY(-2)-LOGMLY(-2) dLOGPHIL = LOGPHIL(-1)-LOGMLY(-2) dLOGPHIL = LOGPHIL(-2)-LOGMLY(-4) dLOGPHIL = LOGPHIL(-2)-LOGMLY(-4) dLOGPHIL = LOGPHIL(-2)-LOGMLY(-4) dLOGPHIL = LOGPHIL(-2)-LOGPHIL(-3) dLOGPHIL = LOGPHIL(-2)-LOGMLY(-4) dLOGPHIL = LOGPHIL(-2)-LOGPHIL(-3) dLOGPHIL = LOGPHIL(-3)-LOGMLY(-4) dLOGPHIL = LOGPHIL(-3)-LOGPHIL(-4) dC = C-C(-1) ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL - R-Squared free .013705 mean of Dependent variable0018173 S.D. of Dependent variable Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1 DW-statistic .1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. 4 .41080 .3733	.1465*C ******* .45649 7[.000] .026729 47.9190)8.0292
dioessNa: = LOBSNG(-2)-LOGSNG(-3) dioessNa: = LOGSNA(-1)-LOGSINA(-2) dioessNa: = LOGSINA(-1)-LOGSINA(-2) dioessNa: = LOGSINA(-2)-LOGSINA(-2) dioessNa: = LOGSINA(-2)-LOGSINA(-2) dioessNa: = LOGSINA(-2)-LOGSINA(-2) dioessNa: = LOGSINA(-2)-LOGSINA(-2) dioessNa: = LOGSINA(-2)-LOGNIY(-2) dioessNa: = LOGSINA(-2)-LOGNIY(-2) dioessNa: = LOGSINA(-2)-LOGNIY(-2) dioessNa: = LOGSINA(-2)-LOGNIY(-3) dioessNa: = LOGSINA(-2)-LOGNIY(-3) dioessNa: = LOGSINA(-2)-LOGNIY(-3) dioessNa: = LOGSINA(-2)-LOGNIY(-3) dioessNa: = LOGSINA(-1)-LOGNIY(-3) dioessNa: = LOGSINA(-2)-LOGNIY(-4)	dLoGSNG3 = LoGSNG(-2)-LoGSNG(-3) dLoGSN3 = LoGSNG(-2)-LoGSNG(-4) dLoGINA1 = LoGINA(-L)GGINA(-1) dLoGINA2 = LOGINA(-2)-LOGINA(-2) dLoGMLY = LOGMLY(-2)-LOGINA(-3) dLOGMLY = LOGMLY(-1)-LOGNLY(-2) dLOGMLY = LOGMLY(-2)-LOGMLY(-3) dLOGPHIL = LOGPHIL(-3)-LOGPHIL(-2) dLOGPHIL = LOGPHIL(-2)-LOGPHIL(-2) dLOGPHIL = LOGPHIL(-2)-LOGPHIL(-3) dLOGPHIL = LOGPHIL(-2)-LOGPHIL(-4) dC = C-C(-1) ecm = LOGSNG17616+LOGINA032910+LOGMLY + .32652*LOGPHIL4 R-Squared .65133 R-Bar-Squared S.E. of Regression .019705 F-stat. F(16, 37) 3.965 Mean of Dependent Variable0018173 S.D. of Dependent Variable Residual Sum of Squares .013202 Equation Log-likelihood 1 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1 DW-statistic .2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 1991Q1 to 2004Q2 Wegressor Coefficient Standard Error T-Ratio OGSNG(-1) .47589 .14008 3.3733 1.3046 OGSNG(-2) .20203 .15483 1.3046 OGSNG(-2) .20203 .15483 1.3046 O	.1465*C ******** .45649 7[.000] .026729 47.9190)8.0292
Chooses Construction Construction Construction	dLOGINA = LOGINA(-1)-LOGINA(-1) dLOGINA = LOGINA(-1)-LOGINA(-2) dLOGINA2 = LOGINA(-1)-LOGINA(-2) dLOGINA2 = LOGINA(-3)-LOGINA(-4) dLOGMLY1 = LOGMLY(-1)-LOGMLY(-2) dLOGMLY2 = LOGMLY(-2)-LOGMLY(-2) dLOGPHIL = LOGPHIL(-1)-LOGPHIL(-2) dLOGPHIL2 = LOGPHIL(-1)-LOGPHIL(-2) dLOGPHIL3 = LOGPHIL(-2)-LOGPHIL(-3) dLOGPHIL3 = LOGPHIL(-3)-LOGPHIL(-4) dC = C-C(-1) etm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL - etm = LOGSNG17616*LOGINA031202 Equation LOG-likelihood 1 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1 PW-statistic 2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 1991Q1 to 200402 ************************************	.1465*C ******** .45649 7[.000] .026729 47.9190)8.0292
GLOGINA = LOGINA(-1)-COGINA(-2) GLOGINA = LOGINA(-1)-COGINA(-2) GLOGINA = LOGINA(-2)-LOGINA(-3) GLOGINA = LOGINA(-3)-COGINA(-4) GLOGINA = LOGINA(-1)-COMPTI(-1) GLOGINA = LOGINA(-3)-COGINA(-4) GLOGINI = LOGINA(-3)-COGINA(-4) GLOGINI = LOGINA(-3)-COGINA = .032910*LOGMLY + .32652*LOGPHIL -5.14655 CC = C-C(-1) GENE = COGING = .17616*LOGINA = .032910*LOGMLY + .32652*LOGPHIL -5.14655 ReSidual Sim of Squares .013705 F-stat F(16, 37) 3.9697[.000 Residual Sim of Squares .013202 Equation Log-likelihood 147.919 Ow-statistic	dLOGINA1 = LOGINA(-2)-LOGINA(-2)dLOGINA3 = LOGINA(-2)-LOGINA(-3)dLOGINA3 = LOGINA(-2)-LOGNA(-3)dLOGMLY = LOGMLY(-1)-LOGMLY(-1)dLOGMLY = LOGMLY(-1)-LOGMLY(-2)dLOGMLY = LOGMLY(-2)-LOGMLY(-3)dLOGPHIL = LOGPHIL(-1)-LOGPHIL(-1)dLOGPHIL = LOGPHIL(-2)-LOGMLY(-4)dLOGPHIL = LOGPHIL(-2)-LOGPHIL(-3)dLOGPHIL = LOGPHIL(-3)-LOGPHIL(-4)dC = C-C(-1)ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHILR-Squared .65133 R-Bar-Squared .5.E. of Regression .019705 F-stat. F(16, 37) 3.965Mean of Dependent variable0018173 S.D. of Dependent variableResidual Sum of Squares .013202 Equation Log-likelihood 1Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1DW-statistic .2.1717R-Squared and R-Bar-Squared measures refer to the dependent variabledLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative.Matoregressive Distributed Lag Estimates ARDL(4,4,4,4) SelectedDependent variable is LOGSNG S4 observations used for estimation from 199101 to 200402Hegressor COGSNG(-2) .20203 .15483 1.3046OGSNG(-2) .20203 .15483 1.3046OGSNG(-2) .20203 .15483 1.3046OGSNG(-3) .2.0203 .15483 1.3046OGSNG(-4) .2.0203 .15483 1.3046OGSNG(-2) .2.0203 .15483 1.3046<	.1465*C ******** .45649 7[.000] .026729 47.9190)8.0292
LLOGINAL = LDGINA(-2)-LOGINA(-2) LLOGINAL = LDGINA(-2)-LOGINA(-3) LLOGINAL = LDGINA(-3)-LOGINA(-4) LLOGMLY1 = LDGMLY(-1)-LOGMLY(-2) LLOGMLY2 = LDGMLY(-2)-LOGMLY(-2) LLOGMLY2 = LDGMLY(-2)-LOGMLY(-4) LLOGPHIL = LOGPHIL(-1)-LOGPHIL(-1) LLOGPHIL = LOGPHIL(-1)-LOGPHIL(-3) LLOGPHIL = LOGPHIL(-3)-LOGMLY(-4) LLOGPHIL = LOGPHIL(-3)-LOGHLY + .32652*LOGPHIL -5.14655 R-Squared .55133 R-Bar-Squared .019705 F-Stat. F(16, 37) 3.9697[.006, 147, 919 Residual Sum of Squares .01320 Equation Log-likelihood .147, 919 Akaike Info. Criterion 127, 9190 Schwarz Bayesian Criterion 147, 919 Akaike Info. Criterion 127, 9190 Schwarz Bayesian Criterion 108, 029 R-Squared and R-Bar-Squared measures refer to the dependent variable .02672 Akaike Info. Criterion 2.1717 Autoregressive Distributed Lag Estimates ARDL(4, 4, 4, 4) Selected Dependent variable is LOGSNG S4 observations used for estimation from 199101 to 200402 Kegressor Coefficient Standard Froor T-Ratio Prob OGSNG(-2) .0203 .1318; 008187 .7333[.002] OGSNG(-2) .034345 .15655 .13048[.002] GSINA(-1) .0045138 .088187 .73610, 4561 GSINA(-1) .004573 .048187 .75609.413048 GSINA(-1) .004573 .048187 .75609.4149 GSINA(-2) .071673 .048195 .050174(.963) GSINA(-2) .071673 .048195 .050174(.963) GSINA(-2) .071673 .048195 .050174(.963) GSINA(-2) .071673 .048195 .050174(.963) GSINA(-2) .071673 .044195 .078184 .82204 GSINA(-1) .003587 .046494 .031318 .078142 .82218 GSINA(-2) .071673 .041195 .078184 .82204 GSINA(-2) .071673 .041195 .078184 .82204 GSINA(-2) .071673 .041195 .078184 .82204 GSINA(-2) .071673 .041195 .078144 .82204 GSINA(-2) .087453 .21718 .0	dLOGINA2 = LOGINA(-1)-LOGINA(-2) dLOGINA2 = LOGINA(-2)-LOGINA(-4) dLOGMLY = LOGMLY-LOGMLY(-1) dLOGMLY = LOGMLY(-1)-LOGMLY(-2) dLOGPHIL = LOGPHIL(-1)-LOGMLY(-4) dLOGPHIL = LOGPHIL(-1)-LOGPHIL(-2) dLOGPHIL = LOGPHIL(-2)-LOGPHIL(-3) dLOGPHIL = LOGPHIL(-2)-LOGPHIL(-3) dLOGPHIL = LOGPHIL(-2)-LOGPHIL(-4) dC = c-C(-1) ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL - ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL - ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL - R-Squared .65133 R-Bar-Squared S.E. of Regression .019705 F-stat. F(16, 37) 3.965 Residual Sum of Squares .013202 Equation Log-likelihood 1 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 Hegressor Coefficient Standard Error T-Ratio OGSNG(-1) .47589 .14108 3.3733 OGSNG(-2) .0203 .15483 .1.3048 OGSNG(-3) .031345 .15655 .21936 OGSNG(-4) .040759 .13016 .31315 OGINA .051518 .068137 .75600 OGINA(-1) .0041739 .083167 .05017 OGSNG(-3) .011526 .099506 .11528 NGINA(-4) .065371 .072518 .1565 .1555 .1158 NGINA(-4) .065371 .072518 .1565 .1555 .1158 NGINA(-1) .011526 .099506 .11588 NGINA(-4) .065371 .072518 .1565 .1555 .1158 NGINA(-1) .011526 .099506 .11588 NGINA(-1) .011526 .099506 .11588 NGINA(-4) .065371 .072518 .1565 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555 .1555	.1465*C ******** .45649 7[.000] .026729 47.9190)8.0292
