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International portfolio diversification with special reference to emerging markets

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INTERNATIONAL PORTFOLIO DIVERSIFICATION WITH SPECIAL REFERENCE TO EMERGING MARKETS

By

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A Thesis Submitted in Partial Fulfillment of the Requirements for the Award of Master of Business- Finance

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ABSTRACT

This study evaluates the potential benefits that investors obtain from diversifying their portfolios into emerging markets when the time varying behavior of assets is considered. It also tests whether the existing asset-pricing model developed in the context of developed markets, which assumes complete integration, can explain the expected returns in emerging markets and determines the risk of investing in these markets using cross section and time series data. An international capital asset pricing model (ICAPM) with time varying moments developed by Harvey (1991) is adopted. The conditional asset-pricing model, which takes into account prevailing world economic factors, was used. The Generalized Methods of Moments (GMM) is used to test the model. Results indicate that some markets have become more integrated to the world markets than they were in the 1980s and other which failed to open their economies fully have become more segmented.

The thesis looks at regional markets of Latin America, Africa Sub-Sahara, Middle East and North Africa, East Europe and Asia. A number of authors have looked at the emerging markets of Asia and Latin America but little is known about the African, Middle East and East Europe markets. The innovation of this research is it looked at the behavior of assets in all regional global markets and sees if they behave differently.

DECLARATION

I certify that this thesis does not, to the best of my knowledge and belief:

Incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education;

(i) Contain any material previously published or written by another person except where due reference is made in the text; or

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Date 23 - 01 - 02

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CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND TO THE STUDY

This thesis seeks to evaluate how the theories of international portfolio diversification developed in the context of developed markets fit data taken from emerging markets. According to Caprio, Folkerts-Landau and Lane (1994) building sound finance in emerging markets requires more than just imitating the institutions of mature market economies. In this thesis, tests of theories developed in mature markets are used to see how well they apply to developing markets and to see where adjustments should be made. A focus is made on emerging markets across the globe. The markets analysed include Latin America, Sub-Sahara Africa, the North Africa and the Middle East, Asia and Eastern Europe. These markets have not developed substantially for various reasons such as poor market information, political instability, poor regulatory framework and iliquidity.

Empirical tests using portfolio theory have shown that there are gains to be obtained from international diversification where there is low correlation amongst the market returns. Studies by Grubel (1968) Levy and Sarnat (1970) Solnik (1974) and Lessard (1973, 1976) confirm this assertion. However, with increased integration of financial services in the developed world, markets tend to move together thereby reducing the opportunities for diversification. Comparatively, emerging markets appear not to be integrated with the major world indices and hence they still offer

diversification opportunities. Adler and Dumas (1983) point out that the level of the market imperfections tends to produce segmentation and the extent of segmentation itself has yet to be measured. Bekaert and Harvey (1995) in their country specific investigation find that some emerging markets display time varying integration.

Friend and Losq (1990) point out that the objective of international diversification is to eliminate unsystematic risk. This risk can be eliminated by appropriate diversification of assets. Empirical evidence indicates that diversification outside one's national boundary would prove profitable for reducing risk with the degree of benefit varying amongst different markets. It is believed that emerging markets around the world offer huge returns and a lot of attention has been focused on these markets since the early 1990s. Most developed markets deregulated their financial markets and floated exchange rates in the 1970s and some emerging markets followed suit in the 1980s and 1990s.

Furthermore, through the effort of the International Monetary Fund (IMF) and the World Bank most economies in less developed countries (LDC) were liberalized in the early 1990s. During this period, both individuals and institutional investors moved to these markets because they were attracted by high rates of return.

In this thesis the theories of international diversification are considered, in particular the international capital asset-pricing model. It is a well-accepted belief that investors should not risk everything on one endeavour. Markowitz (1952) identified a set of efficient portfolios. He also recognized that the appropriate risk facing an investor was portfolio risk. Further, his formulation of portfolio

optimisation leads to the fundamental point that the riskness of stock should not be measured by the variance of the stock but also by the covariances. It is therefore clear that in order to reduce risk one should diversify amongst stocks with returns that are not correlated. Even prior to Markowitz's classic work on modern portfolio theory, investors had long realized the importance of diversification although they could not quantify the benefits.

Diamond, Abdullah and Olson (1997) indicate that empirical findings suggest the integration of equity markets accelerated greatly in the second half of the 1980s and this led portfolio managers to revamp their asset allocation strategies to achieve maximum return per unit of risk. They also noted that markets in industrialized countries are becoming closely correlated and gains from diversification across the countries are partly nullified. These results have led portfolio managers to look for alternative investment strategies. One of the strategies used is investing in emerging markets that are not integrated with developed markets.

Empirical evidence shows that benefits of diversification among the security markets of developed countries has been eroded in recent years by increased integration and interdependence among those markets. Diversification into emerging markets holds the promise of improved performance (Errunza, 1983).

According to Pearvy (1994), emerging markets investments have become increasingly attractive to investors because of their handsome returns and overall diversification benefits. The low correlation of emerging markets with each other and as a group with developed markets provides the potential for enhancing the return

and reducing the risk of the total portfolio. However, caution must be taken since careful evaluation of these markets must be undertaken. In these markets investors have to cope with high market volatility, dramatic currency swings, economic and political instability, iliquidity, high transaction costs, rapid and unpredictable growth, constant change and a limited amount of reliable information.

1.1.1 Definition of Emerging Markets

Emerging markets are thought of as an investment alternative for both individuals and institutional investors and they have come to be accepted as a new asset class by many of the world's most successful investors. Pearvy (1994) argues that there is no universally accepted definition for an emerging market. However, the World Bank (1991) with the largest investment in these markets defines a developing country as one having a per capita GNP of less than US $7 910. Furthermore, Pearvy states that "emerging" implies change and growth which occur when people of a particular country aspire and drive for improved economic, social and political standards.

It is estimated that about 85 percent of the world population are in LDCs where there is only six percent of the world stock market capitalization. This disproportionate population-capitalization mix vividly shows that there is potential for future growth for stock in these markets.

1.1.2 Why invest in emerging markets?

The basic reason for investing in emerging markets is to add value and to reduce overall portfolio risk through diversification. It is also argued that social aspects motivate other investors to diversify into these markets. For instance the investment by the US pension fund after the trauma of the early 1970s was driven by the desire to reduce risk. This was however overtaken by the realization that the world offered many opportunities that were not available in domestic markets. The motive to add value to one's portfolio also pushed institutions into emerging markets. Adding value means doing better than the international or world index for some period by a reasonable margin.

Frenkel (1999) highlights the benefits of foreign portfolio investment as:

- Providing scarce external resources
- Improving access to foreign stock exchanges and reversing capital flight
- Improving long-term economic growth through their contribution to further development of the local market. The impact comes from demand for better information, institutional developments, market and trading regulations, increased local and foreign investor confidence and demand for better corporate governance.
- Foreign portfolio investment lowers the domestic cost of capital, improves project evaluation and risk management practices and increases local investor welfare.

In many countries, there are significant barriers to the dissemination of information and companies take time to disclose information. More often than not, they divulge less information than when compared with well-developed market practices. Khambata (2000) argues that efficient stock markets must be accompanied by a liberalization of the financial sector and prudent macroeconomic policies.

1.1.3 The Research objective

This study evaluates the potential benefits that investors obtain from diversifying their portfolios into emerging markets. These markets are very turbulent as shown by developments in South East Asia, Eastern Europe and Latin America in the last two decades. Studies by Harvey and Bekaert (1997) show that some emerging markets are integrated with world markets whilst others are still segmented. There is evidence that indicates that there are gains to be obtained from diversifying into markets where there is a low correlation with developed markets. Furthermore, it has been shown that emerging markets offer high returns and that the risks in these markets are high.

Given that the macroeconomic and fundamental factors that affect these markets are different from those of developed world, it is necessary to investigate their behavior. A number of studies focused on the vibrant emerging markets but did not cover the whole spectrum of all markets across the globe. Secondly, early studies of emerging markets had short observation periods. The thesis examines 14 emerging markets over a period of 15 years and 5 months and six over a period of six years and

5 months. In order for these developing markets to be incorporated in the global market place, it is necessary to study how they move with the rest of the world.

Research has shown that emerging markets offer high returns and their risk is high. Bekaert and Urius (1996) argue that analysis of the historic returns and covariances could significantly improve the risk return characteristics of one's portfolio by increasing holdings of emerging market stock. Investors found that there are shrinking benefits from "maturing" markets in Latin America and Asia and hence they have turned their focus on Africa and the transitional economies of Eastern Europe. Do these markets offer any opportunities to investors?

This research looks at the following questions and hypotheses:

- What are the returns and risk characteristics of these markets?

  Monthly returns from 1985:2 to 2000:6 are analysed to see how they compare with the developed markets of Japan, EAFE, USA and the MSCI world market.
- How do these markets correlate with each other and the major world markets?
- The Null hypothesis is that the security price behaviour of emerging markets is consistent with those of world markets in that the same asset pricing model drives return/risk relationships. This is empirically tested. The assumption is that the international capital asset pricing model (ICAPM) validly describes the return behaviour of mature markets. The thesis tests whether market returns in emerging markets are consistent with the model's predictions.

- The hypothesis that emerging markets are now integrated into world markets is tested. World information variables; world mean excess returns, the dividend yield, the spread between the Baa and Aaa bond rates and the US 90 day treasury bill rate are used to test this hypothesis. Furthermore, the influence of the local information variables are tested to see if markets are segmented.

- Did market integration increase in the last two decades? In this thesis it will be interesting to find out if emerging markets became more integrated during the period 1985:2-2000:6 by testing to see if the time varying hypothesis will still hold. The period under review (1985-2000) is a period when trade liberalization took place in most of the countries in the sample.

1.2 THESIS OUTLINE

This thesis is divided into seven chapters. Chapter 1 provides an introduction and gives a brief summary of the markets analysed. It further sets out the objectives of the study. Chapter 2 presents a review of literature on portfolio diversification; plus early studies, of both portfolio diversification in developed markets and portfolio diversification in emerging markets. Chapter 3 discusses the characteristics of emerging markets and it provides a country profile of the markets in the sample. Chapter 4 presents the theoretical framework and the research methodology. Chapter

5 analyses the results and chapter 6 draws the conclusions. In Chapter 7 suggestions for future research are given.

CHAPTER 2: REVIEW OF LITERATURE

2.1.1 Early studies

Research on international equity markets may be divided into four types. Major inroads into this area were begun in 1968 continuing into the 1970s. The work of Grubel (1968), Solnik (1974) and Lessard (1976) investigates the extent of correlations amongst national stock markets. The aim was to examine the risk reduction advantages offered by international diversification. A second approach focuses on the consistency of observed equity returns with theories of international asset pricing. A third approach looks at the flow of information and the transmission of shocks between national markets. The fourth type of research focuses on the extent of foreign return/risk benefits available to domestic investors. All types of research examine capital market integration from different angles. However, with increased financial innovation and the development of e-commerce, most markets are moving towards globalisation where international markets are considered as a single market. Research done so far indicates that not all markets are integrated into the global market and this gives investors the desire to invest in other parts of the world markets especially the emerging markets.

A number of studies indicate that there are gains to be obtained from international diversification. It is believed that gains from international

diversification are derived from relatively low correlations between portfolios in different countries. Adler and Dumas (1983) state that if national financial markets are not perfectly correlated investors should be able to reduce their portfolio-variance risk without sacrificing expected returns by international diversification. This insight gave rise to a series of papers by Grubel (1968), Levy and Sarnat (1970), Solnik (1974) and Lessard (1973 and 1976). These early studies find that risk is significantly reduced and returns increased by holding a portfolio that is internationally diversified for US investors. Furthermore, these studies looked at developed market economies only. Grubel (1968) use the correlation coefficients to test the integration of eleven developed markets. By calculating the correlation coefficients across equity returns on the stock exchange of various countries, Grubel linked capital market integration to the magnitude of these coefficients.

Levy and Sarnat (1970) also use the correlation coefficients in their empirical tests for international market integration. Like Grubel, their results indicate that there are potential benefits derived from international diversification due to low correlations between countries. Further they plot the efficient frontier for the 28 countries in their sample which are grouped as follows: (i) all countries (ii) high income countries (iii) Western European countries (iv) common market countries (v) developing countries and (vi) United States. Results indicate that there are more benefits obtained from investing in developing countries because of low correlations. There are still some benefits from investing in Western European markets and the common market whose frontier curves are below the U.S. curve.

However, Adler and Dumas (1983) argue that the covariance matrix of returns does not give information on the presence or absence of capital market integration and hence recent studies adopt capital asset pricing models. Solnik (1974(a) and 1974(b) and Lessard (1973) consider both the correlation coefficients and the capital asset pricing model to test how integrated the markets are. Like their predecessors, they also use the U.S. index as their world index benchmark.

A number of asset pricing frameworks have recently been used to study market integration and an overview is provided by Naranjo and Protopapadakis (1997). Studies of market integration in a capital asset pricing (CAPM) framework have been undertaken by Stehle (1977), Errunza and Losq (1985), Jorion and Schwartz (1986), Errunza et al (1992) and Bakaert and Harvey (1995). This thesis adopts this framework. An alternative approach is to use an arbitrage pricing theory (APT) framework, as represented by Cho et al (1986), and Gutelkin et al (1989). Some studies have adopted a joint framework using both CAPM and APT; see Korajczyk and Viallet (1989) and Mittoo (1992), whilst Wheatley (1988) uses a consumption based CAPM framework.

2.1.2 Asset pricing and portfolio diversification

Recent literature on the International Capital Asset Pricing Model (ICAPM) has concentrated on testing whether or not international capital market integration exists. Most of the work adopts the traditional Sharpe- Lintner model based on the standard assumption that the return on any security is a linear function of the return on the domestic market index. This study concentrates on this approach.

Akdogan (1995) further states that the CAPM assumes that the market portfolio is mean-variance efficient and that observations on a benchmark return for a single beta model are *a priori* available. It is usually assumed that returns on an observation are normally distributed and that probability distributions are independent and identical over time and the possible presence of serial correlation is ignored. In reality, this is not the case and to overcome this problem, Hansen (1982) and Hansen and Hodrick (1980, 1983) suggested a conditional CAPM. They demonstrated that once the expectation operators preceding excess returns are conditioned upon an information set which is a subset of the investors' information set, the benchmark return lies on the conditional mean-variance frontier. The conditional version of ICAPM was tested by Harvey (1991) and Harvey and Bekaert (1997) on both developed and developing markets.

Solnik and Longin (1995) study the correlation of monthly excess returns for seven developed markets over the period 1960-1990. They find that the international covariance and correlation matrices are unstable over time. The study also finds that international correlation increases when global factors dominate domestic ones and affect all financial markets.

Ferson (1995) and Harvey (1995) investigate the predictability of equity returns in relation to global economic risk for 18 developed markets. They examine models in which the conditional betas of the national equity markets depend on local information variables and the global risk premium depends on global variables. Their results indicate that the beta pricing models capture a substantial percentage of the

predictability for most of the countries in the sample. A single beta model using the world market index was compared with multi-beta models and the multi beta models provide better explanation of the predictability of returns. In this study, we also examine the impact of both global and local information variables on the emerging markets equity returns.

2.1.3 Portfolio diversification and emerging markets

Prior to 1980, the literature on emerging markets was almost non-existent. Harvey (1998) points out " much of the current work was initiated as a result of the World Bank Conference on Portfolio Investment in Developing Countries held in Washington in 1993.... Some of the ideas presented at the conference motivated much of the research, including my own, on emerging markets over the next five years."

The major research agenda for these markets was outlined and they included data validity issues. The IFC, which collected data for these markets, launched its data product in 1981 but data for nine countries were backtracked to 1975. The expected returns were found to be different from those in developed markets due to parameters changing through time and that the markets were not integrated into the world markets.

Errunza (1983) included emerging markets in internationally diversified portfolios. Results were encouraging; he finds that there was a low correlation between emerging markets and developed markets, which offers substantial gains

from diversification across markets. Errunza and Losq (1985) applied a mild segmentation hypothesis to U.S. and the lesser developed countries (LDCs) securities. The authors highlight market imperfections such as direct barriers, government impediments and capital controls as the major sources of segmentation.

Claessens (1995) points out that the large amount of portfolio flows to emerging markets has raised a number of policy and research questions. The questions include (i) What benefits does an investor in an industrial country gain from investing in developing markets? (ii) How well are these developing markets financially integrated with the markets of industrialized countries? (iii) How has this changed over time? (iv) To what extend is financial integration a function of changes in barriers to free capital movements? What exactly are these barriers in developing and developed countries? He points out that these questions 'are not answered exclusively; more experience and research on this important aspect of international markets will be necessary in the coming decade.' This thesis will try to answer some of these questions.

Harvey (1995) and Harvey and Bekaert (1997) indicate that the correlations between emerging and developed markets and between emerging markets themselves tend to fluctuate quite widely but do not increase significantly with time. They also note that the correlations between emerging markets and developed markets increase if market liberalization takes place in the emerging market or when world market volatility is high relative to local market volatility.