ULOSINAZ = LOGINA(-2)-LOGINA(-3) ULOSINAZ = LOGMLY(-3)-LOGMLY(-3) ULOGMLY = LOGMLY(-1)-LOGMLY(-2) ULOMLY = LOGMLY(-2)-LOGMLY(-3) ULOMLY = LOGNLY(-3)-LOGMLY(-4) ULOCPHIL = LOGPHIL(-1)-LOGHIL(-2) ULOCPHIL = LOGPHIL(-1)-LOGHIL(-3) ULOMLY = LOGNL(-1)-LOGHIL(-4) dc = C-C(-1) ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL -5.1465* s.E. of Regression .019705 F-stat F(16, 37) 3.96376.000 Mean of Dependent Variable .0018173 S.D. of Dependent Variable .02672 Akaike Info. Criterion 127.9105 CHWarz Bayesian Criterion 108.029 Akaike Info. Criterion 127.9105 CHWarz Bayesian Criterion 108.029 Akaike and n-Bar-Squared measures refer to the dependent variable .02672 Actoregressive Distributed Lag Estimates	dLOGINA(-2)-LOGINA(-3)dLOGINA3 = LOGINA(-2)-LOGINA(-4)dLOGMLY = LOGMLY(-1)-LOGMLY(-2)dLOGMLY2 = LOGMLY(-2)-LOGMLY(-3)dLOGPHIL = LOGPHIL(-1)-LOGPHIL(-1)dLOGPHIL = LOGPHIL(-1)-LOGPHIL(-2)dLOGPHIL = LOGPHIL(-1)-LOGPHIL(-2)dLOGPHIL = LOGPHIL(-1)-LOGPHIL(-3)dLOGPHIL = LOGPHIL(-1)-LOGPHIL(-4)dC = c-C(-1)ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL -ecm = LOGSNG17616*LOGINA0018173 S.D. of Dependent variableAkaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1Dw-statistic	.1465*C ******** .45649 7[.000] .026729 47.9190)8.0292
dLOGINAS = LOGINA(-3) -LOGINA(-4) dLOGMLY = LOGMLY(-1) -LOGMLY(-2) dLOGMLY = LOGMLY(-2) -LOGMLY(-2) dLOGMLY = LOGMLY(-2) -LOGMLY(-3) dLOGPHIL = LOGPHIL(-2) -LOGMLY(-4) dLOGPHIL = LOGPHIL(-1) -LOGMENT(-4) dLOGPHIL = LOGPHIL(-3) -LOGMENT(-4) dLOGNE = C-C(-1) erm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL - 5.14655 R-Squared .01320 F-stat. F(16, 37) 3.9697[.008.029 Residual Sum of Sequares .01320 Equation Log-1ikelihood .147.919 Akike Info. Criterion .127.9190 Schwarz Bayesian Criterion .08.029 Mean of Dependent Variable error correction model is highly restricted, these measures could become negative. R-Squared and R-Bar-Squared measures refer to the dependent variable duGSSG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates .ARDL(4, 4, 4, 4) Selected Dependent variable is LOGSNG .13316 .002 GSING(-2) .20203 .11408 3.3733[.002] OGSNG(-2) .20203 .11408 3.3733[.002] OGSNG(-2) .20203 .11408 3.3733[.002] OGSNG(-2) .20203 .13485 3.33316 .002] <	dLOGINAS = LOGINA(-3)-LOGINA(-4) dLOGMLY = LOGMLY-(-1)-LOGMLY(-2) dLOGMLY1 = LOGMLY(-2)-LOGMLY(-3) dLOGPHIL = LOGPHIL(-1)-LOGPHIL(-1) dLOGPHIL = LOGPHIL(-1)-LOGPHIL(-2) dLOGPHIL = LOGPHIL(-2)-LOGPHIL(-3) dCGPHIL3 = LOGPHIL(-2)-LOGPHIL(-4) dC = C-C(-1) ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL - R-Squared .65133 R-Bar-Squared S.E. of Regression .019705 F-stat. F(16, 37) 3.969 Mean of Dependent Variable0018173 S.D. of Dependent Variable Residual Sum of Squares .013202 Equation Log-likelihood 1 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1 W-Statistic 2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL(4, 4, 4, 4) Selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 Hegressor Coefficient Standard Error T-Ratio OGSNG(-1)047589 .14108 3.3733 OGSNG(-2)034345 .15655 .2193 OGSNG(-4)034345 .15655 .2193 OGSNG(-4)0041739 .068137 .75600 OGSNA(-1)0041739 .068137 .75600 OGSNA(-2) .0041739 .068137 .75600 OGSNA(-2) .0041739 .068137 .75600 OGSNA(-3) .011526 .099506 .1158 NGINA(-3) .011526 .099506 .1158 NGINA(-4) .065371 .072518 .1565 .1555 .11558 .0551 .1555 .1555 .1555 .21931 OGSNA(-4) .0041739 .068137 .75600 .21932 .15553 .21933 .21932 .21932 .21553 .21933 .21932 .21556 .21932 .21932 .21556 .21933 .21932 .21932 .21556 .2193	.1465*C ******** .45649 7[.000] .026729 47.9190)8.0292
ULDGMLY = LOGMLY-LOGMLY(-1) ULDGMLY1 = LOGMLY(-2)-LOGMLY(-2) ULOGMLY3 = LOGMLY(-2)-LOGMLY(-3) ULOGMLY3 = LOGMPLI_COGPHIL(-1) ULOGPHIL = LOGPHIL(-2)-LOGPHIL(-2) ULOGPHIL = LOGPHIL(-2)-LOGPHIL(-2) ULOGPHIL = LOGPHIL(-2)-LOGPHIL(-3) UCOPHIL = LOGPHIL(-2)-LOGPHIL(-4) ecr = C-C(-1) err = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL -5.1465* Resquared .65133 R-Bar-Squared Mean of Dependent variable0018175 S.D. of Dependent variable .02672 Residual Sum of Squares .013202 Equation Log-likelihood 147.919 Dw-statistic .1717 Schwarz Bayesian Criterion 108.029 Dw-statistic .1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Pependent variable is LOGSNG .4400000000000000000000000000000000000	dLOGMLY = LOGMLY(-1) -LOGMLY(-1)dLOGMLY1 = LOGMLY(-1)-LOGMLY(-3)dLOGMLY2 = LOGMLY(-3)-LOGMLY(-4)dLOGPHIL = LOGPHIL(-1)-COGPHIL(-1)dLOGPHIL = LOGPHIL(-1)-LOGPHIL(-2)dLOGPHIL3 = LOGPHIL(-3)-LOGPHIL(-3)dLOGPHIL3 = LOGPHIL(-3)-LOGPHIL(-4)dc = c-c(-1)erm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL4mean of Dependent variable0018173 S.D. of Dependent variableResidual Sum of Squares .013705 F-stat. F(16, 37) 3.965Residual Sum of Squares .013202 Equation Log-likelihood 1Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1DW-statistic .2.1717R-Squared and R-Bar-Squared measures refer to the dependent variabledLOGSNG and in cases where the error correction model is highlyrestricted, these measures could become negative.Autoregressive Distributed Lag EstimatesARDL(4,4,4,4) SelectedDependent variable is LOGSNGS4 observations used for estimation from 199101 to 200402'egressorCoefficient Standard Error T-RatioOGSNG(-1) .0.47589 .13016 .31315OGSNG(-4) .0.04759 .13016 .31315OGSNG(-4) .0.04759 .13016 .31315OGSNG(-4) .0.04759 .13016 .31315OGSNG(-4) .0.04759 .0.3187 .0.68137 .0.68137 .0.68137OGSNA(-4) .0.06834 .0081563 .0.84149VGINA(-3) .011526 .099506 .11548VGINA(-4) .066371 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0.720516 .0	.1465*C ******** .45649 7[.000] .026729 47.9190)8.0292
dLOGMLY1 = LOGMLY(-1)-LOGMLY(-2) dLOGMLY2 = LOGMLY(-3)-LOGMLY(-3) dLOGPHIL = LOGPHIL(-1)-LOGPHIL(-1) dLOGPHIL2 = LOGPHIL(-1)-LOGPHIL(-3) dLOGPHIL3 = LOGPHIL(-3)-LOGPHIL(-3) dLOGPHIL3 = LOGPHIL(-3)-LOGPHIL(-3) dLOGPHIL3 = LOGPHIL(-3)-LOGPHIL(-4) dC = C-C(-1) ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL -5.1465* R-Squared .65133 R-Bar-Squared	dLOGMLY1 = LOGMLY(-1)-LOGMLY(-2) dLOGMLY2 = LOGMLY(-2)-LOGMLY(-3) dLOGPHIL = LOGPHIL-LOGPHIL(-1) dLOGPHIL1 = LOGPHIL(-2)-LOGPHIL(-2) dLOGPHIL2 = LOGPHIL(-2)-LOGPHIL(-3) dC = c-(C-1) ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL R-Squared .65133 R-Bar-Squared S.E. of Regression .019705 F-stat. F(16, 37) 3.965 Mean of Dependent Variable0018173 S.D. of Dependent variable Residual Sum of Squares .013202 Equation Log-likelihood 1 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1 DW-statistic 2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 Meason (-1) .47589 .14108 3.3733 OGSNG(-1) .47589 .14108 3.3733 OGSNG(-1) .034345 .15483 1.3046 OGSNG(-1) .040759 .13016 .31315 OGSNG(-4) .040759 .081187 .050174 OGSNG(-4) .040759 .13016 .31315 OGSNG(-4) .040759 .081187 .050174 OGSNG(-4) .040759 .13016 .31315 OGSNG(-4) .040759 .13016 .31315 OGSNG(-4) .040759 .081167 .08156384149 VGINA(-4) .068371 .0705169950684149 VGINA(-4) .068371 .0705169950684149 VGINA(-4) .068371 .0705169951684149 VGINA(-4) .0615129950684149 VGINA(-4) .0615269950684149 VGINA(-4) .0615269950684149 VGINA(-4) .0615269950684149 VGINA(-4) .061527975189051684149 VGINA(-4) .061527975189051684149 VGINA(-4) .0615269950684149 VGINA(-4) .0615269950684149 VGINA(-4) .0615269950684149 VGINA(-4) .061526995061554 VGINA(-4) .001526995061554 VGINA(-4) .001526995061554 VGINA(-4) .001526995061554 VGINA(-4) .001526	.1465*C ******* .45649 7[.000] .026729 47.9190)8.0292
dLOGMLY2 = LOGMLY(-2)-LOGMLY(-3) dLOGMTX3 = LOGMLIC-(-1) dLOGPHIL = LOGPHIL - LOGPHIL(-2) dLOGPHIL = LOGPHIL(-2)-LOGPHIL(-2) dLOGPHIL = LOGPHIL(-2)-LOGPHIL(-2) dLOGPHIL = LOGPHIL(-2)-LOGPHIL(-4) dc = c-c(-1) ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL - 5.1465* R-Squared .65133 R-Bar-Squared .4564 mean of Dependent variable0018173 S.D. of Dependent Variable .02672 Residual Sum of Squares .013202 Equation Log-likelihood .47.919 Akaike Info. Criterion .127.9190 Schwarz Bayesian Criterion .108.029 Pw-statistic .2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates .ARDL (4.4,4,4) selected Dependent variable is LOGSNG .3.15483 .1.3049 .001 S4 observations used for estimation from 199101 to 200402 'egressor Coefficient Standard Error T-Ratio[Prob] .3731.0021 SGNG(-1) .47589 .13016 .31315 .7560 OGSNG(-2) .0.04345 .15655 .21397.8281 OGSNG(-3) .0.034345 .15655 .21397.8281 OGSNG(-4) .0.04739 .08187 .050144.94061 SGINA .0151518 .0668137 .050144.94061 SGINA .01526 .099506 .1.844.94.961 SGINA .01	dLOGMLY2 = LOGMLY(-2)-LOGMLY(-3) dLOGMLY3 = LOGMLY(-3)-LOGMLY(-4) dLOGPHIL = LOGPHIL-LOGPHIL(-1) dLOGPHIL3 = LOGPHIL(-1)-LOGPHIL(-2) dLOGPHIL3 = LOGPHIL(-3)-LOGPHIL(-4) dc = c-c(-1) ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL - 4 R-Squared .65133 R-Bar-Squared S.E. of Regression .019705 F-stat. F(16, 37) 3.965 Mean of Dependent Variable0018173 S.D. of Dependent Variable Residual Sum of Squares .013202 Equation Log-likelihood 1 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1 DW-statistic 2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 Hegressor Coefficient Standard Error T-Ratio OGSNG(-1) .47589 .14108 3.13045 OGSNG(-3) -034345 .1565521935 OGSNG(-4) .040759 .13016 .31315 OGSNG(-4) .040759 .13016 .31315 OGSNA(-1) -0041739 .083187050174 OGSNA(-2) .006834 .083167 .050174 OGSNA(-2) .011526 .099506 .11544 VEINTACHARCE	.1465*C ******* .45649 7[.000] .026729 47.9190)8.0292
dLOGMLY3 = LOGMLY(-3)-LOGMLY(-4) dLOGPHIL = LOGPHIL(-1)-LOGPHIL(-2) dLOGPHIL2 = LOGPHIL(-3)-LOGPHIL(-3) dLOGPHIL2 = LOGPHIL(-3)-LOGPHIL(-4) dC = C-C(-1) ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL -5.1465* R-Squared .65133 R-Bar-Squared .4564 S.E. of Regression .019705 F-stat. F(16, 37) 3.9697[.000 Mean of Dependent variable0018173 S.D. of Dependent Variable .02672 Residual Sum of Squares .013202 Equation Log-likelihood 147.919 Dw-statistic .2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable .02672 Residual Sum of Squares .013202 Equation Log-likelihood 147.919 Dw-statistic .2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable .02672 Residual Sum of Squares .013202 Equation Log-likelihood 147.919 Dw-statistic .2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable .02672 Residual Sum of Squares .0120 become negative. R-Squared and R-Bar-Squared measures refer to the dependent variable .02672 Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) Selected Dependent variable is LOGSNG S4 observations used for estimation from 1991Q1 to 200402 Hegressor Coefficient Standard Error T-Ratio[Prob] OGSNG(-3) -034345 .13655 -2193[.826] GGINA .040759 .13016 .331315 .7565 GGINA .040759 .13016 .31315 .7569[.351.449].4061 GGINA(-1)0041739 .083187050174[.960] GGINA(-1) -0043587 .04649432249[.931] GGINA(-1) .003587 .04649432249[.931] GGINA(-2) .071673 .041195 .079518 .168431849[.405] GGINA(-4) .065371 .079518 .136538449[.406] GGINA(-4) .005371 .079518 .136538449[.406] GGINA(-4) .005371 .079518 .136161844[.936] GGINA(-4) .005371 .079518 .136161844[.936] GGINA(-4) .005377 .04649422218[.749] GMLY(-1) .003587 .04649422218[.749] GMLY(-1) .003587 .04649422218[.749] GMLY(-1) .003587 .04649422218[.749] GMLY(-1) .003587 .04649422218[.749] GMLY(-1) .003587 .04649422218[.749] GMLY(-1) .028131 .1749016084[.873] GMLY(-1) .028131 .1749016084[.873] GMLY	dLOGMLY3 = LOGMLY(-3)-LOGMLY(-4) dLOGPHIL = LOGPHIL(-1)-COGPHIL(-2) dLOGPHIL1 = LOGPHIL(-2)-LOGPHIL(-2) dLOGPHIL2 = LOGPHIL(-3)-LOGPHIL(-4) dC = C-C(-1) ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL R-Squared .65133 R-Bar-Squared S.E. of Regression .019705 F-stat. F(16, 37) 3.965 Mean of Dependent Variable0018173 S.D. of Dependent Variable Residual Sum of Squares .013202 Equation Log-likelihood 1 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1 DW-statistic 2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 ************************************	.1465*C ******* .45649 7[.000] .026729 47.9190)8.0292
dLoGPHIL = LOGPHIL - LOGPHIL (-2) dLoGPHIL = LOGPHIL (-2)-LOGPHIL (-2) dLOGPHIL = LOGPHIL (-2)-LOGPHIL (-3) dLOGPHIL = LOGPHIL (-2)-LOGPHIL (-4) ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL -5.1465* s.E. of Regression17616*LOGINA032910*LOGMLY + .32652*LOGPHIL -5.1465* wean of Dependent variable0018173 S.D. of Dependent variable .02672 gesidual Sum of Squares013202 Equation Log-1%kelihood 147.919 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 108.029 JW-statistic	dLOGPHIL = LOGPHIL(-LOGPHIL(-1) - LOGPHIL(-2) dLOGPHIL1 = LOGPHIL(-1)-LOGPHIL(-3) dLOGPHIL2 = LOGPHIL(-3)-LOGPHIL(-4) dc = c-c(-1) ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL1 R-Squared .65133 S.E. of Regression .019705 Perstand .65133 Residual Sum of Squares .01202 Equation Log-likelihood 1 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1 Dw-statistic 2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Matoregressive Distributed Lag Estimates ARDL(4, 4, 4, 4) selected Dependent variable is LOGSNG S4 observations used for estimation from 199101 to 200402 Vegressor Coefficient Standard Error OGSNG(-1) .47589 .14108 3.3733 OGSNG(-3) 034345 .15655 213305 OGSNG(-4) .040759 .13016 .13135 OGSNG(-4) .040759	.1465*C ******* .45649 7[.000] .026729 47.9190 08.0292
dLoGPHIL1 = LOGPHIL(-1)-LOGPHIL(-2) dLoGPHIL2 = LOGPHIL(-3)-LOGPHIL(-3) dLoCPHIL3 = LOGPHIL(-3)-LOGPHIL(-4) dC = C-C(-1) ecm = LOGSNG 17616*LOGINA032910*LOGMLY + .32652*LOGPHIL -5.1465* Response .019705 F-stat F(16,3) Mean of Dependent variable0018173 S.D. of Dependent variable02672 Residual Sum of Squares .013202 Equation Log-likelihood 147.919 Akaike Info. Criterion 127.910 Schwarz Bayesian Criterion 108.029 W-statistic 2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable 108.029 vestricted, these measures could become negative. 1 Mutoregressive Distributed Lag Estimates ARDL(4, 4, 4, 4) Selected Dependent variable is LOGSNG 14108 ScosNG(-1) -034345 15655 OGSNG(-2) -034345 15655 OGSNG(-3) -034345 15655 OGINA -0061739 081867 -05604 OGSNA(-1) -0065371 079518 62209(4177) OGSNA(-1) -0065371 079518 62209(dLOGPHIL1 = LOGPHIL(-1)-LOGPHIL(-2) dLOGPHIL2 = LOGPHIL(-2)-LOGPHIL(-3) dLOGPHIL3 = LOGPHIL(-2)-LOGPHIL(-4) dC = C-C(-1) ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL -1 R-Squared .65133 R-Bar-Squared S.E. of Regression .019705 F-stat. F(16, 37) 3.965 Mean of Dependent Variable0018173 S.D. of Dependent Variable Residual Sum of Squares .013202 Equation Log-likelihood 1 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1 DW-statistic 2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL(4, 4, 4, 4) Selected Dependent variable is LOGSNG 54 observations used for estimation from 1991Q1 to 2004Q2 Wegressor Coefficient Standard Error OGSNG(-1) .47889 .14108 3.3733 OGSNG(-3) -034345 .15655 -21936 OGSNG(-4) .040759 .13016 .31315 OGINA .051518 .068137 .75609	.1465*C ******* .45649 7[.000] .026729 47.9190 08.0292
dLOGPHIL = LOGPHIL (-2)-LOGPHIL (-3) dLOGPHIL = LOGSNG 17616*LOGNIA032910*LOGMLY + .32652*LOGPHIL -5.1465* ecm = LOGSNG 17616*LOGNIA032910*LOGMLY + .32652*LOGPHIL -5.1465* ecm = LOGSNG 17616*LOGNIA032910*LOGMLY + .32652*LOGPHIL -5.1465* R-Squared .65133 R-Squared .65133 R-Squared .65133 Residual Sum of Dependent Variable0018173 S.D. of Dependent Variable02672 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 108.029 PW-statistic 2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL (4, 4, 4, 4) Selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 'egressor Coefficient Standard Error OGSNG(-1) -47589 -14108 -37316 OGSNG(-2) .20203 -15483 1.3046 -21391 OGSNG(-3) -034345 -15655 -21391 2016<	dLOGPHIL2 = LOGPHIL(-2)-LOGPHIL(-3) dLOGPHIL3 = LOGPHIL(-2)-LOGPHIL(-4) dC = C-C(-1) ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHI1 R-Squared .65133 R-Bar-Squared S.E. of Regression .019705 F-stat. F(16, 37) 3.960 Mean of Dependent variable0018173 S.D. of Dependent variable Residual Sum of Squares .013202 Equation Log-likelihood 1 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1 DW-statistic 2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Mutoregressive Distributed Lag Estimates ARDL(4,4,4,4) Selected Dependent variable is LOGSNG S4 observations used for estimation from 199101 to 200402 '************************************	.1465*C ****** .45649 7[.000] .026729 47.9190 08.0292