Bekaert and Urius (1996) study the benefits of diversification from emerging markets using US and UK traded closed end funds. They analyze the effects of liberalization using the mean-variance spanning test before and after liberalization on four countries. The results were robust for Brazil, India and Korea and for Taiwan, where the results were negative. They find significant diversification benefits for UK emerging market funds whilst these were not apparent for the US funds.

Garcia and Ghysels (1998) acknowledge the work of Harvey (1991, 1995) where risk loadings are allowed to vary through time. Using the models inspired by Harvey (1991, 1995) and Ferson and Korajczyk (1995), Garcia et al apply tests for structural stability to two conditional factor models: - (a) a world conditional CAPM based on country indices similar to Harvey and (b) a local conditional CAPM based on a set of size portfolios for each country. The purpose of the tests of conditional factor models is to determine to what extent this predictability is explained by a dynamic factor model in which the conditional expected return varies through time. They test the hypothesis that emerging markets are perfectly integrated. Results indicate that models relating the emerging market index to world or US returns are in general unstable and the local model relating to portfolio returns are stable.

Izan, Tan and Walsh (1998) examined the stability of the correlation structure of index returns from 16 emerging markets and four developed markets. Like Garcia et al (1998) they also focused on the stability of the correlation structures with time and how this affects benefits obtained from diversification. However, they assess the benefits available to an Australian investor who is interested in investing in emerging markets. They examine data from emerging and developed markets using efficient

frontier and spanning tests. Results indicate graphically and statistically that there are benefits obtained from investing in emerging markets.

Buckberg (1995) using Harvey's (1991) model examines the extent to which emerging markets behave like industrial markets in relation to the world portfolio and how the relation between emerging markets and the world portfolio has changed over time. Her results indicate that many emerging markets were integrated into the global markets during the period 1985 - 1991 but many reject the model during 1977 – 1984.

Emerging markets have undergone numerous changes in the last few years. The Asian markets went through crises in 1997 and have not fully recovered from these shocks. There was a combination of banking and currency crises. It quickly became debt crises, threatening to become a global systemic risk. This led to declines in stock indices, bond indices, output, exchange rates, and property values. Unemployment and inflation rose sharply and political and social instability set in. Christoffenson and Errunza (2000) argue that the very success led to complacency and a general denial of how serious the risks were at the national and global level. The underestimation of policy shortcomings and institutional weaknesses exacerbated the problem and this also led to deterioration in investor confidence. Furthermore, it is suggested that imbalances in the internal and external accounts, asset bubbles, inappropriate exchange rates policies, imprudent and excessive external borrowing by the public and private sectors, less developed capital markets and banking sectors, crony capitalism, information problems and lack of political

developments were contributory to the crises. In Eastern Europe, Africa and Latin America there were changes in governance in most countries.

The globalisation of financial markets has resulted in increases in net capital flows to emerging markets in Asia, Eastern Europe and Latin America. However, investors have ignored opportunities in Africa. Six of the African markets were amongst the world's top ten best performing equity markets in 1998 with returns as high as 179% in terms of US dollar returns. With low levels of correlation between African and developed world markets, the African markets represent ideal portfolio diversification opportunities. The economic and political factors that affect other developing markets are similar to those that affect the African markets.

It is against this background that this study seeks to explore how the behaviour of assets have changed over time using Harvey's (1991) model. The results will be compared with those of Garcia and Ghysels (1998), Harvey and Bekaert (1997) and Buckberg (1995) who used the same model.

CHAPTER THREE: CHARACTERISTICS OF EMERGING MARKETS

3.1.1 Stylised facts

The growth of emerging stock markets in the last two decades has attracted the attention of academics, practitioners and policy makers. Most of these markets embarked on market reforms by deregulating financial systems, liberalizing economic policies and regulatory frameworks and this resulted in high capital inflows. Levine (1991) suggests that well developed stock markets may promote risk diversification, liquidity, information processing and capital mobilization. In another study, Kunt and Levine (1995) find that large stock markets are more liquid, less volatile and more internationally integrated. In addition, countries with strong information disclosure laws, internationally accepted accounting standards and unrestricted international capital flows tend to have more liquid markets. On the other hand, countries with markets concentrated in a few stocks tend to have smaller, less liquid and less integrated markets. Appendix I shows that countries in Sub-Saharan Africa are less developed in terms of having lower market capitalizations and fewer stocks.

Both economic theory and practical experience suggest that financial liberalization can stimulate economic development. Most financial markets in developing countries and transition economies were managed through government intervention prior to the 1980s. Ceilings were imposed on bank interest rates, credit was allocated by administrative decision rather than market criteria and inflows of

foreign capital were strictly controlled. However, most countries, which embarked on liberalization, abolished these types of controls later. Research has shown that financial liberalization is an important component of a successful development strategy. However, if financial deregulation is implemented in isolation, it is unlikely to promote growth and may impede economic development. Developments in African and Asian markets indicate that in Asia where more favorable economic environment existed liberalization has been successful and in Sub-Saharan Africa where macroeconomic imbalances still exist, success has been minimal.

Globalization has altered the world economic landscape and integration has increased. New opportunities for developing markets are created via wider markets for trade, large private capital inflows and improved access to technology. During the period 1990-1994, private capital inflows to developing countries increased dramatically. The flows have become more diversified than in the past when bank loans dominated. Private fund flows to developing countries have increased in part because of these countries' policies. Structural policies in both source and recipient countries also contributed to greater international capital market integration. This has been achieved through deregulation and liberalization of markets, asset diversification and innovations, and internationalization of multinational operations. The level and pace of market integration varies widely across countries. In Asia, integration in world trade has risen rapidly in a sustained manner, whereas in Sub-Sahara Africa integration has been negative. In the Latin Americas and Europe, integration increased in recent years with a shift towards outward oriented reforms. These reforms promote efficiency, productivity and provide an encouraging environment for export and foreign investment.

According to Qureshi (1996), those countries that remain inward looking risk becoming marginalized in a global integrated market. Developments in the last decade have shown that integration brings important benefits but it also requires more discipline in economic management. The Mexican, Asian and Russian crises in 1994,1997 and 1998 underscored the need for critical sound policies in sustaining the confidence of financial markets.

Furthermore, Brahmbatta and Dadush (1996) argue that the pace and level of integration are empirically associated with economic growth. However, developing countries became less engaged in the world economy because of government policies that play an important role in determining the extent to which countries can draw the benefits of global integration for economic growth. The benefits of integration include exposure to new ideas, technologies and products, improved resource allocation, hightened competition as a spur to achieving world standards of efficiency, wider options for consumers and the ability to tap cheaper resources of finance internationally. The indicators of integration can be measured by the ratio of international trade and foreign direct investment, creditworthiness rating and the share of manufactures in export.

In finance, emerging markets provide an outlet that may offer higher returns as well as risk diversification for industrial countries. This sounds lucrative, but at what cost? In this section, the characteristics of developing markets are discussed. Empirical evidence suggests that developing markets differ from

developed markets in terms of returns, risks and policy attributes. These factors will be discussed in detail below.

- High volatility

Many developing countries do not have such broad industrial sectors as in the developed countries. Their firms come from very few industries. As a result, the returns of these firms tend to move in the same direction on any given day. This explains why variance is so high in segmented markets. High volatility may stem from small market effects and information imperfections. Generally, there are limited reporting requirements in most emerging markets and this means that investors have less information about the firms and receive less frequent updates than do investors in developed markets.

- Expected returns

Expected returns are very high. Foreigners are attracted to emerging markets for two reasons: prices are cheap and expected returns are high as compared to what could be earned in developed countries. Second, because of the different industrial compositions of emerging markets relative to developed markets the correlation of these markets' returns with world returns is lower than the correlation of developed market returns with world returns. The correlations, which are low or negative implies that the addition of emerging markets to a well-diversified world portfolio could enhance portfolio diversification.

- Increases in correlation have been considered to be evidence of market integration. However, this may be flawed in the sense that two countries may be completely integrated and at the same time, their equity returns may be uncorrelated. The low correlation could simply reflect the different industrial mixes in the two countries.

- Policy shortcomings

Many developing markets impose capital controls that insulate the local stock exchange from global markets. However, these protectionist policies lead to:

-Deterioration in investor confidence

-Inappropriate exchange rates

-Imprudent and excessive external borrowing by both public and private sectors

-Imbalance in the internal and external accounts

-Lack of political reforms

-Less developed capital markets and banking sector

- External factors
- Moral hazard from potential availability of multilateral financing and expectation of sovereign bailouts.
- Underestimation of credit and foreign exchange risk by domestic and international investors.
- Lack of competitiveness
- Stringent policy prescriptions that accompany rescue packages lead to economic hardships, human suffering and socio-economic instability.

- Transaction costs are very high
- Information asymmetries between the local and foreign investors

Bhattacharya, Montiel and Sharma (1998) find that there is information leakage. The markets are characterized by structural breaks, i.e., during trade liberalization that result from the opening up of capital markets. Research has shown that the type of information that impacts expected returns shifts from purely local information to information that is more global (Anchour, Harvey, Hopkins and Lang, 1998). Once the markets are open, they become sensitive to global factors.

- In many of these markets, there are frequent political, economic and financial upheavals. Aitken (1998) points that when it comes to emerging markets, foreign investors are reckless and ill informed, often overcome by euphoria and panic and swayed by fashion and herd behaviour.

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1.1 Theoretical Framework

In this thesis, the international asset-pricing model (ICAPM) is used to analyse how assets in emerging markets are priced. According to Levi (1990) the central question in international finance for asset pricing and their expected rate of return is whether they are determined in an integrated international capital market or in locally segmented markets. Asset pricing theory is designed to identify and measure risk as well as assign rewards for risk bearing. It also explains the differences in risk premium across assets. This theory helps us understand why different assets have different expected returns. Further, it helps us understand why expected returns change through time. The beta coefficient splits a security's return into a part that is perfectly correlated with a market portfolio and the residual that is uncorrelated with the market. Beta is used to analyse performance, control risk, and make conditional forecasts and set expected returns.

The Sharpe (1964) and Lintner (1965) Capital Asset Pricing Model is used to see if it is consistent with the behaviour of returns in emerging markets. The ICAPM

states that the expected return on any given risky asset in excess of the risk free rate is proportional to the expected return on the market in excess of the risk free rate.

$$E(r_{jt}) - r_{ft} = \beta_j (E(r_{mt} - r_{ft}) \quad \text{Where } \beta_j = \frac{\text{cov}(E(r_{mt}, r_{jt})}{\text{var}(r_{mt})} \quad (1)$$

The model assumes that investors divide their wealth between risky assets and riskless assets in proportions that that depend on the investor's risk aversion. Investors have a choice of buying stocks from many countries rather than a single market and it includes all assets in the world. In choosing a portfolio of risky assets, investors seek a high-expected return to variance ratio. Under the model, optimisation behaviour leads investors to care only about covariance risk with the market portfolio and no other source of risk.

Emerging markets present challenges to the ICAPM in the sense that assets in these markets may display high returns and high risk or high risk and low returns. Asset pricing models are designed to identify and measure risk as well as assign rewards for bearing risk. To understand the issues that we face with asset pricing in emerging markets, it is useful to follow the framework of Sharpe and Lintner. CAPM suggests that investors hold diversified portfolios and this is what Markowitz (1959) explored in his portfolio selection paper. The risk of a well-diversified portfolio is its variance. Investors are worried about the variance of a portfolio and not an individual asset. Correlations are what matters. It is possible that a very high variance asset can reduce the overall portfolio risk because it may have low or negative correlation with portfolio returns. A high volatility asset with low correlation provides the hedge for

the overall portfolio. This asset is judged on how it contributes to the variance of a well-diversified portfolio.

The major assumptions of the CAPM are: investors only care about means and variances; asset returns are multivariate normally distributed; capital markets are perfect; there are no transaction costs, no taxes etc and there are no disagreements about the return distributions. In an international setting, the assumption of perfect markets implies that markets are perfectly integrated, which implies that assets with the same expected returns have the same variance or risk. A necessary condition for this to work is that there are no barriers to portfolio investment across borders. Harvey (2000) posits that the international CAPM version comes from the assumption of total market integration. This means that assets within a particular country are rewarded according to their contribution to a well-diversified world portfolio. Investors can diversify away all risks except the covariance of an asset with the world market portfolio. The only risk that investors will pay a premium to avoid is covariance risk with the world index.

The traditional CAPM does not handle the dynamics of market integration and hence the time-varying integration model suggested by Harvey (1989, 1991,and 1995) provides a suitable framework for valuation of emerging markets assets. Harvey (1991) contends that in a financially integrated global market, the conditional expected return on a portfolio of securities from a particular country is determined by the country's world exposure. He dwells on time-varying expected returns and risk and their implications for understanding the behaviour of asset pricing both in a

domestic and international setting. Country risk is defined as the covariance of the country returns with world stock returns. The assumption made about integration is that assets with the same risk have identical expected return irrespective of their national market. Furthermore, risk refers to exposure to some world factor.

This study uses the conditional asset pricing approach to test the Sharpe-Lintner model. Traditional approaches to asset pricing measurement are unconditional which means that they use historical average returns to estimate expected performance. Unconditional measures do not account for the fact that risk and expected returns may vary with the state of the economy. In recent years, researchers have focused on conditional distributions where one needs to identify the state variables that serve to condition returns. Furthermore, we need to verify whether conditional distributions satisfy some asset pricing restrictions. Conditional refers to the use of conditioning information (Z_{t-1}) to calculate expected moments and to test properly the ICAPM as a relation between expected return and ex-ante risk. The conditional formulation restricts the conditionally expected return on an asset to be proportional to the asset's covariance with the market portfolio, yet allows expected returns to vary over time.

Bekaert and Harvey (1995) define a segmented market as a market whose returns may covary with the rest of the world but the world market index which will have little or no ability to explain its returns. In a segmented market, securities tend to move together because they are affected by similar domestic conditions such as interest rates, national growth, budget deficits and inflation. This creates a strong

positive correlation among national securities traded on the same market. In a segmented market variance becomes the relevant measure of market risk and in a perfectly integrated market covariance matters.

Empirical studies done in developed markets using asset-pricing theory indicate that world capital markets are integrated (See for example; Dumas 1994, Dumas and Solnik 1995, Wheatley 1988, and Harvey 1991). The CAPM is a single factor model with one source of risk and is often used in domestic markets. Adler and Dumas (1983) and Solnik (1974) argue that this model cannot be applied to international stock market returns simply because it can describe international stock market returns only if investors have identical preferences (Claessens, 1995).

The work of Harvey (1991, 1995) adopts a dynamic asset pricing model in which risk loadings are measured with respect to world market returns in excess of a risk free asset return. The risk factors are allowed to vary through time. This factor is essential in analysing emerging markets where the internal dynamics underlying the country return index together with unstable macroeconomic conditions can bring considerable variation in the factor loading.

4.1.2 Generalized Method of Moments

Research has shown that GMM has become an important technique for estimating and testing financial asset pricing models because of its simplicity, flexibility, and generality. Ferson and Foerster (1994) find that the GMM coefficient estimators are approximately unbiased in simple models. The GMM estimator can be reliable with a small number of equations and instruments and as few as 60 time series observations.

The basic idea behind the GMM procedure is to exploit the moment restrictions $E[u_{t+\tau}] = 0$ to construct a sample objective function whose minimizer is a consistent and asymptotically normal estimate of the known vector θ_0. In order to construct such an objective function we need to make some assumptions about the data generating process (DGP).

The GMM approach is used to estimate a constant proportionality factor beta (β). This research paper adopts the Harvey (1991) methodology. The estimates in this thesis impose the restrictions that beta is constant over time and tests whether expected returns in the local markets are proportional to the expected returns on a benchmark portfolio i.e., the world index.

Robust test of CAPM can be constructed using a GMM framework.

Within the GMM framework the distribution of returns conditional on the market can be both serially dependent and conditionally heteroscedastic. We need only to assume that excess asset returns are stationary and ergodic with finite fourth moments.

The required moment conditions follow from the excess return market model. The residual vector provides N moment conditions and the product of the excess return market and the residual vector provides another moment condition.

$$f_t(\theta) = h_t \bullet \varepsilon_t \tag{2}$$

where $h'_t = [Z_{mt}, \varepsilon t = Z_t - \alpha - \beta Z_{mt}, \theta' = \alpha'\beta']$

The specification of the excess return market implies the moment condition

$E(f_t(\theta) = 0$ forms the basis θ_0 is the true parameter vector. This moment condition forms the basis for estimation and testing parameters using a GMM approach. GMM chooses the estimator so that the linear combination of the sample average of these moment conditions are zero.

For the sample average, we have $Q_T(\theta) = \frac{1}{T}\sum_{t=1}^{T} f_t(\theta)$. (3)

The GMM estimator θ is chosen to minimize the quadratic form,

$$Q_T(\theta) = gT(\theta)'WgT(\theta), \tag{4}$$

where W is a positive weighing matrix.