dLOGPHIL3 = LOGPHIL(-3)-LOGPHIL(-4) dC = -CC(-1) ecm = LOGSNG 17616*LOGINA032910*LOGHLY + .32652*LOGPHIL -5.1465* R-Squared .65133 R-Bar-Squared .4564 S.E. of Regression .019705 Residual Sum of Squares .013202 Equation Log-likelihood 147.919 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 108.029 W-statistic 2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLoGSNG and in cases where the error correction model is highly restricted, these measures could become negative.	dLOGPHIL3 = LOGPHIL(-3)-LOGPHIL(-4) dC = C-C(-1) ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL4 R-Squared .65133 R-Bar-Squared S.E. of Regression .019705 F-stat. F(16, 37) 3.965 Mean of Dependent variable0018173 S.D. of Dependent variable Residual Sum of Squares .013202 Equation Log-likelihood 1 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1 DW-statistic .2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Mutoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG S4 observations used for estimation from 199101 to 200402 Westerson .043345 .15655 .2033 .15483 .1.3046 OGSNG(-2) .20203 .15483 .1.3046 OGSNG(-3)	.1465*C ******** .45649 7[.000] .026729 47.9190)8.0292
dC = C-C(-1) erm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL -5.1465* R-Squared .65133 R-Bar-Squared .4564 Mean of Dependent variable0018173 S.D. of Dependent variable .02672 Residual Sum of Squares .01320 Equation Log-likelihood 147.919 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 108.029 Ww-statistic .21717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL (4, 4, 4, 4) Selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 Hegressor Coefficient Standard Error T-Ratio[Prob] OGSNG(-1) .47589 .14108 3.3733[.002] OGSNG(-3) .040759 .13016 .31315.7560 OGSNG(-4)	dC = C-C(-1) ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL - R-Squared .65133 R-Bar-Squared S.E. of Regression .019705 F-stat. F(16, 37) 3.965 Mean of Dependent Variable0018173 S.D. of Dependent Variable Residual Sum of Squares .013202 Equation Log-likelihood 1 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1 DW-statistic 2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 1991Ql to 2004Q2 ************************************	.1465*C ******** .45649 7[.000] .026729 47.9190)8.0292
ecm = LOGSNG 17616*LOGINA 032910*LOGMLY + .32652*LOGPHIL -5.1465x R-Squared .65133 R-Bar-Squared .4564 S.E. of Regression .019705 F-stat. F(16,37) 3.9697[.000 Mean of Dependent variable .001272 Equation Log-likelihood 147.919 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 108.029 Dw-statistic 2.1717 Schwarz Bayesian Criterion 108.029 R-Squared and R-Bar-Squared measures refer to the dependent variable restricted, these measures could become negative. Mutoregressive Distributed Lag Estimates ARDL(4, 4, 4, 4) selected Dependent variable is LOGSNG 14108 3.3731.0021 S4 observations used for estimation from 199101 to 200402 14068 3.3731.0021 Vegressor Coefficient Standard Error T-Ratio[Prob] OGSNG(-1) 043435 .15483 .3049[.2011 OGSNG(-2) .02033 .14108 .3315[.756] OGSNG(-4) .047589 .13016 .31315[.756] OGSNG(-2) .02041739 .088187 .75609[.455] OGINA .051518	ecm = LOGSNG17616*LOGINA032910*LOGMLY + .32652*LOGPHIL -R-Squared.65133R-Squared.65133R-Squared.019705F-Stat. F(16, 37)3.969Mean of Dependent variable0018173S.D. of Dependent variableResidual Sum of Squares.013202Equarion Log-likelihood1Akaike Info. Criterion127.9190Schwarz Bayesian Criterion1Dw-statistic2.1717R-Squared and R-Bar-Squared measures refer to the dependent variabledLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative.Mutoregressive Distributed Lag Estimates ARDL(4,4,4,4) selectedDependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402Vertextore.0203Listas.15483OGSNG(-1).034345.15655.21935OGSNG(-3).034345.15655.21935OGSNG(-4).040759.13016.31315OGINA.051518.068137.75609.051518.068137.051526.099506.11526.099506.11526.099506.11544.11544.011526.011526.099506.11544.051518.068137.05154.05154	.1465*C ******** .45649 7[.000] .026729 47.9190)8.0292
R-Squared .65133 R-Bar-Squared .4564 S.E. of Regression .019705 F-Stat. F(16, 37) 3.9697[.000 Mean of Dependent variable .0018173 S.D. of Dependent Variable .02672 Residual Sum of Squares .013202 Equation Log-likelihood 147.919 DW-statistic 2.1717 Schwarz Bayesian Criterion 108.029 R-Squared and R-Bar-Squared measures refer to the dependent variable .02672 Autoregressive Distributed Lag Estimates	R-Squared .65133 R-Bar-Squared S.E. of Regression .019705 F-stat. F(16, 37) 3.969 Residual Sum of Squares .013202 Equation Log-likelihood 1 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1 DW-statistic 2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable 1 dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Mutoregressive Distributed Lag Estimates ARDL(4, 4, 4, 4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 Regressor Coefficient Standard Error T-Ratio OGSNG(-1) .47589 .14108 3.3733 OGSNG(-3) 034345 .15655 21930 OGSNG(-4) .040759 .13016 .31315 OGINA .051518 .068137 .75609 OGINA .051526 .029506 .11584 OGINA(-1) 0041739 .083187 050174 OGINA(-2) .065871 <td< td=""><td>.1465*C ******** .45649 7[.000] .026729 47.9190)8.0292</td></td<>	.1465*C ******** .45649 7[.000] .026729 47.9190)8.0292
R-Squared .65133 R-Bar-Squared .4564 Mean of Dependent variable .0018173 S. D. of Dependent variable .02672 Residual Sum of Squares .013202 Equation Log-likelihood 147.919 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 108.029 DW-statistic 2.1717 Schwarz Bayesian Criterion 108.029 Residual Care where the error correction model is highly restricted, these measures could become negative.	R-Squared .65133 R-Bar-Squared S.E. of Regression .019705 F-stat. F(16, 37) 3.969 Mean of Dependent Variable0018173 S.D. of Dependent Variable Residual Sum of Squares .013202 Equation Log-likelihood 1 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1 DW-statistic 2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 Regressor Coefficient Standard Error T-Ratic OGSNG(-1) .47589 .14108 3.3733 OGSNG(-2) .20203 .15483 1.3046 OGSNG(-2) .040759 .13016 .31315 OGSNG(-4) .040759 .13016 .31315 OGINA .051518 .068137 .756074 SGINA(-2) .068634 .08156384149 SGINA(-4) .065371 .07512 .07512	.45649 7[.000] .026729 47.9190)8.0292
S.E. of Regression 019705 F-stat. F(16, 37) 3.9697[.000 Mean of Dependent Variable .0018173 S.D. of Dependent Variable .02672 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 147.919 DW-statistic 2.1717 Schwarz Bayesian Criterion 108.029 Resquared and R-Bar-Squared measures refer to the dependent variable 108.029 McLocSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) Selected Safagaa Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 14108 kegressor Coefficient Standard Error T-Ratio[Prob] OGSNG(-1) -034345 .15655 -2199[828] OGSNG(-4) -040759 .13016 .31315[.756] OGINA(-1) -0068634 .081867 -0509[451] OGINA(-1) -00687 .0440759 .13016 .31315[.756] OGINA(-2) -068637 .046494 .32218[.749] .2218[.749] OGINA(-1) -0041739 .068187	S.E. of Regression .019705 F-stat. F(16, 37) 3.966 Mean of Dependent Variable0018173 S.D. of Dependent variable Residual Sum of Squares .013202 Equation Log-likelihood 1 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1 Dw-statistic 2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 Herror Coefficient Standard Error T-Ratic OGSNG(-1) .47589 .14108 3.3733 OGSNG(-2) .20203 .15483 1.3046 OGSNG(-3)034345 .15655 .21935 OGSNG(-4) .040759 .13016 .31315 OGSNG(-4) .040759 .13016 .31315 OGSNA(-1)0041739 .083187 .050174 SGINA(-2) .068634 .081563 .84149 SGINA(-4) .065371 .079516 .1584 .081563 .15849 SGINA(-4) .065371 .079516 .1584	.45649 7[.000] .026729 47.9190)8.0292
Mean of Dependent Variable0016173 1.5.0. of Dependent Variable .02672 Residual Sum of Squares .013202 Equation Log-likelihood 147.919 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 108.029 Dw-statistic 2.1717 Schwarz Bayesian Criterion 108.029 ReSQuared and R-Bar-Squared measures refer to the dependent variable dLoGSNG and in cases where the error correction model is highly restricted, these measures could become negative.	Mean of Dependent Variable0018173 S.D. of Dependent Variable Residual Sum of Squares .013202 Equation Log-likelihood 1 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 1 DW-statistic 2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable 1 dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 1991Q1 to 2004Q2 Regressor Coefficient Standard Error T-Ratio OGSNG(-1) .47589 .14108 .05NG(-2) .20203 .15483 OGSNG(-4) .040759 .13016 OGSNG(-1) 034345 .15655 21939 OGINA .051518 .068137 .75609 OGINA(-1) 0041739 .083187 .05074 OGINA(-2) .068634 .081563 .84149 SGINA(-4) .051526 .099506 .11584	7[.000] .026729 47.9190 08.0292
Residual Sim of Squares 101202 Equation Log-likelihood 147.919 Akaike Info. Criterion 127.9190 Schwarz Bayesian Criterion 108.029 Mustatistic 2.1717 2.1717 2.1717 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. 108.029 Autoregressive Distributed Lag Estimates ARDL(4, 4, 4, 4) Selected 2.1717 Dependent variable is LOGSNG 4.4108 3.3731.0021 S4 observations used for estimation from 199101 to 200402 1.4108 3.37331.0021 OGSNG(-1) .47589 .16653 219991.8281 OGSNG(-2) .20203 .15483 1.30491.2011 OGSNG(-1) .034345 .15655 219991.8281 OGSNG(-1) .034345 .15653 219991.8281 OGINA .051518 .068137 .756091.4551 OGINA .051518 .068137 .756091.4551 OGINA(-1) 0041739 .083187 .050174(.9960] OGINA(-2) .071673 .046494 .32209[.417] XGMLY(-1) .0036587 <	Residual Sum of Squares.013202Equation Log-likelihood1Akaike Info. Criterion127.9190Schwarz Bayesian Criterion1Dw-statistic2.1717R-Squared and R-Bar-Squared measures refer to the dependent variabledLOGSNG and in cases where the error correction model is highlyrestricted, these measures could become negative.Mutoregressive Distributed Lag EstimatesARDL(4,4,4,4) selectedDependent variable is LOGSNG54 observations used for estimation from 199101 to 200402***********************************	.026729 47.9190 08.0292
Akaike Info. Criterion 127.3190 Schwarz Bayesian Criterion 108.029 DW-statistic 2.1717 108.029 108.029 R-Squared and R-Bar-Squared measures refer to the dependent variable 108.029 108.029 Autoregressive Distributed Lag Estimates ABDL(4, 4, 4, 4) 108.029 Autoregressive Distributed Lag Estimates ARDL(4, 4, 4, 4) 108.029 Autoregressive Distributed Lag Estimates ARDL(4, 4, 4, 4) 108.029 Cossequence Coefficient Standard Error T-Ratio[Prob] OGSNG(-1) .47589 .14108 3.3733[.002] OGSNG(-2) .20203 .15483 1.3049[.201] OGSNG(-3) 034345 .15655 21939[.828] OGINA .040759 .13016 .31315[.756] OGINA(-1) 0041739 .068137 .75609[.455] OGINA(-2) 068634 .083187 050174[.960] SMLY(-1) .003587 .046494 .078693[.938] SGINA(-2) 066537 .046494 .078633[.938] SGNAL(-1) .010524 .039332 26757[.791] SMLY(-1) <	Akaike Info. Criterion127.9190Schwarz Bayesian Criterion1Dw-statistic2.1717R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative.Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selectedDependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402RegressorCoefficientStandard ErrorT-Ratic 0GSNG(-1).47589.14108.3373OGSNG(-2).20203.154831.3049OGSNG(-4).040759.1016.31315OGINA.051518.068137.7609.06834.081563.05174.011526.099506.11584.011526.099506.1584.01526.099506.1584.01526.099506.1584.01526.099506.1584.01526.099506.1584.01526.099506.1584.01526.099506.1584.1584	47.9190 08.0292
Dw-statistic 21717 21717 108.029 R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 1991Q1 to 2004Q2 T-Ratio[Prob] 4.7589 Vegressor Coefficient Standard Error OGSNG(-1) .47589 .14108 0GSNG(-2) .20203 .15483 0GSNG(-1) .034345 .13016 0GSNG(-1) .04759 .13016 0GSNG(-1) .040759 .13016 0GSNG(-1) .040759 .13016 0GINA .040759 .13016 0GINA(-1) .0041739 .068187 .05091 (455) 0GINA(-1) .004324 .031518 .068137 .75609 (455) 0GINA(-1) .01091 .03424 .2208 (.177) .9601 (.1584 (.908) 0GINA(-3) .011091 .0342	Dw-statistic2.1717R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative.Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selectedDependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 (SegressorVegressorCoefficient .47589Standard Error .0GSNG(-1)T-Ratic .47589OGSNG(-2) .20203.14108 .15655OGSNG(-3) OGSNG(-4).040759 .13016OGSNG(-4) .040759.13016 .1312OGINA .0GINA(-1).0041739 .0041739OGINA(-2) .0011526.099506 .1584OGSNA(-4) .005371.079518OGSNA(-4).065371 .079518	08.0292
R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL(4, 4, 4, 4) selected Dependent variable is LOGSNG 54 observations used for estimation from 1991Q1 to 2004Q2 Wegressor Coefficient Standard Error T-Ratio[Prob] OGSNG(-1) .47589 .47589 .14108 .3733[.002] OGSNG(-2) .20203 .15655 .21939[.828] OGSNG(-4) .040759 .13016 .31315[.756] OGINA .051518 .068137 .75609[.455] .209506 .05174[.960] .031424 .301826 .095506 .011526 .099506 .011526 .099506 .011091 .034424 .32218[.749] XGMLY(-1) .001524 .039322 26757[.791] XGMLY(-2) .071673 .041195 .17399[.091] XGMLY(-4) .065371 .030064 .1.412[.159] XGMLY(-3) .010524 .03302 .26757[.	R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 (egressor Coefficient Standard Error T-Ratio OGSNG(-1) .47589 .14108 3.3733 OGSNG(-2) .20203 .15483 1.3049 OGSNG(-2) .20203 .15483 1.3049 OGSNG(-3)034345 .1565521935 OGSNG(-4) .040759 .13016 .31315 OGSNG(-4) .040759 .13016 .31315 OGINA .051518 .068137 .75609 OGINA .051518 .068137 .050174 OGSNA(-2)068634 .08156384149 OGINA(-3) .011526 .099506 .11584	*****
R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 1991Q1 to 2004Q2 Weressor Coefficient Standard Error T-Ratio[Prob] OGSNG(-1) .47589 .47589 .14108 .37331 (002) OGSNG(-2) .20203 .15655 .21939[.8283] OGSNG(-3) -0.34345 .15655 -21939[.8283] OGINA .051518 .068137 .75609[.4455] STINA(-2) .0068634 .083187 -050174[.960] XGINA(-3) .01526 .09306 .11584[.908] XGMLY(-1) .0036587 .046494 .083187 .2218[.749] XGMLY(-1) .0035644 .13332 .2218[.749] .041495 .1.7396[.991] XGMLY(-4) .003543 .22310 .26757[.791] XGMLY(-4) .028311	R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL (4, 4, 4, 4) selected Dependent variable is LOGSNG 54 observations used for estimation from 1991Q1 to 2004Q2 kegressor OGSNG(-1) OGSNG(-2) Coefficient Standard Error OGSNG(-2) Coefficient Standard Error OGSNG(-2) Coefficient OGSNG(-3) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4) OGSNG(-4)	******
dLoGSNG and in cases where the error correction model is highly restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL (4, 4, 4, 4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 Wegressor Coefficient Standard Error T-Ratio[Prob] OGSNG(-1) .47589 .14108 3.3733[.002] OGSNG(-2) .20203 .15483 1.3049[.201] OGSNG(-3) 034345 .15655 21939[.828] OGINA .040759 .13016 .31315[.756] OGINA .040759 .13016 .31315[.756] OGINA(-1) 0041739 .068137 .050174[.960] SGINA(-2) .006854 .083187 050174[.960] SGINA(-2) .006371 .079518 .82209[.417] SGINA(-2) .0036587 .046494 .078633[.938] SGMLY(-1) .0036547 .046494 .078633[.938] SGMLY(-2) .071673 .041195 .7399[.091] SMLY(-2) .071673 .041195	dLoGSNG and in cases where the error correction model is highlyAutoregressive Distributed Lag Estimates ARDL (4, 4, 4, 4) selectedDependent variable is LOGSNG54 observations used for estimation from 199101 to 200402tegressorCoefficientStandard ErrorT-RatioOGSNG(-1).47589.141083.3733OGSNG(-2).20203.154831.3046OGSNG(-3)034345.1565521939OGINA.051518.068137.75609.051NA(-1)0041739.06834.081563.051NA(-2).068634.051518.081563.051NA(-2).065371.079518.099506.11526.099506.11584.011526.099506.11584	