Advantages

The GMM forecasting method handles linear and non-linear problems. The method provides test statistics, which are robust to departures from the traditional distributional assumptions. The use of GMM allows for rigorous hypothesis testing of the model specifications.

The GMM approach provides a unifying framework for the analysis of many familiar estimators and encompasses least squares, instrumental variables and maximum likelihood. It is a convenient method of estimation in certain models, which were computationally very burdensome to estimate. The method handles linear and non-linear problems. It provides test statistics, which are robust to departures from the traditional assumptions.

Ferson and Foerster (1994) indicate that one reason for using the GMM approach in financial models is its generality and its ability to handle conditional heteroskedasticity.

4.1.3 Instrumental Variables

These are variables used by researchers to predict returns in one country or in a multi-country setting. The idea behind their use is that the expectations in the model should be conditioned on the current state of the global economy as captured by these variables. Predictability is constructed on regressing returns over time on

these variables. Fama and Schwert (1977) Rozeff (1984) Keim and Stambaugh (1986) Fama and French (1988) and Campbell and Shiller (1988) have shown that stock returns are predictable on the basis of the following variables: dividend yields, short-term interest rates, the spread between long term and short term bond yields (term structure premium), the spread between corporate and government bonds (default risk spread), stock market returns and exchange returns as well as dummy variables proxying for the January effect and days of the week effect. Fama and French (1988) find that the above variables are closely associated with economic conditions and are the best variables for forecasting future returns in econometric tests.

Normally stocks with high dividend histories are expected to be priced higher than a security with low dividend histories. Therefore, the inclusion of dividends in a test of CAPM may explain stock returns better. Bar- Yosef and Kolodny (1976); Crockett and Friend (1988) and Christie (1990) find that there is a positive relation between dividend and stock returns.

Chen, Roll and Ross (1986) find that the betas on economic variables may add to the explanatory power of the cross section of expected returns. They examined the spread between long-term government bonds and treasury bills, the return differential between long term corporate bonds and long term government bonds, growth in industrial production and change in inflation rates. They find that betas on these factors significantly determine the expected returns on securities.

4.1.4 Conditional CAPM

The assumptions of the CAPM do not recognize that the business environment is ever changing. The beta coefficient is assumed constant and therefore does not completely describe returns generated in different markets. The CAPM assumes that stock return distributions are time invariant in nature and investors share identical expectations about the mean and variance of return distributions. However, Bollerslev and Engle and Woodridge (1988) and Schwert and Seguin (1990) find evidence of time varying return distributions suggesting that moments of return distributions behave like random variables rather than constants as assumed by the CAPM. The time varying nature of moments is now incorporated into CAPM and the modified version, the conditional CAPM explains stock return variation. Harvey's (1989, 1991, 1995 and1997) work recognizes that the beta coefficient is not constant over time. Early studies of asset pricing models by Blume (1971), Gonedes (1973), and Officer (1973) also concluded that portfolio risk changes over time. Fama and French (1988) examined returns and find that expected returns are higher during depression and lower when business is strong. They suggested the variation in expected returns in relation to risk is related to default premiums, term premiums and dividend yields. Francis and Fabozzi (1979) also find that the instability of the beta is related to business conditions.

Jagganathan and Wang (1996) posit that the risk of a firm changes with business cycles, thereby causing a change in the firm's beta. Furthermore, they argue that if the business cycle is influenced by either technology or taste shocks then the

relative shares of the sectors in the economy vary and this has the effect of changing the betas of companies operating in these sectors. These observations have motivated the study of the conditional CAPM where beta changes depending on the available information.

Howton and Peterson (1999) empirically test a dual cross sectional model of expected security returns. In their model, risk is allowed to vary through time by predicting market and economic states. They regress returns on firm markets and economic factors, betas, book to market equity and earnings price ratios. The conclusion was that risk premium varies across market and economic states.

4.2 METHODOLOGY

4.2.1 The econometric model

This thesis uses the conditional version of the CAPM to test determinants of returns in emerging markets and compares the results with those obtained in developed markets. 'Conditional' means the use of conditioning information, that is, some information set Z_{t-1} to calculate expected moments and to test properly the ICAPM as a relation between expected returns and ex-ante risk. The conditional version of the Sharpe (1964) and Lintner (1965) asset-pricing model restricts the conditionally expected return on an asset to be proportional to its covariance with the market portfolio. The proportionality factor is the price of covariance risk which is the expected compensation that the investor receives for taking on a unit of covariance risk. The model is given as:

$$E\left[r_{jt}\middle|\Omega_{t-1}\right] = \frac{E[r_{mt}|\Omega_{t-1}]}{Var[r_{mt}|\Omega_{t-1}]} Cov\left[r_{jt} r_{mt}\middle|\Omega_{t-1}\right] \qquad (5)$$

Where r_{jt} is the return on a portfolio of country j equity from time t-1 to t in excess of the risk free return, r_{mt} is the excess return on the world market portfolio, and Ω_{t-1} is the information set that investors use to set prices. The ratio of the conditionality expected return on the market index $E\left[r_{mt}\middle|\Omega_{t-1}\right]$ to the conditional variance of the market index $Var\left[r_{mt}\middle|\Omega_{t-1}\right]$ is the world price of covariance.[1]

[1] For the Sharpe-Lintner model to hold in an international framework some auxiliary assumption must be made. The assumption that world market portfolios are perfectly correlated with world

Harvey first specified a model of the conditional first moment and assumed that investors process information using a linear filter:

$$R_{jt} - r_{t-1} = Z_{t-1}\delta_j + u_{jt} \qquad (6)$$

$$E(u_{jt}|Z_{t-1}) = 0 \qquad (7)$$

Where u_{jt} is the investor's error for the return on assets j, Z_{t-1} is a row vector of predetermined instrumental variables, which are known to the investor and δ_j is a column vector of time invariant forecast coefficients.

Given the assumptions the conditional first moment (1) can be rewritten:

$$Z_{t-1}\delta_j = \frac{z_{t-1}\delta_m}{E[u^2_{mt}|z_{t-1}]} E[u_{jt}\, u_{mt}|z_{t-1}] \qquad (8)$$

Where u_{mt} is the investor's forecast error on the world market portfolio $E[u^2_{mt}|Z_{t-1}]$ is the conditional variance and $E[u_{jt}u_{mt}|Z_{t-1}]$ is the conditional covariance.

Next, multiply both sides of equation (4) by the conditional variance:

$$E[u^2_{mt} Z_{t-1}\delta_j|Z_{t-1}] = E[u_{jt}u_{mt} Z_{t-1}\delta_m Z_{t-1}] \qquad (9)$$

Notice that the conditionally expected returns on the market and country portfolio are moved inside the expectation operators. This can be done because they are known conditional on the information Z_{t-1}. The deviation from the expectation is:

$$h_{jt} = u^2_{mt} Z_{t-1}\delta_j - u_{jt}u_{mt} Z_{t-1}\delta_m, \qquad (10)$$

where h_{jt} is the disturbance that should be unrelated to the information under the null hypothesis that the model is true. h_{jt} is a pricing error which implies that the model is overpriced when h_{jt} is negative and under priced when h_{jt} is positive.

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consumption is made. The model is viewed as testing the mean variance efficiency of the world

The econometric model to test the asset pricing restrictions is formed by combining equation 2 and 6

$$\varepsilon = (u_t \quad u_{mt} \quad h_t) = \begin{pmatrix} [r_t - z_{t-1}\delta]' \\ [r_{mt} - z_{t-1}\delta_m]' \\ [u_{mt}^2 z_{t-1}\delta - u_{mt}u_t z_{t-1}\delta_m]' \end{pmatrix}' \qquad (11)$$

where u is a 1x n (number of countries) vector of innovations in the conditional means of the country returns. The model implies that $E[\varepsilon_t | z_{t-1}] = 0$. With n countries, there are n +1 columns of innovations in the conditional means (u and u_m) and n columns in h.

Hansen's (1982) generalized method of moments (GMM) is used to estimate the parameters in equation (7). The GMM forms a vector of the orthogonality conditions $\mathbf{g} = \text{vec}(\varepsilon' Z)$ where ε is the matrix of forecast errors for T observations and 2n + 1 equations and Z is a T x *l* matrix of observations on the predetermined instrumental variables. The parameter vector δ is chosen as to make the orthogonality conditions as close to zero as possible by minimizing the quadratic form **g′wg** where the **w** symmetric weighing matrix that defines the metric used to make **g** close to zero. The consistent estimate of **w** is formed by

$$\left[\sum_{t=1}^{T} (\varepsilon_t \otimes z_{t-1})'(\varepsilon_t \otimes z_{t-1})\right]^{-1} \qquad \textbf{(12)}$$

The ε depends on the parameters. As a result, the estimation proceeds in stages. An initial estimate of the parameters is obtained by using an identity matrix for **w.** These parameters are used to calculate ε and a new weighing matrix. The

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portfolios.

estimation procedure is repeated with this new weighing matrix. Hansen (1982) provides the conditions that guarantee that the estimates are consistent and asymptotically normal.

The minimized value of this quadratic form is distributed χ^2 under the null hypothesis with degrees of freedom equal to the number of orthogonality conditions minus the number of parameters. This χ^2 statistic which is known as the test of the over identifying restrictions will provide a goodness of fit test for the model. A high χ^2 statistic means that the disturbances are correlated with the instrumental variables. This is a symptom of model misspecification.

Equation (11) is estimated for each country. Equation (11) provides a test of the model's restriction that the conditionally expected excess return on a country portfolio is proportional to its conditional variance with the world return.

4.2.2 Data Sources and Description

A sample of twenty emerging markets and four developed markets is used in this study. The emerging markets were chosen from markets across the globe. The markets to be analysed comprise Argentina, Brazil, Chile, Czech Republic, Greece, Hungary, India, Indonesia, Jordan, Korea, Mexico, Malaysia, Nigeria, Philippines, Poland, South Africa, Thailand, Turkey, Venezuela and Zimbabwe. The above markets were chosen because they have information, which is available on the Emerging Market Data Base (EMDB). The data were obtained from the Data Stream database, which subscribes to the Standard and Poor indices (S & P) (formerly owned by the International Finance Corporation (IFC)) that provides value-weighted

indices of a representative sample of equities in each country. The S&P now maintains and manages the EMDB. The EMBD compiles the most comprehensive information for emerging markets. It has the longest histories and highest quality data sets for emerging markets. It covers 54 markets and more than 2200 stocks. The database is recognised as the world's premier source of reliable and comprehensive information and statistics on emerging stock markets. The data produced is comparable across national boundaries. Data are available annually, quarterly, monthly, weekly and daily. For this project, monthly indexes from January 1976 are used. The Database categorises markets into global, investable and frontier markets.

The S&P/IFCG indices are the core of the S&P family of emerging markets indices. Other indices, i.e., the investable and S&P industries are selected from constituents of the S&P Global indices. S&P Indices (2000) states that the S&P/IFCG Indices are intended to represent the performance of the most active stocks in their respective stock markets and the broadest possible indicator of the market movement. The S&P/IFCG Indices captures 60-75% of the total capitalization of all listed shares. It targets the most actively traded shares in terms of value traded and represents a well-diversified industry selection. The objective of this study is to find how assets behave in emerging markets, by looking at the CAPM relationship with the local index and the predictive power of local and global factors through time. The global index used is not adjusted for investability. The investable indices were introduced in 1993 and they reflect the accessibility of markets to foreign investors. They are designed to meet the needs of sophisticated international investors. EMDB started collecting stock market data in mid 1981. The EMDB were compiled because of the need for a better means to evaluate performance of these

stock markets than the local indices which are calculated in their own way and stocks selected by a different criteria. The EMDB's indices could easily be linked into composite, regional and industrial indices, which would better measure returns and diversification benefits from broad based emerging markets.

The markets selected for the study are listed in the International Finance Corporation Global Composite Index (IFCG). Furthermore, 18 of the markets are listed among the best performing emerging markets in the world. Nigeria and Zimbabwe are not among the best 23 performing emerging markets.

The period under consideration is from January 1985 to June 2000 and monthly data on equity indices was used. The countries are grouped according to data availability. 14 of the countries have data available from 1985:2 and 20 countries have data from 1994:2.

This period is of interest because many of the countries in the sample went through economic and political transformation. Most of the countries floated their exchange rates and liberalized their economies. In developed stock markets, a lot of deregulation and innovation took place.

In order to determine how correlated the markets are with the rest of the world indices the IFC index, the Morgan Stanley Capital International (MSCI) EAFE index, the US index and the Japan index were used. The S&P indexes are treated as stock portfolios. Data was obtained from the DataStream Database. Harvey (1991) points out that the MSCI indices are composed of stocks that broadly represent stock

composition in the different countries. Almost all stocks can be readily purchased by non-nationals. The MSCI also display high correlation with widely quoted country index returns, for instance there is a 99.1% correlation between the MSCI US returns and the New York Stock Exchange value weighted returns calculated by the Centre for Research in Security Prices (CRSP) at the University of Chicago. For Japan, there is a 93.8% correlation between the MSCI return and the Nikkei 225 return.

4.2.3 Data Collection

Background information on the markets analyzed was obtained from journals, books and the Internet. The data was down-loaded from the DataStream database. To test the CAPM relationship between each country index and the world market, the country index and a set of instrumental variables were used. The observations (T) in this study range from 75 to 185. The assets are country index monthly returns measured in excess of the three month US Treasury bill rate. N is the number of assets and there are 24 assets, that is, the 20 emerging markets, the world index, which proxied as the market portfolio, EAFE, USA and Japan. The number of instruments (L) ranges between five and eight. These are used as conditioning information available at time t-1, denoted by Z_{t-1} and include the constant, the dividend yield, the default rate, the spread between US Baa and Aaa bonds, and world index return. One of the objectives of this study is to examine whether emerging markets are integrated or segmented and hence local instrumental variables are included in the conditioning information. The local instruments include the country specific dividend yield, the rate of change of the exchange rate, the local index and a country based short-term interest rate.

4.2.4 Data Analysis

Data for all the markets and variables utilised were collected from the DataStream database. All the monthly returns were calculated in US dollars to make them comparable. The dividend yield and interest rates were scaled down by 12 to get the monthly dividend yield and interest rates.

Measure of the return index

Continuously compounded returns were calculated for the entire variables used in this study. The continuously compounded returns are defined as $R_{it} = ln\left(\frac{New\,Price}{Old\,Price}\right)$, where *ln* is natural log.

The continuously compounded returns were used because they are more likely to follow a normal distribution.

The excess returns were calculated for all the markets in the sample by subtracting the returns on the risk free asset from the total country returns and the world market returns.

The means, standard deviations and correlation matrices for excess equity returns and the dividend yields were calculated. Results for these calculations are shown in tables I and II (see chapters 5.1.1. and 5.1.3).

Regressions of country returns and common information variables

Regressions of country returns using world factors were used to predict returns. A linear regression was used to forecast country returns. The regression equation is:

$$R_{j,t} = \delta_{j,0} + \delta_{j,1}wlss_{t-1} + \delta_{j,2}spread_{t-1} + \delta_{j,3}ustb90_{t-1} + \delta_{j,4}wldy_{t-1} + \varepsilon_{j,t} \qquad (13)$$

Where

$R_{j,t}$ = country's conditional expected return

Wlss = excess return on the world index

Spread = the yield spread between the US Baa and Aaa rated bonds

Ustb90 = the US 90day Treasury bill rate

Wldy = Monthly dividend yield on the Standard and Poor 500 stock index

ε = Regression error

The conditioning information variables are available at time t-1 and are used to predict the next period returns for time t.

From this equation, the R^2 and the t-statistics are obtained. The R^2 measures the precision of the predictions and the statistic helps us to decide whether to accept the null hypothesis that the estimated coefficient is zero or to reject it. A Table of results for these regressions is shown in table III (in chapter 5).

Table IV is constructed in the same way as table III. However, local variables are also used. Column Z_{t-1} (1) is the same as the regression in table III and Column Z_{t-1} (8) uses local variables only. Columns Z_{t-1} (2) to Z_{t-1} (7) use mixed variables, which include both common and local variables.