restricted, these measures could become negative. Autoregressive Distributed Lag Estimates ARDL (4, 4, 4, 4) selected Dependent variable is LOGSNG S4 observations used for estimation from 199101 to 200402 Vegressor Coefficient Standard Error T-Ratio[Prob] OGSNG(-1) 47589 OdSNG(-2) 0GSNG(-2) 0GSNG(-3) OGSNG(-4) OdOTNA OGSNG(-4) OdOTNA OGSNG(-4) OdOTNA OGSNG(-4) OdOTNA OGSNG(-4) OdOTNA OGSNG(-4) OdOTNA OGSNG(-4) OGSNG(-4) OdOTNA OGSNG(-4) OGSNG(-4) OdSNG(-4) OdSNG(-4) OdSNG(-4)	restricted, these measures could become negative.Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selectedDependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402VegressorCoefficientStandard ErrorT-Ration 0GSNG(-1).47589.14108.06SNG(-2).20203.154831.3040.06SNG(-3)034345.1565521930.06SNG(-4).040759.13016.31315.051518.068137.75609.068137.05174.068634.06816384149.061NA(-3).011526.099506.11584.061NA(-4).065371.07512.099506.1526.099506.1527.02020.1528.09506.1526.09506.1526.09506.1527.07512	
Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 Vegressor Coefficient SGSNG(-1) .47589 .4108 3.3733[.002] OGSNG(-2) .20203 .14108 3.3733[.002] OGSNG(-2) .20203 .15483 1.3049[.201] OGSNG(-4) .034345 .15655 .21939[.828] OGINA .051518 .0GSNG(-4) .0040759 .0GSNG(-4) .0041739 .0GSNG(-4) .0041739 .0GSNG(-4) .0041739 .0GSNG(-4) .0051518 .0GSNG(-1) 0041739 .0SINA(-2) .0068634 .0SINA(-2) .0036587 .0GSNG2 .050174[.960] .0GSNG2 .071673 .0GSNG2 .227957[.991] .0GNLY(-4) .0036587 .0GSNG4 .15844 .0GSNG4 .1412[.159] .0GNLY(-4) .043329 .0GSNG4 .1412[.159]	Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 ************************************	
Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 1991Q1 to 2004Q2 Regressor Coefficient Standard Error OGSNG(-1) .47589 .14108 3.3733[.002] OGSNG(-2) .20203 .15483 1.3049[.201] OGSNG(-4) .040759 .13016 .31315[.756] OGINA .040759 .13016 .31315[.756] OGINA(-1) 0041739 .088187 .75609[.455] OGINA(-2) .0058634 .081563 84149[.406] SGINA(-2) .0068634 .081563 84149[.406] OGINA(-3) .011526 .099506 .11584[.908] XGMLY .011091 .034424 .32218[.749] XGMLY(-1) .0036587 .046494 .078693[.938] XGMLY(-2) .071673 .04195 .1739[.091] XGMLY(-4) .010524 .039332 .26757[.791] XGMLY(-4) .02621 .27284 .2310 .80246[.428] XGPHIL(-1) .17903	Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selectedDependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402VegressorCoefficientStandard ErrorT-Ratic OGSNG(-1).47589.14108.905NG(-2).20203.154831.3049OGSNG(-3)034345.1565521939OGSNG(-4).040759.13016.31315.0GINA.051518.0G8137.75609.0GINA(-1)068634.011526.099506.011526.099506.11584.07511	
Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 Regressor Coefficient Standard Error T-Ratio[Prob] 0GSNG(-1) 0GSNG(-2) .20203 .14108 3.3733[.002] 0GSNG(-2) .20203 .14108 3.3733[.002] 0GSNG(-4) .040759 .13016 .13135[.756] 0GINA .051518 .068137 .75609[.425] 0GINA(-1) 0041739 .083187 0507[.456] 0GINA(-2) 06634 .081563 84149[.406] NGINA(-1) 011091 .034424 32218[.749] NGMLY 011091 .034424 32218[.749] XGMLY(-1) .003587 .044195 1.7399[.091] XGMLY(-4) .001524 .039332 26757[.791] XGMLY(-4) .028131 .17490 .16084[.873] XGMLY(-4) .028131 .17490 .16084[.873] XGMLY(-4) .26251 .78057 .04126	Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selectedDependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402VegressorCoefficientOGSNG(-1).47589.141083.3733OGSNG(-2).20203.154831.3049OGSNG(-3)034345.1565521939OGSNG(-4).040759.13016.31315OGINA.051518.068137.75609.051NA(-1)068634.051NA(-3).011526.099506.11584	
Autoregressive Distributed Lag Estimates ARDL (4, 4, 4, 4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 regressor Coefficient Standard Error T-Ratio[Prob] OGSNG(-1) .47589 .14108 3.3733[.002] OGSNG(-2) .20203 .14108 3.3733[.002] OGSNG(-3) 034345 .15655 21939[.828] OGSNG(-4) .040759 .13016 .31315[.756] OGINA .051518 .068137 .75609[.455] OGINA .051518 .081563 84149[.406] JGINA(-1) 0041739 .083187 050174[.960] JGINA(-2) 068634 .081563 84149[.406] JGINA(-4) .065371 .079518 .82209[.417] JGMLY(-1) .0036587 .044195 1.7399[.091] JGMLY(-2) .071673 .041195 1.7399[.091] JGMLY(-4) 028131 .17490 .16084[.873] JGMLY(-4) .028131 .17490 .16084[.873] JGMLY(-4) <td>Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 '************************************</td> <td></td>	Autoregressive Distributed Lag Estimates ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 '************************************	
ARDL(4,4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 2004Q2 regressor Coefficient Standard Error T-Ratio[Prob] OGSNG(-1) .47589 .14108 3.3733[.002] OGSNG(-2) .20203 .15483 1.3049[.201] OGSNG(-2) .20203 .15483 1.3049[.201] OGSNG(-4) .040759 .13016 .331315[.756] OGINA .051518 .068137 .75609[.455] OGINA(-1) 0041739 .083187 050174[.960] SGINA(-2) 068634 .081563 84149[.406] SGINA(-2) 0686371 .079518 .82209[.417] SGMLY(-1) .0036587 .046494 .078693[.938] SGMLY(-1) .0036587 .046494 .078693[.938] SGMLY(-2) .071673 .041195 1.7399[.091] SGMLY(-4) 028131 .17490 .16084[.873] SGMLY(-4) .028131 .17490 .60846[.428] SGPHIL (-1) 17903 .22310 .80246[.428] SGPHIL (-3)	ARDL (4, 4, 4, 4) selected Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 ************************************	
Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 regressor Coefficient Standard Error T-Ratio[Prob] OGSNG(-1) .47589 .4108 3.373[.002] OGSNG(-2) .20203 .14108 1.3049[.201] OGSNG(-3) 034345 .15685 21939[.828] OGINA .040759 .13016 .31315[.756] OGINA(-1) 0041739 .068137 .75609[.455] DGINA(-2) 068634 .081863 .051518 .068137 .75609[.455] DGINA(-2) 068634 .081563 .05171 .079518 .82209[.417] XGMLY 011091 .034424 .32218[.749] XGMLY(-2) .071673 .046494 .078693[.938] XGMLY(-3) 010524 .039332 26757[.791] XGMLY(-4) .028131 .17490 .16084[.873] XGMLY(-4) .028131 .17490 .16084[.873] XGMLY(-2) .087453 .21718 .40266[.4	Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 ************************************	
Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 'egressor Coefficient OGSNG(-1) .47589 OGSNG(-2) .20203 OGSNG(-3) 034345 OGSNG(-4) .040759 OGINA(-1) 0041739 OGINA(-1) 0041739 OGINA(-2) 068634 OGINA(-2) 068634 OGINA(-3) .011526 OGINA(-4) .0605371 OGSNG(-4) .001526 OGINA(-4) .006871 OGINA(-2) 010091 OJIS26 .099506 JGINA(-4) .0036587 OGMLY 01091 JGMLY(-1) .0036587 OGINA(-2) .071673 OGINA(-4) .003332 JGMLY(-4) .003424 JGMLY(-3) .010524 JGMLY(-4) .0028131 JGMLY(-4) .0287131 JGMLY(-4) .0287131 JGMLY(-4) .0287453 JGMLY(-4	Dependent variable is LOGSNG 54 observations used for estimation from 199101 to 200402 '************************************	
54 observations used for estimation from 199101 to 2004Q2 Regressor Coefficient Standard Error T-Ratio[Prob] OGSNG(-1) .47589 .14108 3.3733[.002] OGSNG(-2) .20203 .15483 1.3049[.201] OGSNG(-4) .040759 .15655 21939[.828] OGINA .040759 .13016 .31315[.756] OGINA(-1) 0041739 .083187 050174[.960] SGINA(-2) 068634 .081563 84149[.406] SGINA(-2) 068634 .081563 84149[.406] SGINA(-2) 0686371 .079518 .82209[.417] SGMLY 011091 .034424 32218[.749] SGMLY(-1) .0036587 .046494 .078693[.938] SGMLY(-3) 010524 .039332 26757[.791] SGMLY(-3) 010524 .039332 26757[.791] SGPHIL 028131 .17490 16084[.873] SGPHIL(-1) 17903 .22310 80246[.428] SGPHIL(-2) .087453 .21718 .40268[.690] SGPHIL(-4)	54 observations used for estimation from 199101 to 200402 '************************************	******
Regressor Coefficient Standard Error T-Ratio[Prob] OGSNG(-1) .47589 .14108 3.3733[.002] OGSNG(-3) .20203 .15483 1.3049[.201] OGSNG(-4) .040759 .13016 .31315[.756] OGINA .051518 .068137 .75609[.455] OGINA(-1) 0041739 .083187 050174[.960] JGINA(-2) 068634 .081563 84149[.406] JGINA(-3) .011526 .099506 .11584[.908] JGMLY 01091 .034424 32218[.749] JGMLY(-1) .0036587 .046494 .078693[.938] JGMLY(-2) .071673 .041195 1.7399[.091] JGMLY(-4) 028131 .17490 .16084[.873] JGPHIL 028131 .17490 .16084[.873] JGPHIL(-1) 17903 .22310 .80246[.428] JGPHIL(-4) .25621 .14521 -1.7645[.087] JGPHIL(-4) .25621 .14521 -1.7645[.087] JG	W####################################	
legressor Coefficient Standard Error T-Ratio[Prob] OGSNG(-1) .47589 .14108 3.3733[.002] OGSNG(-3) .034345 .15483 1.3049[.201] OGSNG(-4) .040759 .13016 .31315[.756] OGINA .051518 .068137 .75609[.455] OGINA(-1) 0041739 .083187 050174[.960] OGINA(-2) .068634 .081563 84149[.406] JGINA(-3) .011526 .099506 .11584[.908] JGMLY .01191 .034424 32218[.749] JGMLY(-1) .0036587 .046494 .078693[.938] JGMLY(-2) .071673 .041195 1.7399[.091] JGMLY(-4) 028131 .17490 16084[.873] JGPHIL .028743 .22310 80246[.428] JGPHIL(-1) .17903 .22310 80246[.428] JGPHIL(-3) .27284 .20371 1.3394[.189] JGPHIL(-4) .25621 .14521 1.7645[.087] .264	Regressor Coefficient Standard Error T-Ratic OGSNG(-1) .47589 .14108 3.3733 OGSNG(-2) .20203 .15483 1.3049 OGSNG(-3) 034345 .15655 21939 OGSNG(-4) .040759 .13016 .31315 OGINA .051518 .068137 .75609 OGINA(-1) 0041739 .083187 050174 OGINA(-2) 068634 .081563 84149 JGINA(-3) .011526 .099506 .11584	
OGSNG(-1) .47589 Jtantal trian 1-Ratio(Prob) OGSNG(-2) .20203 .15483 3.3733[.002] OGSNG(-3) 034345 .15655 21939[.828] OGSNG(-4) .040759 .13016 .31315[.756] OGINA .051518 .068137 .75609[.455] OGINA(-1) 0041739 .083187 050174[.960] SGINA(-2) 068634 .081563 84149[.406] SGINA(-2) 0686371 .079518 .82209[.417] SGMLY(-1) .0036587 .046494 .078693[.938] SGMLY(-1) .0036587 .046494 .078693[.938] SGMLY(-3) .010524 .039332 26757[.791] SGHLY(-4) 043329 .030064 -1.4412[.159] SGHLY(-4) .028131 .17490 .16084[.873] SGHLY(-3) .27284 .20371 1.3394[.189] SGPHIL(-2) .087453 .21718 .40268[.690] SGPHIL(-4) .25621 .14521 -1.7645[.087] SGPHIL(-4) .25621 .14521 .179466 Squ	OGSNG(-1) .47589 .14108 3.3733 OGSNG(-2) .20203 .15483 1.3049 OGSNG(-3) 034345 .15655 21939 OGSNG(-4) .040759 .13016 .31315 OGINA .051518 .068137 .75609 OGINA(-1) 0041739 .083187 050174 OGINA(-2) 068634 .081563 84149 JGINA(-3) .011526 .099506 .11584	******
OGSNG(-2) .20203 .154100 3.3/33].002] OGSNG(-3) 034345 .15655 21939[.828] OGSNG(-4) .040759 .13016 .31315[.756] OGINA .051518 .068137 .75609[.455] OGINA(-1) 0041739 .083187 050174[.960] OGINA(-2) 068634 .081563 84149[.406] SGINA(-2) 068634 .081563 84149[.406] SGINA(-4) .065371 .079518 .82209[.417] SGMLY 011091 .04424 .32218[.749] SGMLY(-1) .0036587 .046494 .078693[.938] SGMLY(-2) .071673 .041195 1.7399[.091] SGMLY(-3) 010524 .039332 26757[.791] SGHIL(-1) 028131 .17490 16084[.873] SGPHIL(-1) .0287453 .21718 .40268[.690] SGPHIL(-2) .087453 .21718 .40268[.690] SGPHIL(-3) .27284 .20371 1.3394[.189] SGPHIL(-4) 25621 .14521 .1.7645[.087] .624	OGSNG(-2) .20203 .15400 3.3733 OGSNG(-3) 034345 .15483 1.3049 OGSNG(-4) .040759 .15655 21939 OGINA .051518 .068137 .75609 OGINA(-1) 0041739 .083187 050174 OGINA(-2) 068634 .081563 84149 OGINA(-3) .011526 .099506 .11584	[Prob]
OGSNG(-3) 034345 .15453 1.3049[.201] OGSNG(-4) .040759 .13016 .31315[.756] OGINA .051518 .068137 .75609[.455] OGINA(-1) 0041739 .083187 050174[.960] SGINA(-2) 068634 .081563 84149[.406] SGINA(-3) .011526 .099506 .11584[.908] SGMLY(-4) .065371 .079518 .82209[.417] SGMLY(-1) .0036587 .046494 .078693[.938] SGMLY(-2) .071673 .041195 1.7399[.091] SGMLY(-3) 010524 .039332 26757[.791] SGMLY(-4) 028131 .17490 .16084[.873] SGPHIL(-1) 17903 .22310 80246[.428] SGPHIL(-2) .087453 .21718 .40268[.690] SGPHIL(-3) .27284 .20371 1.3394[.189] SGPHIL(-4) 25621 .14521 -1.7645[.087] SGPHIL(-4) 25621 .14521 -1.7645[.087] SGMLY 019705 F-stat. F(19, 34) 11.7951[.000] <td>OGSNG(-3) 034345 .15655 21939 OGSNG(-4) .040759 .13016 .31315 OGINA .051518 .068137 .75609 OGINA(-1) 0041739 .083187 050174 OGINA(-2) 068634 .081563 84149 OGINA(-3) .011526 .099506 .11584</td> <td>[.002]</td>	OGSNG(-3) 034345 .15655 21939 OGSNG(-4) .040759 .13016 .31315 OGINA .051518 .068137 .75609 OGINA(-1) 0041739 .083187 050174 OGINA(-2) 068634 .081563 84149 OGINA(-3) .011526 .099506 .11584	[.002]
OGSNG(-4) .040759 .13013 21939[.828] OGINA .051518 .068137 .75609[.455] OGINA(-1) 0041739 .083187 050174[.960] OGINA(-2) 068634 .081563 84149[.406] OGINA(-3) .011526 .099506 .11584[.908] NGINA(-4) .065371 .079518 .82209[.417] NGMLY 011091 .034424 32218[.749] NGMLY(-1) .0036587 .046494 .078693[.938] NGMLY(-2) .071673 .041195 1.739[.091] NGMLY(-3) 010524 .039332 26757[.791] NGMLY(-4) 028131 .17490 16084[.873] NGPHIL 028131 .17490 16084[.873] NGPHIL(-1) 17903 .22310 80246[.428] NGPHIL(-2) .087453 .21718 .40268[.690] NGPHIL(-4) 25621 .14521 -1.7665[.087] NGMLY(-4) 26754 .20371 1.3394[.189] NGPHIL(-4) 26621 .14521 -1.7665[.087] NGPHI	OGSNG(-4) .040759 .13013 21939 OGINA .051518 .068137 .31315 OGINA(-1) 0041739 .083187 050174 OGINA(-2) 068634 .081563 84149 OGINA(-3) .011526 .099506 .11584	[.201]
OGINA .051518 .16010 .31315[.756] OGINA(-1) 0041739 .083187 .75609[.455] OGINA(-2) 068634 .081563 050174[.960] OGINA(-3) .011526 .099506 .11584[.908] OGINA(-4) .065371 .079518 .82209[.417] OGNLY 011091 .034424 32218[.749] OGNLY 011091 .034424 32218[.749] OGNLY(-1) .0036587 .046494 .078693[.938] OGMLY(-2) .071673 .041195 1.7399[.091] NGMLY(-2) .071673 .041195 1.7399[.091] NGMLY(-4) 043329 .030064 -1.4412[.159] NGPHIL 028131 .17490 16084[.873] NGPHIL(-1) 17903 .22310 80246[.428] NGPHIL(-2) .087453 .21718 .40268[.690] NGPHIL(-3) .27284 .20371 1.3394[.189] 1.6245 .78057 .0812[.045] .0812[.045] 'Squared .86827 R-Bar-Squared .79466 'Squared	OGINA .051518 .068137 .75609 OGINA(-1) 0041739 .083187 050174 OGINA(-2) 068634 .081563 84149 OGINA(-3) .011526 .099506 .11584 OGINA(-4) .065371 .079518 .033272	[.828]
DGINA(-1) 0041739 .083187 ./5609[.455] DGINA(-2) 068634 .083187 050174[.960] DGINA(-3) .011526 .099506 .11584[.908] DGINA(-4) .065371 .079518 .82209[.417] DGMLY 011091 .034424 32218[.749] DGMLY(-1) .0036587 .046494 .078693[.938] DGMLY(-2) .071673 .041195 1.7399[.091] DGMLY(-3) 010524 .039332 26757[.791] DGMLY(-4) 028131 .17490 16084[.873] DGPHIL 028131 .17490 .16084[.873] DGPHIL(-1) 17903 .22310 80246[.428] DGPHIL(-3) .27284 .20371 1.3394[.189] JGPHIL(-4) 25621 .14521 -1.7645[.087] JGPHIL(-4) 25621 .14521 -1.7645[.087] Squared .86827 R-Bar-Squared .79466 E. of Regression .019705 F-stat. F(19, 34) 11.7951[.000]	OGINA(-1) 0041739 .0083187 050174 OGINA(-2) 068634 .083163 050174 OGINA(-3) .011526 .099506 .11584 OGINA(-4) .065371 .079518 .03222	[.756]
DGINA(-2) 068634 .081563 0501/4[.960] DGINA(-3) .011526 .099506 .11584[.908] DGINA(-4) .065371 .079518 .82209[.417] DGMLY 011091 .034424 32218[.749] DGMLY(-1) .0036587 .046494 .078693[.938] DGMLY(-2) .071673 .041195 1.7399[.091] DGMLY(-3) 010524 .030064 -1.4412[.159] DGPHIL 028131 .17490 16084[.873] DGPHIL 028131 .17490 16084[.873] DGPHIL(-1) 17903 .22310 80246[.428] DGPHIL(-2) .087453 .21718 .40268[.690] DGPHIL(-3) .27284 .20371 1.394[.189] DGPHIL(-4) 25621 .14521 -1.7645[.087] Squared .86827 R-Bar-Squared .79466 E. of Regression .019705 F-stat. F(19, 34) 11.7951[.000]	DGINA(-2) 068634 .081563 0501/4 DGINA(-3) .011526 .099506 .11584 DGINA(-4) .065371 .079518 .12322	[.455]
>GINA(-3) .011526 .099506 .11584[.908] >GMLY .011091 .079518 .82209[.417] >GMLY(-1) .0036587 .046494 .32218[.749] >GMLY(-2) .071673 .041195 1.7399[.091] >GMLY(-3) 010524 .039332 26757[.791] >GMLY(-4) 043329 .030064 -1.4412[.159] >GPHIL 028131 .17490 .16084[.873] >GPHIL(-1) 17903 .22310 80246[.428] >GPHIL(-3) .27284 .20371 1.3394[.189] >GPHIL(-4) 25621 .14521 -1.7645[.087] 6245 .78057 2.0812[.045] .9466 Squared .86827 R-Bar-Squared .79466 E. of Regression .019705 F-stat. F(19, 34) 11.7951[.000]	DGINA(-3) .011526 .099506 .11584 DGINA(-4) .065371 .079518 .11584	[.960]
>GINA(-4) .065371 .079518 .82209[.417] >GMLY 011091 .034424 32218[.749] >GMLY(-1) .0036587 .046494 .078693[.938] >GMLY(-2) .071673 .041195 1.7399[.091] >GMLY(-4) 010524 .039332 26757[.791] >GPHIL 028131 .17490 16084[.873] >GPHIL(-1) 17903 .22310 80246[.428] >GPHIL(-2) .087453 .21718 .40268[.690] >GPHIL(-3) .27284 .20371 1.3394[.189] >GPHIL(-4) 25621 .14521 -1.7645[.087] >.6245 .78057 2.0812[.045] .79466 >an of Dependent Variable 4.5541 S.D. of Dependent Variable .79466	GINA(-4) .065371 .079518 .11584	[.406]