4.2.5 Conditional CAPM

The GMM procedure was used to estimate the parameters of the conditional CAPM set in equation (11). The idea behind this is to choose parameters of the model to match the theoretical model as closely as possible given the data. The key ingredient to GMM is the specification of the moments or orthogonality conditions. The GMM estimation is based upon the assumption that the disturbances in the equations are uncorrelated with the instrumental variables. The GMM estimator selects parameter estimates so that the correlations between the instruments and disturbance are as close to zero as possible as defined by the criteria function. The model being estimated is set in the econometric model in section 3.2.1. There are 1 information variables and 1 x (2n+1) orthogonality conditions and there are 1 x (n+1) parameters to estimate leaving 1 x n overidentifying conditions to estimate. For each country there are 5 (2 +1) = 15 orthogonality conditions and 5 (1+1) parameters to estimate leaving five overidentifying conditions. In a situation where there are more moment conditions than parameters, not all moment restrictions will be satisfied. The weighting matrix determines the relative importance of the various moment conditions.

$$\left[\sum_{t=1}^{T}\left(\varepsilon_t \cdot z_{t-1}\right)'\left(\varepsilon_t \cdot z_{t-1}\right)\right]^{-1} \qquad (14)$$

Cliff (2000) points 'that an "optimal" weighting matrix requires an estimation of the parameter vector, yet at the same time estimating the parameters requires a weighting matrix. To solve this dependency, the common practice is to set the initial weighting matrix to the identity then calculate the parameter estimate. A new

weighting matrix is calculated with the last parameter estimates, then new estimates with an updated weighting matrix.'

In order to estimate the parameters in the model the iterative estimation requires starting values for the coefficients of the model. The initial coefficients were obtained by running a linear regression of the country excess returns on the common instrumental variables and local instrumental variables. The values of the coefficients from the regression were used to as the starting values for the iterative procedure. The iterating procedure continues until the change in the objective function is sufficiently small. The System of equations was used to estimate the parameters in equation (7). A system is a set of equations containing unknown parameters.

From the results u_t and u_{mt} (country and world error terms as defined in equations (3) and (4) were determined. The average conditional covariance was obtained by (u_t x u_{mt}) multiplied by1000 based on a single country estimation with common instrument set.[2]

To see how the model fits the data in an over-identified situation, where it will not be possible to set every moment to zero, a χ^2 statistic was calculated to determine how far the model is from zero. The J-statistic is used to carry the hypothesis tests from GMM estimations. For the common instrument set, there are 15 instruments to estimate 10 parameters and there are five overidentifying restrictions. For the local instrument sets, A and B there are 18 instruments to

[2] See Harvey (1991) table V.

estimate 12 parameters and there are six overidentifying restrictions to test. A high value of the χ^2 statistic signifies that the disturbances are correlated with the instrumental variables and the model may be misspecified.

CHAPTER FIVE: RESULTS

5.1.1 Statistical Description

Table I represents summary statistics for asset excess returns and the instrumental variables over the period 1985:2-2000:7. All returns are calculated in US dollars. Seven of the markets including the USA have mean excess returns higher than the world index. The other ten countries offer less attractive returns than the world market at a higher risk. The world portfolio has the lowest standard deviations when all countries are considered. Harvey (1991) found the same results for developed markets. In addition, evidence shows that emerging markets are more volatile than the three developed markets in the sample except for Jordan with a standard deviation of 0.0446 (See Appendix II) that is lower than that of Japan and the EAFE. Japan has a relatively high standard deviation when compared with other developed markets. This reflects the economic turmoil that Japan experienced in the last decade. Nigeria has both, a very low mean excess return (-0.0011) and a high standard deviation and this negates a priori expectations in terms of asset pricing theory.

The highest mean excess return over the sample period is from Chile and Argentina has the highest standard deviation. Chile, Greece, Indonesia, Malaysia, Mexico, the Philippines Thailand and Zimbabwe display significant first order autocorrelation. Autocorrelations measure the persistence or predictability of the market returns based on past market returns. Further, Zimbabwe continues to show

significant autocorrelations up to the fourth lag, this probably indicates market imperfections such as inefficiency and infrequent trading.

TABLE I: Summary Statistics for the Country Excess Returns and Instrumental Variables

PANEL A			Autocorrelation					
Variable	Mean return	Standard						
Equity returns		Deviation	ρ1	ρ2	ρ3	ρ4	ρ12	ρ24
Argentina	0.0127	0.2038	0.01	0.01	0.04	-0.06	-0.10	-0.01
Brazil	0.0059	0.1798	0.02	-0.05	-0.06	0.05	0.02	0.00
Chile	0.0175	0.0790	0.17	0.20	-0.01	0.02	0.08	0.03
Czech Republic	-0.0120	0.0926	0.17	-0.15	-0.23	-0.23	-0.16	-0.07
EAFE	0.0072	0.0511	0.01	-0.08	0.00	0.03	0.05	0.06
Greece	0.0132	0.1082	0.12	0.14	0.01	-0.08	-0.02	0.06
Hungary	0.0045	0.1201	-0.08	-0.11	0.01	-0.08	-0.14	-0.07
India	0.0040	0.0925	0.07	0.02	-0.06	-0.08	-0.09	0.00
Indonesia	-0.0137	0.1490	0.22	-0.11	-0.01	0.21	-0.11	0.05
Japan	0.0038	0.0725	0.05	-0.07	0.08	0.05	0.06	0.00
Jordan	0.0005	0.0446	0.01	0.00	0.13	-0.03	0.03	0.02

PANEL A			Autocorrelation					
Variable	Mean return	Standard						
Equity returns		Deviation	ρ1	ρ2	ρ3	ρ4	ρ12	ρ24
Malaysia	-0.0003	0.1036	0.13	0.20	-0.12	-0.06	-0.11	0.07
Mexico	0.0137	0.1367	0.24	-0.05	-0.05	-0.02	-0.04	0.02
Nigeria	-0.0011	0.1521	-0.01	-0.06	-0.09	-0.07	0.02	-0.02
Philippines	0.0102	0.1086	0.33	0.06	0.03	0.05	0.08	-0.01
Poland	-0.0062	0.1408	-0.10	-0.09	0.00	-0.20	-0.19	-0.06
South Africa	-0.0021	0.0880	0.01	-0.04	0.01	-0.23	-0.08	-0.19
Thailand	0.0010	0.1025	0.13	0.14	-0.06	-0.13	0.04	-0.12
Turkey	0.0005	0.1208	0.13	0.07	0.08	0.07	-0.13	0.00
USA	0.0095	0.0441	-0.02	-0.06	-0.05	-0.06	0.02	0.07
Venezuela	0.0035	0.1447	-0.01	0.16	-0.01	0.00	0.02	-0.04
World	0.0079	0.0424	0.01	-0.08	-0.03	-0.05	0.03	0.10
Zimbabwe	0.0080	0.1084	0.21	0.14	0.23	0.16	-0.03	-0.03

PANEL B

Variable	Mean return	Standard deviation	Autocorrelation					
			ρ1	ρ2	ρ3	ρ4	ρ12	ρ24
Dividend Yield								
Argentina	0.0103	0.0013	0.822	0.707	0.612	0.538	0.428	-0.038
Brazil	0.0029	0.0026	0.867	0.726	0.632	0.523	-0.054	-0.054
Chile	0.0041	0.0019	0.968	0.921	0.884	0.860	0.649	0.314
Czech Republic	0.0016	0.0006	0.845	0.750	0.693	0.594	0.155	-0.532
Greece	0.0042	0.0027	0.910	0.829	0.767	0.706	0.260	0.004
Hungary	0.0013	0.0006	0.870	0.775	0.702	0.619	0.392	0.056
India	0.0015	0.0006	0.913	0.867	0.831	0.797	0.519	0.364
Indonesia	0.0010	0.0006	0.906	0.801	0.732	0.672	-0.035	-0.205
Jordan	0.0028	0.0016	0.920	0.858	0.795	0.727	0.243	0.066
Korea	0.0016	0.0012	0.926	0.851	0.780	0.719	0.343	0.669
Malaysia	0.0017	0.0006	0.909	0.800	0.680	0.572	-0.077	-0.311

Variable	Mean return	Standard deviation	Autocorrelation					
Dividend Yield			ρ1	ρ2	ρ3	ρ4	ρ12	ρ24
Mexico	0.0020	0.0013	0.941	0.868	0.807	0.774	0.391	0.164
Nigeria	0.0058	0.0019	0.921	0.835	0.747	0.648	0.670	0.010
Philippines	0.0012	0.0012	0.882	0.765	0.648	0.601	0.213	0.282
Poland	0.0010	0.0005	0.857	0.743	0.605	0.479	-0.064	0.037
South Africa	0.0021	0.0003	0.802	0.677	0.501	0.372	0.022	0.789
Thailand	0.0030	0.0022	0.942	0.880	0.814	0.756	0.515	0.366
Turkey	0.0034	0.0018	0.826	0.695	0.589	0.519	0.188	0.123
Venezuela	0.0018	0.0014	0.974	0.947	0.932	0.923	0.606	-0.427
World	0.0023	0.0007	0.997	0.994	0.993	0.993	0.968	0.987
Zimbabwe	0.0544	0.0264	0.908	0.852	0.817	0.781	0.482	0.383

Variable	Mean return	Standard deviation	Autocorrelation					
			ρ1	ρ2	ρ3	ρ4	ρ12	ρ24
SPREAD	0.0063	0.0014	0.9554	0.9053	0.8590	0.8303	0.6878	0.5184
USTB90	0.0046	0.0012	0.9757	0.9432	0.9432	0.8822	0.5953	0.1140
World Dividend Yield	0.0023	0.0007	0.9900	0.9809	0.9722	0.9616	0.9184	0.9728

The statistics are based on monthly data from 1976: 2 - 2000:7. The country returns are calculated in U.S.dollars in excess of the holding period returns on the 90-day Treasury bill rate. The dividend yields are the average (over the past year) monthly dividend divided by the current month price level. The returns and dividend yields are from Standard and Poor Emerging Market Price Index. The instrumental variables are: the return for holding a 90day US Treasury bill, the yield on Moody's Baa rated bonds less the yield on Moody's Aaa rated bonds (spread) and the dividend yield on the Standard and Poor's 500 stock index less the return90 day bill.

5.1.2 What are the returns and risk characteristics of these markets?

From the analysis, emerging markets offer diversification benefits to investors when one looks at the risk-return characteristics of these markets. It does not follow that all markets offer the same benefits. The Asian markets have recently experienced financial crises but quickly improved in 1999-2000 although they have not fully recovered. For example, the Philippines is the only Asian country offering high returns for a given level of risk. The rest of the countries offer high risk and low returns.

The Latin American countries offer high returns at varying levels of risk. The results of the African and European countries are spurious for various reasons. Five of the markets, South Africa, Poland, Hungary Czech Republic and Turkey and have shorter observation periods and during this time they were affected by the Asian and the Russian crises. Furthermore, the transition economies have just moved from a closed economy to an open economy and this shift is not an easy move. South Africa recently gained its independence .Its variance is comparable to Japans but its returns are negative.

The means, standard deviations and autocorrelations of the countries' dividend yields are shown in panel B of table I. Zimbabwe, Argentina, Greece and Thailand have both the high means and standard deviations of the dividend yield. Studies have shown that dividend yields forecast future returns. A high dividend

yield may indicate that the stock price is depressed due to financial difficulties, high inflation and high interest rates. In such a situation investors tend to be, risk averse. Conversely, a low dividend yield may indicate that inflation and interest rates are low and investors are enthusiastic. Autocorrelation is significant for all the countries up to four months. It remains significant for the world market up to 24 months.

Panel C of table I provides summary statistics of the common instrumental variables. All the instrumental variables show high autocorrelation up to 24 months.

5.1.3 How do these markets correlate with each other and the major world markets?

The cross-country correlations are in table II. The sample period is 1985:02 to 2000:7 (186 observations) for 14 developing markets and the EAFE, Japan the USA and the world market. Six countries, Czech republic, Hungary, Indonesia, Poland, South Africa and Turkey have 77 observations. The correlations between the world market index and the developed markets are very high ranging from 68 percent to 92 percent. This probably indicates that the markets are integrated with the world market. Correlation between the world market and emerging markets varies with seven countries exhibiting 25 percent or less correlation. South Africa has the highest correlation of 59 percent and Nigeria is lowest at -0.07 percent. South Africa also exhibits a high correlation with the US and Japan. In addition, its correlation with other emerging markets is relatively high with an average of 42 percent. Nigeria also shows negative correlation with Argentina, the EAFE, Greece, Japan, Jordan, Korea,

South Africa and Turkey. This could explain why the mean excess return is very low for this country. Jordan also displays negative correlation with seven countries in the sample. Both Jordan and Nigeria are isolated from their regional economic groupings and this may explain their negative low correlations with other countries in the sample. Their low correlations may also indicate lack of integration with the world markets. Their average correlations are very low, Jordan with 0.09 percent and Nigeria with 0.05 percent. The European markets; Czech Republic, Greece, Hungary and Poland have correlations above 25.

A comparison of these correlations of returns with the results of Harvey (1995) and Buckberg (1995) indicate that correlations have increased over time. Harvey looked at the period 1976 to 1992 and found that the correlations between emerging markets and developed ones were low and in some cases negative. The correlations between emerging markets themselves were also low and negative. The striking feature was the low correlations between countries in the same regional groupings. Buckberg found similar results when she looked at the period 1985-1991.

During this period, only seven countries had correlations above 25 percent with the world index. In this analysis, 13 countries have correlations above 25 percent with the world index. This probably indicates that emerging markets are moving towards integration with developed markets. The average correlation between developed markets in the sample is 80.4 percent and for all the countries in the sample is 34 percent. Again, this scenario shows that there are still diversification opportunities in developing markets. One interesting observation is that the four countries with the highest market capitalizations; Brazil, Greece, Korea and South Africa have high correlations with the developed markets. This perhaps reflects the

level to which these markets allow foreign investors into their markets. In addition, they offer a variety of financial products and this makes these markets attractive.

Markets that were partially open during the period in question also show low correlations with the world markets, for instance, India, Jordan, Nigeria, Venezuela and Zimbabwe. In addition, these countries have the lowest market capitalization. The level of market development lags behind the rest of the markets in the sample. From these results, it would seem difficult for these markets to attract investments. India is known to have restrictive investment policies. Other factors such as taxes, political risk, inadequate trading information, inaccurate accounting information and illiquid markets all contribute to deter investments in these markets.

Table II: Correlations of Country Returns and Instrumental Variables

A. Equity returns

Portfolio	ARG	BRA	CHI	CZE	EAFE	GRE	HUN	INDO	IND	JAP	JOR	KOR	MAL	MEX	NIG	PHI	POL	SAF	THA	TUR	USA	VEN	WLD	ZIM
Argentina	1.00																							
Brazil	0.60	1.00																						
Chile	0.61	0.61	1.00																					
Czech	0.31	0.37	0.25	1.00																				
EAFE	0.51	0.48	0.47	0.25	1.00																			
Greece	0.30	0.25	0.37	0.36	0.36	1.00																		
Hungary	0.52	0.50	0.43	0.54	0.45	0.44	1.00																	
Indonesia	0.36	0.39	0.51	0.21	0.44	0.24	0.36	1.00																
India	0.13	0.24	0.39	0.38	0.20	0.32	0.32	0.20	1.00															
Japan	0.35	0.32	0.35	0.13	0.80	0.10	0.15	0.33	0.16	1.00														
Jordan	-0.01	0.10	0.14	-0.02	0.09	0.27	0.04	0.03	0.15	-0.09	1.00													
Korea	0.21	0.22	0.32	0.16	0.48	0.24	0.17	0.42	0.15	0.59	0.01	1.00												
Malaysia	0.42	0.29	0.53	0.35	0.44	0.25	0.41	0.56	0.33	0.29	-0.06	0.36	1.00											
Mexico	0.71	0.63	0.51	0.28	0.51	0.29	0.59	0.28	0.28	0.34	0.07	0.19	0.31	1.00										
Nigeria	-0.14	0.18	0.08	0.08	-0.13	-0.07	0.06	0.13	0.01	-0.16	-0.03	-0.06	0.08	0.04	1.00									
Philippines	0.48	0.40	0.56	0.22	0.54	0.24	0.43	0.66	0.13	0.39	-0.08	0.37	0.68	0.39	0.10	1.00								
Poland	0.46	0.42	0.38	0.58	0.39	0.28	0.63	0.20	0.26	0.23	0.07	0.24	0.38	0.54	0.05	0.33	1.00							
South Africa	0.56	0.44	0.55	0.24	0.58	0.41	0.45	0.35	0.19	0.46	-0.09	0.42	0.51	0.53	-0.06	0.59	0.41	1.00						
Thailand	0.41	0.34	0.45	0.16	0.52	0.16	0.29	0.62	0.13	0.44	-0.02	0.62	0.69	0.32	0.08	0.74	0.34	0.62	1.00					
Turkey	0.28	0.43	0.38	0.15	0.28	0.25	0.41	0.21	0.19	0.14	0.13	0.08	0.08	0.36	-0.15	0.20	0.30	0.29	0.11	1.00				
USA	0.50	0.43	0.46	0.16	0.69	0.29	0.51	0.46	0.12	0.43	0.08	0.32	0.44	0.48	0.02	0.54	0.43	0.49	0.55	0.25	1.00			
Venezuela	0.34	0.34	0.35	0.40	0.19	0.20	0.27	0.17	0.27	0.07	0.19	0.10	0.32	0.23	0.06	0.27	0.25	0.22	0.13	0.15	0.22	1.00		
World	0.55	0.49	0.51	0.23	0.92	0.36	0.52	0.48	0.18	0.68	0.09	0.43	0.48	0.55	-0.07	0.59	0.44	0.59	0.58	0.29	0.91	0.22	1.00	
Zimbabwe	0.27	0.33	0.41	0.25	0.22	0.12	0.23	0.31	0.35	0.27	0.04	0.42	0.29	0.23	0.10	0.28	0.30	0.26	0.28	0.13	0.25	0.25	0.25	1.00
Ave. Cor.	0.41	0.41	0.44	0.29	0.44	0.29	0.40	0.37	0.25	0.32	0.09	0.31	0.39	0.40	0.05	0.42	0.37	0.42	0.40	0.25	0.42	0.26	0.47	0.29

B. Dividend Yields

Country	Arg	Bra	Chi	Cze	Gre	Hun	Indo	Ind	Jor	Kor	Mal	Mex	Nig	Phi	Pol	SAf	Tha	Tur	Ven	Wld	Zim
Argentina	1.00																				
Brazil	0.40	1.00																			
Chile	-0.09	0.46	1.00																		
Czech	-0.04	0.64	0.43	1.00																	
Greece	-0.15	-0.55	0.05	-0.45	1.00																
Hungary	0.47	-0.26	-0.44	-0.32	0.39	1.00															
Indonesia	-0.31	-0.27	0.21	0.13	0.35	0.02	1.00														
India	-0.07	0.60	0.66	0.47	-0.16	-0.44	0.23	1.00													
Jordan	-0.27	-0.06	0.10	-0.16	-0.02	-0.37	-0.25	0.05	1.00												
Korea	-0.48	-0.24	0.36	-0.09	0.50	-0.24	0.53	0.31	0.00	1.00											
Malaysia	0.10	0.62	0.45	0.60	-0.31	-0.22	0.36	0.66	-0.31	0.18	1.00										
Mexico	0.32	0.58	0.30	0.59	-0.31	0.03	0.07	0.27	-0.36	-0.10	0.64	1.00									
Nigeria	0.30	-0.17	-0.73	-0.26	-0.28	0.35	-0.18	-0.51	-0.27	-0.45	-0.13	-0.06	1.00								
Philippines	-0.06	0.52	0.43	0.48	-0.55	-0.49	0.24	0.61	0.04	0.17	0.71	0.33	-0.04	1.00							
Poland	0.26	0.29	0.36	0.19	0.27	0.38	0.34	0.42	-0.39	0.15	0.40	0.14	-0.30	0.12	1.00						
South Africa	0.30	0.65	0.24	0.41	-0.41	0.01	-0.35	0.37	-0.03	-0.09	0.35	0.60	-0.02	0.41	0.08	1.00					
Thailand	-0.55	-0.38	0.34	0.07	0.40	-0.20	0.81	0.24	-0.14	0.72	0.26	-0.08	-0.34	0.25	0.22	-0.33	1.00				
Turkey	0.20	0.21	0.34	-0.08	0.53	0.34	-0.03	0.12	0.01	0.13	0.04	0.21	-0.37	-0.31	0.41	0.11	-0.10	1.00			
Venezuela	0.56	0.56	-0.30	0.15	-0.62	0.13	-0.67	-0.07	0.07	-0.66	0.03	0.19	0.46	0.15	-0.12	0.53	-0.84	-0.09	1.00		
World	0.02	-0.60	-0.24	-0.51	0.85	0.61	0.28	-0.43	-0.29	0.29	-0.30	-0.16	0.07	-0.68	0.16	-0.40	0.25	0.45	-0.48	1.00	
Zimbabwe	0.46	-0.06	-0.30	-0.40	0.48	0.67	-0.03	-0.15	-0.33	-0.07	0.00	-0.02	0.30	-0.42	0.34	-0.08	-0.22	0.51	0.11	0.67	1.00

C.Other Instrumental Variables

	Spread	UStb90	Wldy	Wlss
Spread	1			
UStb90	0.48	1		
Wldy	0.68	0.52	1	
Wlss	0.09	-0	-0.04	1

The correlations are based on monthly data from 1985:2 - 2000:7. The country returns are calculated in U.S.dollars in excess of the holding period return on the Treasury bill rate that is closest to 90 days to maturity. The dividend yields are the average (over the past year) monthly dividends divided by the current monthly price level. The returns and dividends yields are from Standard and Poor Emerging Market Price Indices. The instrumental variables are: the excess returns on the world index (Wlss), the U.S 90-day treasury bill rate, the yield on Moody's Baa rated bonds less the yield on Moody's Aaa rated bonds (spread) and the dividend yield on the Standard and Poor 's stock index less the return on the 90.

percent with both the world market and the USA. However, their correlation with Japan is low, less than 25 percent for all the four countries. The Latin Americas have relatively high correlations with the world, all above 49 percent except for Venezuela with 22 percent. This may suggest that the markets are integrated with world markets.

Furthermore, the Latin Americas group also shows a high level of correlations amongst themselves; for example, Argentina has a correlation of 72 percent with Mexico, 61 percent with Brazil and 60 percent with Chile. The Latin Americas and the Asian markets are more correlated with the USA than any other region in the sample.

The Asian markets are also highly correlated amongst themselves; for instance, the Philippines have high correlations with Thailand, Indonesia and Malaysia. Thailand's correlations with other Asian markets are above 60 percent. Contrary to assertions that Japan financed a number of restructuring programs in South East Asia in the last two decades, the correlation matrix suggests that three out of the five Asian countries in the sample are more correlated with the USA than Japan. India exhibits very low correlations with both developed and emerging markets. This is consistent with the fact that India has one of the most heavily regulated markets in the world. The average correlation for India is 25 percent.

In Sub-Saharan Africa, the correlations between the three markets in the sample are very low, and Nigeria and South Africa have a negative correlation. Zimbabwe has a correlation of 25 percent with both the world and the USA and 27

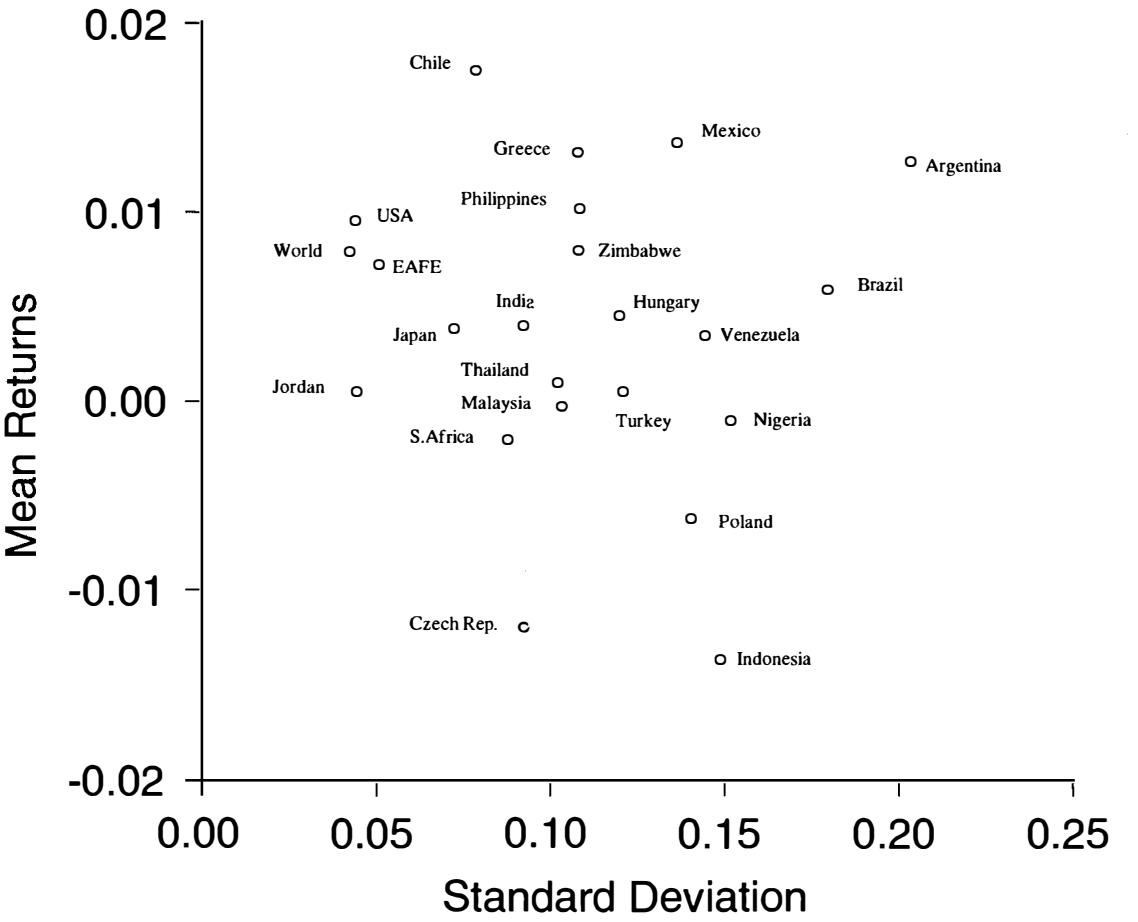
and 26 percent with Japan and South Africa. South Africa is Zimbabwe's biggest trading partner, and there are a number of companies with dual listings on both Johannesburg Sock Exchange and Zimbabwe Sock Exchange, but it is surprising that the correlation between the two countries does not reflect this. Zimbabwe has an average correlation of 29 percent with the markets in the sample.

Table II Panel A provides the dividend yield correlations. Most of the countries exhibit negative correlations with each other. Half of the emerging markets dividend yields are negatively correlated with the world market. Nigeria and Jordan have average dividend yields correlations that are negative. Jordan has insignificant positive low dividend yield correlations with Chile, India, Philippines Turkey and Venezuela. Nigeria correlates positively with Argentina, Venezuela, the world market and Zimbabwe only and the rest of the correlations are negative.

Figure I plots the traditional graph of mean excess returns against standard deviations for the 24 markets. Fourteen markets have 185 observations, Turkey has 162, Indonesia 126, and Czech, Hungary, Poland and South Africa have 78 observations. The developed markets are clustered together with low standard deviations and low returns. The Latin American markets have high excess returns and in the case of Argentina and Brazil, volatility is also high. Greece, Philippines and Zimbabwe have about the same standard deviations but the returns pattern differ. The Asian market, India, Thailand, Korea and Malaysia are clustered together with low excess returns and relatively high variance. Chile and Jordan exhibit interesting results. Chile has the highest excess return in the sample and its variance is slightly above that of developed markets. Jordan on the other hand has low excess returns

and low volatility about the same as that of developed markets. Of the five markets with a short observation period, Hungary is the only country with a positive reward /risk ratio. South Africa and the Czech Republic have negative excess returns and low risk while Poland and Indonesia offer the same pattern of returns and the risk is high.

FIGURE 1: Mean returns and variances for emerging markets and developed markets 1985-2000



Appendix IV exhibits the graphical analysis of excess returns correlations between the world market portfolio and emerging markets. The graphs show that for some markets like Zimbabwe, Venezuela and Nigeria, the markets were moving in the opposite direction during the October 1987 market crash. For the other markets, they show that they were moving in the same direction as the world portfolio although impact of the crash varied from country to country. The contagion effect of the Asian crises was felt by all markets save Nigeria and Jordan. These two markets are isolated in every respect from all other markets; they have the lowest average correlations and the graphical analysis confirms this observation. It appears that the transitional economies were affected more by the Russian crisis than the Asian crises as most negative returns were realized during 1998-99. During this time, the Asian markets were starting to recover. The Latin Americas graphs also reflect the impact of the Mexico crisis of 1994.

5.1.4 Predictability of Expected Returns Using World Factors

In this section, the null hypothesis that the security price behaviour of emerging markets is consistent with that of the world markets is tested. The assumption is that the ICAPM validly describes the return behaviour of mature markets. The thesis tests whether market returns in emerging markets are consistent with the model's predictions.

The results of regressions of country returns on a world common set of instrumental variables is shown in table III. The regressions are based on monthly data from 1985:2 – 2000:7 for 18 markets and for the six countries with a shorter observation period, the data is from 1994:2 – 2000:7. The results show an analysis of

predictable variation in the emerging market returns. Linear regressions of the emerging market returns on four information variables are detailed. The adjusted R^2 for Argentina, India, Jordan, Nigeria, the US and Venezuela are negative. The Philippines has the highest adjusted R^2 of 11 percent.

The world excess return beta is significant in explaining returns for Mexico only and the rest of the sample exhibit insignificant effects of the world excess return. The yield between the Moody's Baa and Aaa bond rates (spread) beta is statistically significant in seven markets, Chile and the world market at a 10 percent level of significance, EAFE, Japan, Korea, the Philippines and Thailand at a 5 percent level of significance. The US 90day Treasury bill rate beta is significant at a 5 percent level for Japan, Korea, Malaysia, Philippines and Thailand in predicting returns. The world dividend yield is insignificant in all the countries except for Greece. The constant is significant at a 5 percent level in the Philippines only. The world market portfolio betas have little influence on the expected returns in emerging markets.

TABLE III: Regressions of country excess returns on the common instrumental variables

Portfolio	δ_0 Constant	δ_1 Wlss (-1)	δ_2 Spread (-1)	δ_3 Ustb90 (-1)	δ_4 Wldy (-1)	R^2
Argentina	0.053	0.278	-6.833	-8.546	18.554	0.012
	[1.0750]	[0.8316]	[-0.6756]	[-0.9512]	[0.9613]	
Brazil	0.022	0.270	-4.663	1.595	0.834	0.006
	[0.6422]	[1.1343]	[-0.6466]	[0.2489]	[0.0606]	
Chile	0.021	0.146	4.421	3.926	8.435	0.040
	[1.3035]	[1.3286]	[-0.4045]	[-2.5602]**	[2.2078]**	
Czech	0.260	0.245	-14.183	-38.987	-25.551	0.056
	[1.3561]	[0.9215]	[-0.4902]	[-1.5199]	[-0.9133]	
EAFE	-0.023	0.009	9.010	-5.822	-0.240	0.046
	[0.2973]	[0.2025]	[1.3570]	[-3.1711]	[1.2981]	
Greece	0.046	0.069	-1.141	-2.490	-8.104	0.028
	[2.2397]**	[0.4928]	[-0.2689]	[-0.6605]	[-1.0007]	
Hungary	0.244	0.365	-14.147	-33.369	-20.087	0.034
	[1.0019]	[0.9863]	[-0.5595]	[-1.0509]	[-0.6304]	
India	0.001	0.167	-1.434	0.239	3.824	0.008
	[0.0558]	[1.4264]	[-0.4049]	[0.0758]	[0.5661]	
Indonesia	-0.076	0.393	25.370	-25.065	9.925	0.057
	[-0.8961]	[1.1972]	[1.5733]	[-1.8104]	[0.4211]	
Japan	-0.042	0.018	15.923	-10.219	-3.531	0.066
	[-0.9656]	[0.2005]	[2.3455]**	[-2.8744]**	[0.6821]	
Jordan	0.004	0.052	-4.401	-0.692	11.277	0.028
	[0.4251]	[0.7273]	[-1.9605]*	[-0.3356]	[2.5036]**	
Korea	-0.018	0.007	9.934	-9.839	1.891	0.024
	[-0.7926]	[0.0446]	[2.1054]**	[-2.3478]**	[0.2100]	
Malaysia	-0.021	-0.092	12.252	-16.841	8.831	0.039
	[-0.5494]	[-0.5066]	[1.6036]	[-2.2706]**	[0.5869]	

Portfolio	δ_0 Constant	Wlss (-1)	δ_2 Spread (-1)	δ_3 Ustb90 (-1)	Wldy (-1)	R^2
Mexico						
	[1.2723]	[2.6650]**	[-0.4368]	[-1.5553]	[0.9643]	
Nigeria	0.033	0.134	-9.089	2.183	5.582	0.005
	[0.5842]	[0.4957]	[-0.7978]	[0.1974]	[0.2488]	
Philippines	-0.085	0.214	22.648	-22.070	22.303	0.129
	[-2.2575]**	[1.1852]	[2.9773]**	[-2.9886]**	[1.4887]	
Poland	0.047	0.290	-43.652	-0.263	-18.702	0.010
	[0.2093]	[0.6601]	[-0.2740]	[-0.0070]	[-0.5302]	
South Africa	0.077	-0.393	-3.738	-24.958	17.925	0.053
	[0.5353]	[-1.4572]	[-0.0382]	[-1.0184]	[0.8279]	
Thailand	-0.036	-0.041	10.866	-15.736	16.437	0.058
	[-1.6397]	[-0.2733]	[2.4112]**	[-3.9326]**	[1.9121]*	
Turkey	0.014	0.524	-8.747	19.115	-16.340	0.028
	[0.1712]	[1.5399]	[-0.5460]	[1.3995]	[-0.5922]	
USA	0.009	-0.063	2.389	-3.917	-2.318	0.022
	[0.9845]	[-1.0013]	[1.2558]	[0.9084]	[0.2502]	
Venezuela	-0.069	-0.209	11.563	5.612	-10.691	0.014
	[-1.2960]	[-0.8148]	[1.0691]	[0.5345]	[-0.5019]	
World	0.005	-0.026	3.052	-5.271	3.079	0.038
	[0.5364]	[-0.4366]	[1.7152]*	[-3.3349]**	[0.9068]	
Zimbabwe	0.020	0.200	-3.965	-3.628	9.374	0.015
	[0.8454]	[1.2445]	[-0.8142]	[-0.8387]	[1.0088]	

The regressions are based on monthly data from 1985:2 -2000:7 The country returns are calculated in U.S. dollars in excess of the holding period return on the treasury bill that is closest to 90 days to maturity. The equity data are from Standard and Poor Emerging Markets Price indices. The t-statistics are in brackets. The model estimated is:

$$r_{j,t} = \delta_{j,0} + \delta_{j,1} wlss_{t-1} + \delta_{j,2} spread_{t-1} + \delta_{j,3} ustb90_{t-1} + \delta_{j,4} wldy_{t-1} + \varepsilon_{j,t}$$

The instrumental variables are: a constant, the excess return on the world index (Wlss) US 90-day treasury bill rate (ustb90), the yield on Moody's Baa rated bonds less the yield on Aaa rated bonds (spread) and the dividend yield on the Standard and Poor's 500 sock index less the return on a 90day bill.