JGMLY 011091 .034424 .82209[.417] JGMLY(-1) .0036587 .046494 .32218[.749] JGMLY(-2) .071673 .046494 .078693[.938] JGMLY(-3) 010524 .039332 26757[.791] JGMLY(-4) 043329 .030064 -1.4412[.159] JGPHIL 028131 .17490 16084[.873] JGPHIL(-1) 17903 .22310 80246[.428] JGPHIL(-2) .087453 .21718 .40268[.690] JGPHIL(-3) .27284 .20371 1.3394[.189] JGPHIL(-4) 25621 .14521 -1.7645[.087] JGPHIC(-4) 25621 .14521 -1.7645[.087] JGPHIC(-5) .019705 F-stat. F(19, 34) 11.7951[.000]		.908
JGMLY(-1) .0036587 .046494 .078693[.938] JGMLY(-2) .071673 .041195 1.7399[.091] JGMLY(-3) 010524 .039332 26757[.791] JGMLY(-4) 043329 .030064 -1.4412[.159] JGPHIL 028131 .17490 16084[.873] JGPHIL(-1) 17903 .22310 80246[.428] JGPHIL(-2) .087453 .21718 .40268[.690] JGPHIL(-3) .27284 .20371 1.3394[.189] JGPHIL(-4) 25621 .14521 -1.7645[.087] JGPHIL(-4) 25621 .14521 -1.7645[.087] Squared .86827 R-Bar-Squared .79466 E. of Regression .019705 F-stat. F(19, 34) 11.7951[.000] Pan of Dependent Variable 4.5541 S.D. of Dependent Variable .109705	DGMLY011091 034424 .82209	.417]
JGMLY(-2) .071673 .041195 .078693[.938] JGMLY(-3) 010524 .039332 26757[.791] JGMLY(-4) 043329 .030064 -1.4412[.159] JGPHIL 028131 .17490 16084[.873] JGPHIL(-1) 17903 .22310 80246[.428] JGPHIL(-2) .087453 .21718 .40268[.690] JGPHIL(-3) .27284 .20371 1.3394[.189] JGPHIL(-4) 25621 .14521 -1.7645[.087] JGPHIL(-4) 25621 .14521 -1.7645[.087] Squared .86827 R-Bar-Squared .79466 E. of Regression .019705 F-stat. F(19, 34) 11.7951[.000] Pan of Dependent Variable 4.5541 S.D. of Dependent Variable .109705	JGMLY(-1) .0036587 .0342432218	.749]
>GMLY(-3) 010524 .039332 26757[.791] >GMLY(-4) 043329 .030064 -1.4412[.159] >GPHIL 028131 .17490 16084[.873] >GPHIL(-1) 17903 .22310 80246[.428] >GPHIL(-2) .087453 .21718 .40268[.690] >GPHIL(-3) .27284 .20371 1.3394[.189] >GPHIL(-4) 25621 .14521 -1.7645[.087] >Squared .86827 R-Bar-Squared .79466 E. of Regression .019705 F-stat. F(19, 34) 11.7951[.000] Pan of Dependent Variable 4.5541 S.D. of Dependent Variable .179466	GMLY(-2) .071673 .041454 .078693	.938]
XGMLY(-4) 043329 .030064 -1.2675/[.791] XGPHIL 028131 .17490 -1.4412[.159] XGPHIL(-1) 17903 .22310 80246[.428] XGPHIL(-2) .087453 .21718 .40268[.690] XGPHIL(-3) .27284 .20371 1.3394[.189] XGPHIL(-4) 25621 .14521 -1.7645[.087] XGPHIL(-4) 25621 .14521 -1.7645[.087] Squared .86827 R-Bar-Squared .79466 E. of Regression .019705 F-stat. F(19, 34) 11.7951[.000] Pan of Dependent Variable 4.5541 S.D. of Dependent Variable .17951[.000]	3GMLY(-3)010524 03932 1./399	.091]
XGPHIL 028131 .17490 -1.4412[.159] YGPHIL(-1) 17903 .22310 16084[.873] YGPHIL(-2) .087453 .21718 .40268[.690] YGPHIL(-3) .27284 .20371 1.3394[.189] YGPHIL(-4) 25621 .14521 -1.7645[.087] YGPHIL(-4) 25621 .14521 -1.7645[.045] Squared .86827 R-Bar-Squared .79466 YGPHIL(-4) .019705 F-stat. F(19, 34) 11.7951[.000]	XGMLY(-4)043329 0306426757	.791]
JGPHIL(-1) 17903 .22310 16084[.873] JGPHIL(-2) .087453 .22310 80246[.428] JGPHIL(-3) .27284 .20371 1.3394[.189] JGPHIL(-4) 25621 .14521 -1.7645[.087] Squared .86827 R-Bar-Squared .79466 E. of Regression .019705 F-stat. F(19, 34) 11.7951[.000]	XGPHIL -,028131 17400 -1.4412	.159]
XGPHIL(-2) .087453 .21718 80246[.428] XGPHIL(-3) .27284 .20371 1.3394[.189] XGPHIL(-4) 25621 .14521 -1.7645[.087] XGPUARE .86827 R-Bar-Squared .79466 Xen of Dependent Variable 4.5541 S.D. of Dependent Variable .79466	GPHIL(-1)1790316084	0777
XGPHIL(-3) .27284 .20371 1.3394[.189] XGPHIL(-4) 25621 .14521 -1.7645[.087] 1.6245 .78057 2.0812[.045] -Squared .86827 R-Bar-Squared .79466 E. of Regression .019705 F-stat. F(19, 34) 11.7951[.000]	XGPHIL(-2) .087453 .2231080246	.0/3]
XGPHIL(-4) 25621 .14521 -1.7645[.087] 1.6245 .78057 2.0812[.045] -Squared .86827 R-Bar-Squared .79466 E. of Regression .019705 F-stat. F(19, 34) 11.7951[.000] Pan of Dependent Variable 4.5541 S.D. of Dependent Variable .001	GPHIL(-3) 27284 20271 40268	-0/5] -428]
1.6245 .14521 -1.7645[.087] .5quared .78057 2.0812[.045] .5quared .86827 R-Bar-Squared .79466 .5. of Regression .019705 F-stat. F(19, 34) 11.7951[.000] .an of Dependent Variable 4.5541 S.D. of Dependent Variable .000]	GPHIL(-4) - 25621 - 20371 - 1.3394	. 673] . 428] . 690]
-Squared	1.6245	.428] .690] .189]
-Squared .86827 R-Bar-Squared .79466 E. of Regression .019705 F-stat. F(19, 34) 11.7951[.000] San of Dependent Variable 4.5541 S.D. of Dependent Variable .000]	**************************************	.428] .690] .189] .087]
E. of Regression .019705 F-stat. F(19, 34) 11.7951[.000] an of Dependent Variable 4.5541 S.D. of Dependent Variable	-Squared .86827 P_Par_Coursed	.428] .690] .189] .087] .045]
an of Dependent Variable 4,5541 S.D. of Dependent Variable 11.7951[.000]	E. of Regression .019705 E-stat	.428] .690] .189] .087] .045]
	an of Dependent Variable 4,5541 S.D. of Dependent Variable 11.7951	.428] .690] .189] .087] .045] ******
sidual sum of squares 013202 Equation for the label of the 043486	esidual sum of squares .013202 Equation Los likelite .(.428] .690] .189] .087] .045] ****** 79466 .000]
(alke Info. Criterion 127.9190 Schwarz Payorian Criterinood 147.9190	(alke Info. Criterion 127,9190 Schwarz Bayorian Criterinood 147	.428] .690] .189] .087] .045] ****** 79466 .000] #3486
V-statistic 2 1717 Bayes an Criterion 108.0292	V-statistic 2.1717 Scimarz Bayesian Criterion 108	.428] .690] .189] .087] .045] .045] .045] .000] .000] .000] .000] .000] .000]

ECM LAG 4.txt Diagnostic Tests ÷ Test Statistics LM Version F Version * ŵ يغ A:Serial Correlation*CHSQ((4) =3.2919[.510]*F(4. 30)= .48689[.745]* * ż B:Functional Form *CHSQ(1) =5.1928[.023]*F(1. 33)= 3.5110[.070]* * * C:Normality *CHSQ(2) =9.4809[.009]* 4 Not applicable ų, ÷ D:Heteroscedasticity*CHSQ(1)= .082201[.774]*F(1, 52)= .079277[.779]* ****** ********** A:Lagrange multiplier test of residual serial correlation B:Ramsey's RESET test using the square of the fitted values C:Based on a test of skewness and kurtosis of residuals D:Based on the regression of squared residuals on squared fitted values ß Estimated Long Run Coefficients using the ARDL Approach ARDL(4,4,4,4) selected Dependent variable is LOGSNG 54 observations used for estimation from 1991Q1 to 2004Q2 Coefficient Regressor Standard Error T-Ratio[Prob] 1.4961[.144] .44257[.661] -.96984[.339] 5.8819[.000] LOGINA .17616 .11775 .032910 LOGMLY 074361 LOGPHIL -.32652 .33668 5.1465 .87498 C Error Correction Representation for the Selected ARDL Model ARDL (4, 4, 4, 4) selected ependent variable is dLOGSNG 4 observations used for estimation from 1991q1 to 2004q2 Coefficient egressor Standard Error T-Ratio[Prob] LÖGSNG1 -.20845 .13243 -1.5740[.124] -1.3740[.127] -.049580[.961] -.31315[.756] .75609[.454] -.13328[.895] -1.1278[.267] _OGSNG2 -.0064139 .12936 _OGSNG3 -.040759 .13016 .OGINA .051518 .068137 .OGINA1 -.0082633 .061998 .OGINA2 -.076897 .068184 .OGINA3 -.065371 .079518 -.82209[.416] -.32218[.749 -.52391[.603 1.8787[.068 .OGMLY -.011091 .034424 .0GMLY1 -.017820 .034014 OGMLY2 .053853 .028666 OGMLY3 .043329 .030064 1.4412[.158] -.16084[.873] OGPHIL. -.028131 .17490 -.60473[.549] -.10707[.915] 1.7645[.086] 2.0812[.044] OGPHIL1 -.10409.17212 OGPHIL2 -.016633 .15535 OGPHIL3 .25621 .14521 1.6245 .78057 m(-1)-.31566 .12140 -2.6002[.013] ****** *********** st of additional temporary variables created: OGSNG = LOGSNG-LOGSNG(-1).OGSNG1 = LOGSNG(-1)-LOGSNG(-2) .OGSNG2 = LOGSNG(-2)-LOGSNG(-3) OGSNG3 = LOGSNG(-3) - LOGSNG(-4)

OGINA = LOGINA - LOGINA(-1)



R-Squared and R-Bar-Squared measures refer to the dependent variable dLOGSNG and in cases where the error correction model is highly restricted, these measures could become negative.