Table IV: International Evidence of the Predictability of Equity Returns Using Common and Country Specific Instrumental Variables

	Z_{t-1} (1) C, Wlss (t-1) Spread (t-1), Ustb90 (t-1), Wldy (t-1)	Z_{t-1} (2) C, Rjt (t-1) Spread (t-1), Ustb90 (t-1), Wldy (t-1)	Z_{t-1} (3) C, Rjt (t-1), Spread (t-1), Ustb90 (t-1), Ldy (t-1)	Z_{t-1} (4) C Rjt (t-1) Spread (t-1), Ustb90 (t-1), Ldy (t-1), Wldy (t-1)	Z_{t-1} (5) C Rjt (t-1) Spread (t-1), Ustb90 (t-1), Ldy (t-1), Ex (t-1)	Z_{t-1} (6) C Rjt (t-1) Spread (t-1) Ustb90 (t-1), Ldy (t-1), Lir (t-1)	Z_{t-1} (7) C Rjt (t-1) Spread (t-1), Lir (t-1), Ldy (t-1)	Z_{t-1} (8) C, Rjt (t-1), Ldy (t-1), Lir (t-1) Ex (t-1)
Argentina	-0.018	-0.011	-0.012	-0.016	0.041	-	-	-
Brazil	0.004	-0.012	-0.018	-0.018	-0.035	-0.091	-0.074	-0.067
Chile	0.055	0.072	0.080	0.064	0.078	-0.026	-0.035	-0.038
Czech	0.005	0.014	-0.009	-0.025	-0.021	0.007	-0.050	-0.055
Greece	0.009	0.011	-0.005	0.013	-0.004	-0.018	-0.010	-0.017
Hungary	-0.018	-0.032	-0.045	-0.045	-0.050	-0.060	-0.045	-0.035
India	-0.014	-0.007	0.007	0.004	0.006	0.025	-0.003	0.003
Indonesia	0.011	0.054	0.060	0.051	0.065	0.055	0.035	0.014
Jordan	-0.004	-0.004	-0.013	-0.008	0.007	-	-	-
Korea	0.011	0.041	0.043	0.038	0.050	0.023	0.030	-0.001

	Z_{t-1} (1) C, Wlss(t-1) Spread (t-1), Ustb90(t-1), Wldy(t-1)	Z_{t-1} (2) C, Rjt(t-1) Spread (t-1), Ustb90 (t-1), Wldy(t-1)	Z_{t-1} (3) C, Rjt(t-1), Spread (t-1), Ustb90 (t-1), Ldy(t-1)	Z_{t-1} (4) C Rjt(t-1) Spread (t-1), Ustb90 (t-1), Ldy(t-1), Wldy(t-1)	Z_{t-1} (5) C Rjt(t-1) Spread (t-1), Ustb90 (t-1), Ldy(t-1), Ex(t-1)	Z_{t-1} (6) C Rjt(t-1) Spread(-1) Ustb90 (t-1), Ldy(t-1), Lir(t-1)	Z_{t-1} (7) C Rjt(t-1) Spread (t-1), Lir(t-1), Ldy(t-1)	Z_{t-1} (8) C, Rjt(t-1), Ldy (t-1), Lir(t-1) Ex(t-1)
Malaysia	0.018	0.025	0.037	0.036	0.042	0.065	0.024	0.103
Mexico	0.034	0.082	0.101	0.096	-0.015	0.066	0.028	0.030
Nigeria	-0.017	-0.019	-0.019	-0.025	-0.050	-	-	-
Philippines	0.110	0.160	0.176	0.179	0.165	0.171	0.153	0.140
Poland	-0.044	-0.019	-0.011	-0.018	-0.024	-0.012	0.000	-0.013
South Africa	0.001	-0.009	0.101	0.197	0.092	0.289	0.300	0.290
Thailand	0.044	0.052	0.044	0.049	0.055	0.050	0.040	0.025
Turkey	0.0017	0.003	0.039	0.044	0.044	-	-	-
Venezuela	-0.007	-0.011	-0.012	-0.018	0.016	0.023	0.027	0.021
Zimbabwe	0.010	0.085	0.089	0.084	0.080	0.097	0.102	0.099

The country returns are calculated in U.S. dollars in excess of the holding period on the U.S Treasury bill that is closest to 90-day maturity. The equity data are from Standard and Poor's Emerging Market Price Indices. The regressions are estimated with eight different sets of conditioning information. The instrumental variables are: excess world returns ($wlss_{t-1}$), U.S 90-day treasury bill rate ($ustb90_{t-1}$), the yield on the Moody's rated bonds less the yield on Aaa rated bonds ($spread_{t-1}$), the U.S dividend yield in excess of the 90 day treasury bill rate ($wldy_{t-1}$), the equity return for each country (Rjt_{t-1}), the dividend yield for each country (Ldy_{t-1}), The return on the US exchange rate for each country (Ex_{t-1}) level of short term interest rates in each country (Lir_{t-1}).

5.1.4 Predictability of returns using common and local instrumental variables

The hypothesis that emerging markets are now integrated into world markets is tested using world factor variables and local information variables. Table IV presents the results of international evidence about the predictability of returns using common and country specific instrumental variables. Z_{t-1} (1) comprises the common instrument set, that is, world excess returns, US 90 day treasury bill rates, the spread between the Moody's Baa and Aaa bond rates, and the world dividend yield. In Z_{t-1} (2) the world excess return is replaced by the country excess return. Z_{t-1} (3) uses the same variables as in (2) but substitutes the world dividend yield with the country dividend yield. Z_{t-1} (4) uses the same variables as in (3) plus the world dividend yield. Z_{t-1} (5) uses the same variables as in (3) pl plus returns on the US exchange rate for each country. Z_{t-1} (6) comprises the country excess return index, local dividend yields, local interest rates and the US 90day Treasury bill rates. Zt_{-1} (7) uses the country excess returns, local short-term interest rates and the spread as in Z_{t-1} (1). Z_{t-1} (8) uses all local instruments, excess returns, local short-term interest rates, and the local dividend yields. Columns Zt_{-1} (2) to Zt_{-1} (7) have mixed variables for common and local variables. Appendix V shows the date when the local instrumental variables started. The local dividend yields started in 1985:2 for the 14 markets with a longer observation period and in 1994:2 for the markets with a shorter observation period.

Argentina, Jordan, Nigeria and Turkey do not have the local interest variable and therefore use the return on the exchange rate, local dividend yields and the country excess returns as the local information set. The adjusted coefficients of

determination, in columns Zt_{-1} (2)- Zt_{-1} (4) do not show any statistical significance for Argentina. However, column Z_{t-1} (5) contains three local variables for Argentina, and there is a modest improvement on the adjusted R^2. The R^2 improves from –1.8 to 4.1 percent when Z_{t-1} (5) with more local instruments is used. For Jordan, the R^2 improves substantially when Z_{t-1} (5) is used although it is not significant. Nigeria's R^2 remains negative although it improved slightly when Z_{t-1} (5) is used. Turkey also exhibits the effect of local instrument set, an R^2 of 0.17 percent is shown with the common instrument set and it increases to 4.4 percent when local instruments are considered.

For Brazil, Chile, the Czech Republic, Greece, Korea and Thailand the world common variables regression captures the bulk of the predictable variation in the country returns. Column Z_{t-1} (8) with local instrumental variable regressions shows decreasing R^2, which are negative for all the above countries except for Thailand. The R^2 for Thailand decreased from 4.4 percent to 1.3 percent. Hungary shows a similar pattern as the above countries but its R^2 are negative. When a comparison of common information regressions and completely local information regressions is made for two Africa countries, South Africa and Zimbabwe; Malaysia, Indonesia, Mexico, Poland Philippines and Venezuela it is noted that they are more influenced by local factors than the world factors. For instance, Indonesia and Malaysia's R^2 double when local factors are used. However, for Mexico and the Philippines the R^2 increased moderately. South Africa's R^2 increased significantly from 0.1 percent to 30.1 percent. Zimbabwe's R^2 increased slightly from 10 percent to 10.5 percent. India shows a similar pattern as above, although the R^2 is decreasing, negative and

insignificant. For Poland, the R^2 moved from negative territory to zero and for Venezuela it increases from -.07 percent to 3.2 percent.

The impact of using mixed variables differs across the sample. When the local excess returns is used in regression Z_{t-1} (2) the explanatory power is increased for Chile, Czech Republic, Greece, Indonesia, Korea, Malaysia, Mexico, Philippines, Thailand Turkey and Zimbabwe. The explanatory power increases for Argentina, India, and Poland but it remains in the negative territory. For Brazil, Hungary, Nigeria, South Africa, Turkey and Venezuela the explanatory power decreases. The local excess returns and the local dividend yields increase the explanatory power of the regressions in 11 of the countries in the sample. For Jordan and Poland the R^2 are still negative. The R^2 decreased for seven of the markets in the sample and in six of the markets the R^2 are negative and insignificant. In column Z_{t-1} (4) two local instrumental variables, that is, the local excess returns, the local dividend yields are used and three common variables. The R^2 decreased further, in 13 of the regressions when we compare results with the previous column where we used two local variables and two common variables. However, when the regressions are compared with the common instrument information set in column Z_{t-1} (1), seven of the regressions have decreased and 13 increased. South Africa shows a substantial increase of the R^2 from 0.10 percent to 19 percent, Philippines from 11 percent to 17.9 percent, Malaysia from and 1.8 percent 3.6 percent and Mexico from 3.4 percent to 9.6 percent. Turkey and Indonesia also show substantial increases. The other six countries have insubstantial increases.

The effects of the explanatory power increase in 14 of the regressions when column Z_{t-1} (1) and Z_{t-1} (5) with three local information variables and two common instruments are compared. In the other six markets, the R^2 decreases substantially showing no explanatory power at all. Column Z_{t-1} (6) shows the effect of the local short-term interest rates. In 12 of the countries, the R^2 is better than the regressions of the first column. However, if it is compared to column Z_{t-1} (5) it appears that the local interest rate has more explanatory power than the exchange rate variable. For example, Czech Republic, India, Malaysia, Mexico, Philippines, South Africa and Zimbabwe the R^2 increased substantially.

In column Z_{t-1} (7), nine of the regressions show an explanatory power which is better than that of common instruments regressions. The last column contains regressions of local variables only and interesting results are displayed. The markets that are more integrated with the world markets have low and negative R^2 for example, Brazil, Mexico, Chile, Greece, Korea and Thailand. As for those markets that are less integrated the R^2 is high indicating the effect of local variables.

5.1.5 Conditional Asset Pricing with Time Varying Moments

Table V presents the results of estimating equation (7), which allows for time variation in expected returns, conditional covariance and conditional variance. Tests of the asset pricing restrictions are provided for individual countries. The hypothesis that the world market portfolio is conditionally mean variance efficient is tested.

The conditional variances are presented in column 2 of table V. Panel B presents the results for the six countries with a shorter observation period. The average conditional variance is high for all the developed markets and seven of the

developing markets. In panel B, five countries exhibit high average conditional covariance.

The average pricing error and the absolute pricing error are provided in columns four and five. The US average error shows that the actual returns are equal to the expected returns. In Chile, Japan, Korea, Mexico, Nigeria and Zimbabwe the pricing errors are negative indicating that the average returns are less than what is expected given the level of risk of each country. Four of the countries in panel B show the same results. The other 11 countries' pricing errors indicate that the actual returns are higher than the expected return given the level of risk. However, the absolute error for Argentina, Brazil, Indonesia and Turkey are high, above 10 percent.

The χ^2 statistic provides a test of the model's restrictions: a high chi-squared statistic indicates poor fit and a low one indicates goodness of fit. Three sets of instrumental variables are used, the common set, the local instrument A comprising the common instrument set plus the local dividend yields; and local instruments B include the local excess returns in place of the world excess returns. The model is rejected by Malaysia using the common instrument set and local instrument set A. Argentina, Greece, Korea and Thailand reject the model at a 5 percent level of significance when the local instrument set B is used. Indonesia rejects the model using the common instrument set.

The adjusted coefficients of determination (R^2) are the result of regressing the model's errors on the common information variables and are shown in column six of

table V. A small R^2 indicates that the model fits well. The R^2 are low for 15 countries in the samples. This suggests that the ratio of mean returns to variance is time varying. Indonesia and Malaysia have high-adjusted R^2 and they reject the model in the overidentifying restriction test using the common instruments set.

TABLE V: Estimation of a Conditional CAPM with Time Varying Expected Returns Conditional Covariances and Conditional Variances

Portfolio **Panel A**	Average Returns	Average Conditional Covariance	Average Error	Average Absolute Error	R^2	Common Instruments χ^2 [p-value]	Local Instruments: A χ^2 [p-value]	Local Instruments: B χ^2 [p-value]
Argentina	0.0127	0.466426	0.004461	0.125911	-0.016	6.09 [0.2977]	2.21 [0.8990]	13.09 [0.0416]
Brazil	0.0059	1.965704	0.007607	0.130755	-0.005	6.14 [0.2921]	6.58 [0.3619]	5.32 0.5038]
Chile	0.0175	0.859373	-0.00163	0.063683	0.051	7.75 [0.1708]	0.49 [0.9979]	9.52 [0.1462]
EAFE[a]	0.0072	1.9426	0.0005	0.0390	0.0035	5.73 [0.3330]		
Greece	0.0132	1.0644	0.0053	0.0754	0.0066	6.67 [0.2460]	7.24 [0.2580]	14.29 [0.0270]
India	0.0040	-0.1412	0.0019	0.0738	-0.0156	2.53 [0.7720]	7.68 [0.2628]	4.34 [0.6311]
Japan[a]	0.0038	2.2136	-0.0039	0.0555	-0.0056	4.88 [0.4304]		
Jordan	0.0005	0.2168	0.0005	0.0332	-0.0098	3.89 [0.5659]	5.92 [0.43234]	4.63 [0.5915]
Korea	0.0038	1.4794	-0.0107	0.0806	0.0045	6.23 [0.2794]	7.16 [0.3064]	10.14 [0.1188]
Malaysia	-0.0003	1.7963	-0.0004	0.0736	0.0166	19.37 [0.0016]	18.56 [0.0049]	5.28 [0.5080]
Mexico	0.0137	2.0859	-0.0024	0.0894	0.0306	6.06 [0.3004]	4.52 [0.6064]	3.97 [0.6810]
Nigeria	-0.0011	0.4198	-0.0015	0.0714	-0.0197	2.48 [0.7802]	0.73 [0.9938]	0.70 [0.9943]

Portfolio	Average Returns	Average Conditional Covariance	Average Error Error	Average Absolute R^2	χ^2	Common Instruments χ^2 [p-value]	Local Instruments: A χ^2 [p-value]	Local Instruments: B [0.4412] [p-value]
Thailand	0.0010	1.9739	0.0280	0.0923	0.0523	5.75 [0.3306]	4.39 [0.6237]	10.57 [0.1026]
Venezuela	0.0035	0.2081	0.0019	0.0999	-0.0054	3.67 [0.6132]	3.39 [0.6407]	2.48 [0.8504]
Zimbabwe	0.0080	0.6294	-0.0134	0.0737	0.0044	3.42 [0.6348]	4.14 [0.6581]	8.26 [0.2200]
Panel B								
Czech Rep,	-0.0170	0.6979	-0.0182	0.0628	-0.0028	6.7 [0.2440]	5.36 [0.4987]	4.36 [1.628]
Hungary	-0.0001	2.3549	0.0020	0.0810	-0.0271	3.62 [0.2440]	3.22 [0.7809]	4.92 [0.5536]
Indonesia	-0.0232	3.3671	-0.0241	0.1279	0.1054	17.67 [0.0033]	8.58 [0.1989]	5.36 [0.4981]
Poland	-0.0101	2.2269	-0.0124	0.0994	-0.0046	2.87 [.07206]	3.95 [0.6831]	2.83 [0.8302]
South Africa	-0.0021	1.8924	-0.0025	0.0596	0.0141	5.09 [0.4047]	3.78 [0.7063]	3.58 [0.7332]
Turkey	0.0100	2.0844	0.0162	0.1220	-0.0002	5.80 [0.3257]	5.09 [0.5322]	3.20 [0.7837]

The following system of equations is estimated with the generalized method of moments:

$$= \begin{pmatrix} [r_t - z_{t-1}\delta]' \\ [r_{mt} z_{t-1}\delta_m]' \\ [u_{mt}^2 z_{t-1}\delta - u_{mt} u_t z_{t-1}\delta_m]' \end{pmatrix}' \qquad (11)$$

where r_m is the excess return on the world portfolio, δ represents the coefficients associated with the instrumental variables, u is the forecast error for the country returns, u_m is the forecast error for the world market return and h represents the deviation of the country returns from the model's expected returns. There are three instrumental variable sets Z that are used in the estimation. The common set instrumental variables are: a constant, the excess returns on the world index, US 90-day Treasury bill rate , the yield on the Moody's Baa rated bond less the yield on the Aaa rated bonds and the dividend yield on the Standard and Poor's 500 stock index less the return on the 90 day bill. The local instrument set A is the common set instruments plus the country specific dividend yield. Instrument set B is the same as set A but the world excess return is replaced by the country specific excess returns.

a The local variables for EAFE , Japan and USA were not available on the DataStream bank and therefore the χ^2 for these countries could not be estimated.

CHAPTER SIX: FINDINGS

6.1 CONCLUSION

Our results have shown that asset pricing behaviour in emerging markets is changing even though it is different from country to country. Ostensibly, some markets became more integrated with the world markets whilst others became more segmented over time. In most markets in the sample, correlations with the developed markets increased. However, this has not hindered investments in these markets. Investors still find benefits from investing in these markets probably because returns remain higher than in developed markets. The increase in integration has been due to rising capital flows from developed markets. In markets where integration has increased over the years, the countries are making concerted effort to catch up with the developed world in terms of technology, innovations and risk management. Furthermore, they are working hard to become part of the economic regional groups, for instance European market countries like Greece, Hungary, the Czech Republic and Poland are working hard to be in the European Union. Mexico is now part of the North American Free Trade Agreement.

In the cases of Zimbabwe, Jordan Venezuela and Nigeria, these individual markets have become more segmented and isolated from the world markets because of various market imperfections such as inadequate and inaccurate information, iliquidity and government interventions. Investing in these markets is risky and the benefits of diversification are minimal.

The predictability of returns using common instruments gives evidence of time varying expected returns. Further, the hypothesis that the conditional mean returns are constant is rejected.

Markets with high capitalizations and high correlations with world markets are affected more by world factors than local factors. This leads to the conclusion that most markets in Asia, Latin America and Europe are integrated with the world economy. However, South Africa, with a high market capitalization showed that it is influenced more by local factor than world factors. It will be necessary to investigate further the behaviour of this market as more data become available. As for the markets, which are segmented, local factors still play an important role in asset pricing.

The χ^2 statistic indicates that only one country with a long observation period, Malaysia; rejects the model using world factors. Two countries with shorter observation periods reject the model. Nevertheless, caution should be taken in accepting these results, as the data period is relatively short.

CHAPTER SEVEN: FUTURE RESEARCH

From these results, we see that some of the emerging markets are still not yet integrated into world markets and more research is required in terms of understanding their unique problems. The fact that some emerging markets are still segmented means that the ICAPM fails to model asset returns behavior in these markets. It will be of interest to start looking at asset behavior at a national level. More research is required to place in context domestic focussed markets with more internationally orientated ones in terms of innovations, risk management and deregulations. In most semi-open economies the financial systems are often highly regulated and rigid so that external financiers or investors are discouraged from putting their assets in such markets. The availability of adequate information is crucial in bringing these markets into line with the rest of the world. Once they become part of the global village, it becomes easier to come up with uniform accounting systems and legal systems, which make it easier to move funds across borders.

Furthermore, timely and orderly information of good quality will assist to eliminate asymmetries that give advantages to insiders and may lead to loss of confidence in the market place. Governments should create environments that will encourage the return of flight capital and attract foreign capital flows. It is important that the consistency and credibility of any reform programs be maintained.

The impact of liberalization on emerging markets

The conclusion that some markets are more integrated with world markets appears to hold for some markets in Latin America, Asia and Europe. It will be worthwhile to find out the degree to which the efficient market hypothesis applies after liberalization. The efficient market hypothesis suggests that as markets become more open to the public, prices should reflect the increased availability of information and be more competitively priced.

APPENDICES

APPENDIX I: Market Capitalization and Listed Domestic Companies

Country	Market Capitalization			Listed Domestic Companies
	Millions of US Dollars			
	1985	1995	1999	1999
Argentina	2,037	37,783	83,887	129
Brazil	42,768	147,636	227,962	478
Chile	2,012	73,860	68,228	285
Czech	-	15,664	11,796	164
Greece	765	17,060	204,213	281
Hungary	-	-	16,317	66
India	14364	127,199	184,604	5,863
Indonesia	117	66,585	64,087	277
Jordan	2,454	4,670	5,827	152
Korea	7,381	181,995	308,534	725
Malaysia	16,229	222,729	145,445	757
Mexico	3815	90,694	154,044	188
Nigeria	2743	2,033	2,940	194
Philippines	669	58,859	48,105	226
Poland	-	4,564	29,577	221
South Africa	-	280,526	262,478	668
Thailand	1,856	141,507	58,365	392
Turkey	-	20,772	112,716	285
Venezuela	1,128	3,655	7,471	87
Zimbabwe	360	2,038	2,514	70
Total	55,930	1,499,829	1,999,110	11,508
World	4,666,880	17,788,071	27,458,957	47,465

Source: 2000 World Development Indicators and Emerging Stock Markets Factbook 1999.

APPENDIX II: Country Profile

A country profile analysis for each country in the sample is done in this section. The major economic, political and social developments, which took place during the period under review (1985-2000), are analyzed.

It is from the background information that we compare our empirical results with the characteristic of each market. There are parallels between the developments in the Latin American markets and the Asian markets but the developments in the Sub-Saharan Africa are different and unique. The transitional economies of Eastern Europe, that is, Poland, Turkey and the Czech Republic also have a different orientation since they are coming from a controlled economic system.

Argentina

The major highlights of Argentina 's economic, political and financial events from 1985 –2000 are: a banking crisis in 1985, economic and financial reforms that included the Austral plan and the Brady plan, rescue packages, liberalization and financial deregulations. The market also suffered the contagion effects of the Brazil and Mexico, Asia and Russia crises.

According to Pou[3], (2000) Argentina experienced serious financial and economic problems in the 1980s. Hyperinflation rose to unprecedented levels of 2600 percent in 1989-90 and this prompted Argentina to make reforms that have set

Argentina on a path to sustained growth. During the 1980s, the economy faced numerous problems when the first debt crisis was in full swing. Growth stagnated, financial markets collapsed, inflation rose substantially, capital fled the market in pursuit of safer havens and external debt was mounting. The government could not balance its budget and it relied on inflationary financing.

The Convertibility Plan of 1991 started the reforms, which included the financial system reforms, liberalization of trade and capital account and public sector reforms. Most of the changes were accelerated in the wake of the Mexican crisis in 1995. Trade restrictions and capital movement were removed and this significantly opened up the economy. In the public sector reform, almost all the major public enterprises were privatized and this resulted in the reduction of subsidies to the enterprises and funds were available to cover the government deficit. The government encouraged the entry of new international firms into the local markets.

For the financial system reform, the Convertibility Law 1991 fixed the exchange rate at one Argentina peso per U.S dollar, eliminated indexing and required the central bank to back two –third of the monetary base with international reserves. The banking system was deregulated with restrictions on the entry of foreign banks and opening of new branches of domestic banks removed. The banking regulations increased competition between banks and ensured safety of individual banks and of the system. Moral hazard was reduced by eliminating deposit insurance and Central Bank Charter curtailed the role of the central bank as the lender of the last resort. The

[3] Pedro Pou is the governor of the Central Bank of Argentina.

banking crises (the Tequila 1995 and Mexico 1994) experienced in the Latin Americas led the authorities to revise their bank regulations significantly.

The banking system also adopted new technologies in its operations by using real time gross settlement system managed by the central bank, an automated large value clearinghouse and two automated low value clearinghouses.

Brazil

In 1885, after twenty years of military rule Brazil returned to civilian rule with a highly unstable political environment. Furthermore, the death of Tonaedo de Almeida Neves, the elected president in 1985 and the impeachment of Fernando Collor de Mello 1992 did not help the situation either as this led to a situation of lack of continuity and cohesion of economic and monetary policy because of changes in the cabinet. The economic situation started improving in 1993 when an economic plan known as the Real plan was implemented. The major objectives of the plan were to reduce inflation and public spending; collecting liabilities owed to the government and increase tax revenues. The Plan also supported a privatization program that started in the early 990s. A new currency called the real was introduced to replace the cruzeiro real.

After the 1997 Asia crises, the Latin Americas also suffered the contagion effect. Brazil's security market indices declined significantly and foreign investment reduced drastically. The government took measures to redress the situation by increasing interest rates, introduced certain taxes and reduced government spending.

The monetary policy was implemented with the aim of preserving macroeconomic consistency of the stabilization program.

Chile

Chile made remarkable growth during the 1990s. This rapid growth is attributable to the consequences of the market oriented structural reforms that began in the mid 1970s and continued in the 1980s and 1990s. There was a low inflation environment made possible by prudent macroeconomic policies. The country also returned to a democratic system of government after 1990. This political change substantially reduced uncertainty about the sustainability of the political and economic games, thus reducing the risk of investment and innovation decisions to both nationals. New democratic governments maintained and further improved economic policies resulting in unprecedented increase in quality and quantity of capital accumulation and growth.

During the 1960s and 1970s, Chile depended on import substitutions and the state was actively involved in running the economy. There were no significant structural reforms during that time. The Country suffered a tendency towards fiscal imbalances and chronic inflation. Chile depended on copper exports, which represented 70 percent of total goods exported despite efforts to diversify the export base, and as a result, the country experienced recurrent balance of payment crises. In the early 1970s, the government attempted to overcome the fundamental deficiencies of the Chilean economy by nationalization and the acceleration of agrarian reforms. This resulted in expansionary fiscal, monetary and wages policies, which together

with generalized price control led to a major economic crisis. From 1973 to 1989, the military government attempted to restore macroeconomic equilibriums were achieved but unemployment and inflation remained high at double digits.

In the second half of the 1970s, and early 1980s major structural reforms oriented towards having a more open, competitive, private sector driven and price deregulated market economy. These reforms included privatization of state owned enterprises, dismantling the protectionist economy, trade liberalization, tax, financial and social security system reforms.

The 1982-83 crisis made it clear that some of the reforms implemented were flawed. In the period1985-89, some of the policies were revised and a new banking law and an independent central bank were established. Since the 1990s, the democratic administrations gave high priority to overall macroeconomic equilibrium and the control of reduced inflation. Most of the structural reforms of the previous 15 years were maintained and improved upon. Trade reform was extended; new capital markets and banking law were promulgated. Education and reform and judiciary systems were deepened, modernized, and made more efficient. Integration with world financial markets also increased.

In the early 1970s, Chile benefited from international copper prices but in the early 1980s, the real price of copper fell. On the financial side, world real interest rates declined significantly in the 1970s and there were significant net financial flows to emerging markets especially Latin America until 1981. At the beginning of the1980s, international interest rates increased significantly and this together with a

significant level of foreign debt led to the debt crisis of the early 1980s. In the early 1990s international interest rates increased, Latin America's structural reforms, improved economic management and lower political country risk explained the abrupt change in the trend and huge net capital inflows increased to the region during the first half of the 1990s. The process came to a halt with the Mexican crisis of December 1994. Latin America suffered reduced foreign financing during the second half of the 1990s due to the impact of the Asian crisis on the region.

Czech Republic

The transition reforms started in1993 on a sound footing with restrictive monetary and fiscal policies. Inflation and external debt were put under control. Because of this stable macroeconomic environment, conditions were created to implement the changes. The early success of the macroeconomic stabilization program reflected the inherent strength of the Czech economy.

The government virtually lifted all restrictions on foreign trade and the currency became convertible by 1995. Legislative reforms enabled free entry into nearly all business activities resulting in efficient allocation of capital and labour. The financial sector was restructured with government assistance with the aim to reach the levels of western economies. In the industrial sector, there have been dramatic increases in direct foreign investment with substantial improvements in technology, quality of firm management and marketing. Trade has improved with outward looking orientation. Trade with the European Union increased from 37 percent in 1989 to 63 percent in 1995. Czech's aim is to be integrated with the EU.

The country's credit rating also improved thereby increasing investor confidence. However, poor corporate governance has affected the performance of the economy negatively. The weakness of corporate governance has its roots in massive privatization schemes implemented in the first half of the decade. Lack of strong capital market regulations and the delay in privatization of commercial banks upset the market reforms. From 1998, the government made a concerted effort to improve market regulations and corporate governance. These efforts are reflected in the creation of an independent securities exchange commission and reforms in the legislative system governing the operation of the exchange.

Greece

Lack of fiscal control and high level of spending during the 1980s pushed inflation above 20 percent. The economy has improved over the years and the government has tightened monetary policy and privatized some leading state enterprises with the goal of qualifying Greece to join the European Union.

Greece embarked on the Convergence Program 1994-1999 and during this period, government deficit went down, interest rates were substantially decreased. There is also a high degree of political stability after the reelection of Panhellenic Socialist Movement in April 2000. The government continues to implement market oriented reforms and privatization. The country places special emphasis on economic diplomacy as a means for strengthening economic and cultural ties and understanding between itself and its neighbors.

India

The economy is a mixture of traditional village farming and modern agricultural, modern, industries and support services. India's growing population is overloading the environment. Further, financial strains in 1990 and 1991 prompted the government to introduce austerity measures that slowed industrial growth but permitted India to meet its international obligations without rescheduling debt.

In 1991, Rao's government embarked on a structural adjustment program focusing on the supply side. The reforms targeted improvements in the financial sector, trade and industrial policies, and taxation and public sector initiative. The objective of this was to enhance favorable conditions for investment and employment.

The key reform initiatives included:

Encouragement of foreign debt investment, red tape was greatly reduced and portfolio investment was encouraged,

- Most industries were de-licensed to encourage competition,
- Deregulation on aspects of business decision making and
- Liberalization of trade policy and capital markets.

The World Bank Economic Review points out that ' Positive factors for the remainder of the 1990s are India's strong entrepreneurial class and the government's recognition of the continuing need for market oriented approaches to economic development, for example upgrading the wholly inadequate communications facilities.'

However, The Times of India (December 2 1999) points out that India is one of the six 'mostly unfree' economies of the world with a complex regulatory

framework and a slow judiciary system. Furthermore, the 2000 index of economic freedom describes India as an expensive, complicated and frustrating environment in which to do business

Indonesia

From the 1950s to the early 1980s, the Indonesian government frequently resorted to controls on bank lending and special credit programs at subsidized rates to promote favored groups. This led to crony capitalism, corruption and inefficiencies. Like, Korea and Thailand the Indonesian economy had weaknesses in the financial system stemming from inadequate regulation and supervision, and heavy governmental role in credit allocation. This resulted in misallocation of credit, inflated asset pricing and large unhedged private short-term foreign debt where corporations were highly geared. Economic and financial data were inadequate for making informed decisions.

Since 1980, the Indonesian government enacted a number of economic reforms designed to boost both domestic and foreign investment and to stimulate non-oil export. Sweeping reforms introduced in the early 1980s transformed Indonesia' government controlled financial sector into a competitive source of credit at market determined rates. Most of the reforms reflected a new orientation to market led economic development. The private banks and the stock exchange played crucial roles in the growing economy. Deregulation of the financial system enabled banks to be competitive and introduce new products. In 1983, banks were permitted to offer market determined interest rates on deposits. By 1988, further deregulations

eliminated restrictions on banking competition and foreign players were allowed. The extensive bank deregulation promoted rapid growth in rupiah dominated bank deposits. The stock exchange was revived and many restrictions were lifted. Trade reforms introduced in the Mid 1990s were very successful in promoting growth of new export industries. Indonesia.

Prior to the 1997 crisis, there was rapid growth in the economy, this was followed by deceleration of export growth, and the quality of assets portfolio deteriorated. The underlying weakness in the financial sector became increasingly evident, raising concern among foreign investors about the financial institutions.

After the 1997-98 crisis the Indonesian economy recovered substantially, with output growing steadily due to increase in both export and domestic investment. Inflation has been kept low and the rupiah is much more stable and short-term interest rates are under control.

Jordan

During the period in question, the market underwent substantial liberalization including the withdrawal of restrictions on foreign investors trading in listed stocks. The aims of the liberalization were to remove market distortions, balancing economic growth through monetary stability, maintaining a fixed exchange rate for the Jordanian Dinar, and providing greater incentive to the private sector for broader participation in the economy.

Great strides have been made in opening the economy through regional free trade agreements and creating the conditions necessary for accelerating technology transfer and expertise. Generally, Jordan's economy has been performing well above the regional group with the highest gross domestic product growth rate over the period 1991-1996. Between 1985-1995, Jordan made dramatic progress in boosting its export and reducing imports.

In 1989, Jordan signed a five-year structural adjustment program with the international monetary fund with the following goals:

- Restoring sustainable growth
- Curbing inflation
- Stabilizing the exchange rate and
- Reducing internal and external financial imbalance

The first phase resulted in positive turnaround in the country's economic performance. Unfortunately, the progress was interrupted by the Gulf Crisis (1990-1991). Thereafter a 1993-97 economic and social development plan was drafted as a tool for development. Jordan also made remarkable reforms in the regulatory and legislative areas, and this resulted in increase in domestic and international investments. The legislative package has enabled business to operate in a more efficient and transparent environment. Furthermore, the Investment Promotion Law passed in 1995 provided both domestic and foreign investors with additional incentives and exemptions. Jordan also modernized its stock exchanges and opened them to foreign investors.

Korea

Korea experienced substantial macroeconomic imbalances in the late 1970s and early 1980s. The macroeconomic imbalances took the form of an acceleration of inflation, a slowdown in export growth, a large increase in the current account deficit, an increase in foreign debt and a reduction in the growth of output. In the early 1980s, Korea has been successful in at stabilizing its economy and pursuing a gradual structural adjustment program with minimal inflationary and recessionary consequences. This was achieved by adopting monetary, fiscal, and exchange rate policies that were oriented towards the promotion of ambitious investment programs in the heavy and chemical industries. Further, import restrictions, credit rationing and price controls were utilized to support the industrialization effort.

Korea has a well-advanced economy as compared with other Asian countries in this sample. The driving force behind this has been the planned development of an export-oriented economy in a vigorously entrepreneurial society. During the period 1986-1991 Gross Domestic Product increased by 10 percent annually. This growth led to an overheated situation with tight labour, high inflation and a rapid rising current account deficit. The rapid economic growth of the 1980s slowed down at the end of the decade. The inflation rate increased and wages soared higher. In order to control inflation a conservative monetary and a tight fiscal policy were adopted. The country also implemented its five-year plans. During the period under review, the sixth and seventh five-year plans were implemented. The sixth five-year plan encouraged diversification of sources and types of corporate finance, hence attracting foreign investors. The financial sector underwent significant expansion of products

and services and structural changes brought about by liberalization policies. Further, deregulation increased competition in the financial markets. From 1992, economic policy focused on reducing inflation and the current account deficit. However, the financial system had been weakened by government intervention in the economy and close linkages between banks and conglomerates.

Malaysia

The government under took a stringent structural adjustment program in 1983 to reduce the fiscal and balance of payment deficits and to control growth of external debt. From the early 1980s to mid 1990s, the country experienced a period of broad diversification and sustained rapid growth. Foreign and domestic investment played a significant role in the transformation of Malaysia's economy.

The Malaysian economy is a mixture of private enterprise and a soundly managed public sector. Traditionally, Malaysia has maintained a strong fiscal policy over many years, prudent management of the country's external exposure and a good supervisory and regulatory framework for the financial sector. During the period 1988 –1994 the manufacturing sector expanded rapidly and foreign investors committed large sums of money to the economy. Malaysia experienced a decade of strong economic growth up to 1996. In 1997, the country was hard hit by the regional financial and economic crisis. In July 1998, the government introduced a comprehensive series of objectives for promoting economic recovery. Measures were taken to protect the domestic economy from the effects of short-term speculative

capital flows. To encourage investments, foreign direct investment flows, dividends interest and rental income were exempted from the controls.

Mexico

In 1983, Mexico was facing a stagnant economy, severe macroeconomic instability, high inflation rates and an increase in public sector debt because of imbalances caused by public sector policies, an increase in international interest rates and the collapse of the oil prices in the early 1980s. Another type of imbalance was structural inefficiency caused by an oversized public sector that owned too many state enterprises and over regulated the economy. Mexico also had protectionist trade policies that discouraged foreign competition and reduced industrial competitiveness.

To solve these problems, Mexico embarked on a program of fiscal consolidation, deregulation, and privatization in the mid 1980s. The country took serious steps to implement financial reforms, renegotiated its external debt and made a serious effort to open up trade links as evidenced by the signing of the North American Free Trade Agreement. These policies led to economic recovery after a decade of low growth and high inflation. The rate of inflation fell from almost 200 percent in 1987 to 18 percent in 1991. Privatization played an important role in transforming the economy. The privatization policy had sound objectives[4] that were implemented well, thereby, achieving better economic conditions in the country. Deregulation also played an important role in the economic strategy. Rules that

[4] According to Barnes, (1994 p 242) the main objectives were: to increase aggregate economic efficiency and productivity; to promote private investment and technological change; to reduce pressure on the public debt; and to make available public resources to increase infrastructure and social investments.

promoted business and entrepreneurial activity were implemented. With these remarkable developments, unprecedented amounts of capital flowed into the country. These capital flows helped widen Mexico's external debt current account deficit and investors began to question its sustainability. Furthermore, the Mexican economy became more vulnerable to because of this and other factors such as rapid growth of bank credit to the private sector, maintenance of an exchange rate peg, rising international interest rates, political events and criminal acts that generated considerable uncertainty. Mexico received considerable capital inflows in the years leading to the crisis of 1994-95. This capital was attracted by favorable outlook for the economy after years of macroeconomic stabilization and intensive structural reform. In the early 1980s, the country embarked on a program of fiscal consolidation, deregulation and privatization. It also undertook major financial reforms and renegotiated external debt.

Gurria (2000) summarized the reforms, which took place in Mexico as follows:

> The reforms Mexico has implemented, which have focused on economic and financial liberalization, have enabled the economy to take advantage of the benefits of globalization while minimizing the risks inherent in this process. The reforms—which have included trade and capital account liberalization, increased private sector participation in key sectors of the economy, tax reforms, changes in labor market structure, capital market liberalization, and pension system reforms—have transformed a closed, heavily regulated economy with high government intervention into an open, market-driven economy.

The government has reduced its participation in the economy and market forces are now at play.

Nigeria

According to an IMF report, Nigeria has enormous economic potential. It has a vibrant private sector, highly motivated entrepreneurs, vast agricultural land and a large domestic market. It has vast natural resources of oil and is the seventh largest oil exporter in the world. Regardless of all the economic potential, the country remains poor with per capita income of US$240 in 1997 Mismanagement of resources, over regulation of the economy and price and exchange rate distortions are cited as the root of Nigeria's economic problems. Nigeria's economy is state controlled with government spending high and unproductive. Economic activity is hampered by poor performance of the large public enterprise sector. Furthermore, poor governance and abuse of public resources have severe impact on the potential of the private sector which would enable Nigeria reduce its present heavy dependency on petroleum for foreign exchange government revenue and economic growth. Inflation rose from six percent in March 1998 to about 15 percent in December 1998.

In recent years, efforts were made to stabilize the economy by introducing greater competition and strengthening the financial system. The democratically elected government that took office in May 1999 adopted policies to restore macroeconomic stability, liberalize the exchange rate regime, and combat corruption. Inflation was reduced from 77 percent to about 10 percent over a period of four years following tighter monetary policy. Exchange controls on current international transactions have been almost eliminated, interests have been deregulated and restrictions on competitions and private sector participation have been removed. A

number of measures have been taken to address financial sector distress, including raised paid up capital requirements, liquidating insolvent banks, improving loan recovery and imposing sanctions for financial malpractice.

The IMF report (Policies For Faster Growth And Poverty Reduction In Sub-Saharan Africa And The Role IMF December 2000 Box 3) notes that:

'Nigeria's economic situation to improve rapidly, strict financial discipline will need to be supported by market-based reforms and debt relief. Priorities in the structural area include privatization, the reduction and rationalization of the tariff structure, and a strengthening of essential infrastructure. Without these measures, returns on capital would remain insufficient to finance needed increases in investment, and the external current account deficit would persist at a high level. And external current account deficits might prove unsustainable, unless debt relief can be obtained on more generous terms.'

Philippines

The market is characterized by a period of slow growth and imbalances in the late 1980s and it came out of the woods in the early 1990s. In the 1980s, the economic situation deteriorated sharply due to policy mistakes, external shocks, and natural disasters and political instability. Easy credit encouraged excessive borrowing by private firms and protectionist industrial and trade policies undermined competitiveness. Serious governance problems characterized by crony capitalism aggravated the problems. A change of government in 1986 to a democratic system brought political stability. The new government was outward looking and brought market-oriented reforms. The Philippines government through the National Economic and Development Authority implemented market-oriented monetary policies and liberal trade policy, based on a comparative advantage. Domestic and

international investors responded to the reforms in the late 1980s. However, the economy was affected by natural disasters in the early 1990s, for instance, the prolonged drought which forced Philippine to import rice, a major earthquake which caused severe destructions and a typhoon which did considerable damage.

The 1990s witnessed impressive economic progress in the Philippines, reflecting sound economic policies. By 1996 growth had accelerated to about six percent, inflation was down to five percent and the external position strengthened with rapid export growth and increasing foreign currency reserves. Successive governments maintained the democratic system, enhanced the reforms by reducing macroeconomic imbalances, and eased other rigidities. Since then, investor confidence has been maintained and sustained.

Poland

Poland took a bold step after breaking away from the Soviet dominated communist block to transform its inefficient central planned economy into a market economy. In 1990, the government introduced the Transformation Program that was designed to stabilize the economy, promote structural reforms, and put the country to an open market economy.

During 1992-1994, the country experienced moderate recovery and this was followed by robust growth, during 1995-1999 driven by rapid expansion of the new private sector. As a result, the country has not been affected by the financial crisis which hit Russia in 1998 and Czech in 1997. This resilience is attributed to its

balanced and consistent macroeconomic policy, structural reforms and relatively strong and transparent financial system. Poland made good progress in a difficult transition to market economy by decontrolling prices, removing subsidies and drastically reduced import barriers. There was slow growth in privatization in the early years of the transition but it picked up in 1995 when 512 small state enterprises were transferred to private National Investment Fund under the Mass Privatization Program. Inflation, which had almost reached 1200 percent in 1990, was drastically reduced to 21.6 percent by December 1995.

South Africa

Prior to the period under survey, South Africa suffered a severe recession (1988-1992) caused by drought, political uncertainty, and sluggish international economy and depressed world commodity prices. The lifting of sanctions by the USA and other countries in 1991 helped South Africa pullout of the recession. In general, South Africa applies the regulations to domestic and foreign.

It is the biggest capitalized market in Africa with a total capitalization of US $248 billion (1996). This figure represents 90% of the capitalization of African stock markets. The economy is domestic consumption oriented and for the economy to continue booming the economic orientation needs to change from domestic to export orientation.

South Africa followed a market-oriented approach to economic development since its independence in 1994. The country pursued sound fiscal and monetary

policies and substantial progress was made in trade liberalization. Above all South Africa has managed to maintain a healthy and robust financial system. This approach has helped South Africa to withstand the contagion effect of the financial crises (1997-1998) in Asia and Russia. However, the political and economic crisis in Zimbabwe appeared to have adversely affected business confidence and real growth in 19999- 2000.

Following a sound monetary policy, inflation has fallen considerably during the 1990s, from 18 percent in 1991 to 8 percent in 1999. South Africa has a promising economy and progress made so far needs to be maintained. Structural reforms are required in the privatization area, as it will encourage both domestic and foreign investment that is necessary for economic growth. It is envisaged that a robust growth in South Africa would be catalytic in the development of the economies of the whole region. Private investment in sub-Saharan Africa remains below most of the emerging markets in other regions. Lack of investment is attributed to the perception and expectation by both domestic and foreign investors of high risk and low returns on capital. The South African economy depends heavily on the mining sector and falling international gold prices and other industrial commodity prices have dampened the market sentiments.

Thailand

Thailand boasts of one of the most diverse economies in South East Asia. The economy transformed from an import substitute based manufacturing to a manufacturing base targeted at export to high technology, manufacturing of

computers and automobile parts. The 1997Asian crisis underscored the need for further reforms especially in the finance sector. The government has a history of corruption, military dictatorship and weak coalitions. The legal system also hinders economic recovery and effective integration of the Thai economy into world markets. Many of the rules and regulations were set up in the 1930 –1940 period and obsolete to deal with economic and business issues presently facing the country. Although the government embarked on privatization, of its public entities, the major impediment in the whole exercise is the powerful political interests.

Turkey

Turkey suffered from chronic high inflation during the 1980s and 1990s.Programs designed to curb inflation were never carried out successfully. Inflation imposed a heavy burden on the economy and society, worsening inequality incomes and distorting the planning horizon of investors and savers. As a result, the economy operated under constant threat of instability and discouraged foreign and domestic investment.

Venezuela

Millet Mathew (1998) points out that in the early 1990s political instability, because of two failed coups and the impeachment of president Perez undermined economic recovery. The country's largest bank collapsed in late 1993 triggering a severe financial crisis. Foreign exchange markets were closed and the government began rationing foreign exchange to the private sector. The country defaulted on its

foreign currency debt due to lack of administrative procedures of converting the Bolivar's, Venezuela's national currency.

The country is known for its democracy. In 1996, the government introduced a social reform program dubbed Agenda Venezuela. In this reform package, prices and exchange controls were eliminated, interest rates were deregulated, a more restrictive monetary policy was reinforced, increased taxes were introduced, and privatization of state owned enterprises and financial institutions was encouraged.

The economy depends on the oil industry and as a result the instability of world oil markets easily affect the economy. The government elected in 1994 used interventionist policies to managing the economy. It introduced price and exchange controls to curb inflation and to stop the loss of foreign exchange reserves. However, these restrictive economic policies and political uncertainty deterred foreign and domestic investment. In 1996, the government introduced measures to undo the effects of the interventionist policies adopted n 1994. Structural reforms were also introduced with the aim of reducing the dependency of the economy on the oil sector but the government has failed to reduce the high public sector spending to date.

Zimbabwe

Zimbabwe embarked on a promising economic reform program in 1991 but the momentum was marred by the pressure on the currency in late 1997, abrupt increase in war veterans benefits and uncertainty on the land reform. The situation was further worsened by external environment, weaknesses in parastatal finances and

the ripple effect on the financial system of a bank failure. Investor confidence was eroded by the imposition of price control on basic commodities, especially the staple maize meal, continuing uncertainties about the direction of land reform and the government's intervention in the Democratic Republic of Congo from 1998 to current. Moreover, political instability and the policy shift which saw unsustainable public spending commitments and output disruption associated with the fast track land redistribution further affected the country credit rating.

Research has shown that investors perceive risk to be higher in Sub-Saharan Africa than any other region. Investors also face greater impediments in identifying and exploiting profitable opportunities in this region. Sub Sahara received very modest amount of foreign direct investment in the 1990s and returns have been higher than other developing regions. Rate of return averaged 24-30 percent compared with 16-18 percent for all developing countries. Investors choose countries with stable political and economic environments. They also consider open market, minimal regulations, good infrastructure facilities and low production costs. Bringing these factors together have proved difficulty for many Sub-Saharan Africa. The major risks identified are civil strife and macroeconomic instability such as large structural fiscal deficit, erratic monetary and exchange rate policies, weak financial systems which have contributed to high and variable inflation and interest rates and high volatility in real exchange rates.

In most Sub-Saharan Africa, there is slow economic growth and small domestic markets. These limited size of domestic markets have deterred broader based foreign direct investment. Foreign investors are often subjected to excessive

and discriminatory regulations. In Zimbabwe, there were restrictions limiting foreign investors on the purchase of issued capital until 1995 when foreign investors were allowed to remit 100 percent of their after tax profits. Individual investors could purchase up to five percent of issued capital and institutional foreign investors could purchase up to 25 percent. There is slow progress on privatization. The government is still controlling strategic entities and there is powerful political influence, which deters private investments.

Creditworthiness remains low due to high political risk, weak growth and export performance, macroeconomic instability and high level of indebtedness.

The financial market is not well developed. There are limited products in this market, for instance, there are no futures, forward and option markets. However, synthetic forwards are available up to six months. The country has the lowest capitalization of all the markets in the sample.

Appendix III Equity Mean Returns and Standard deviations in ascending order

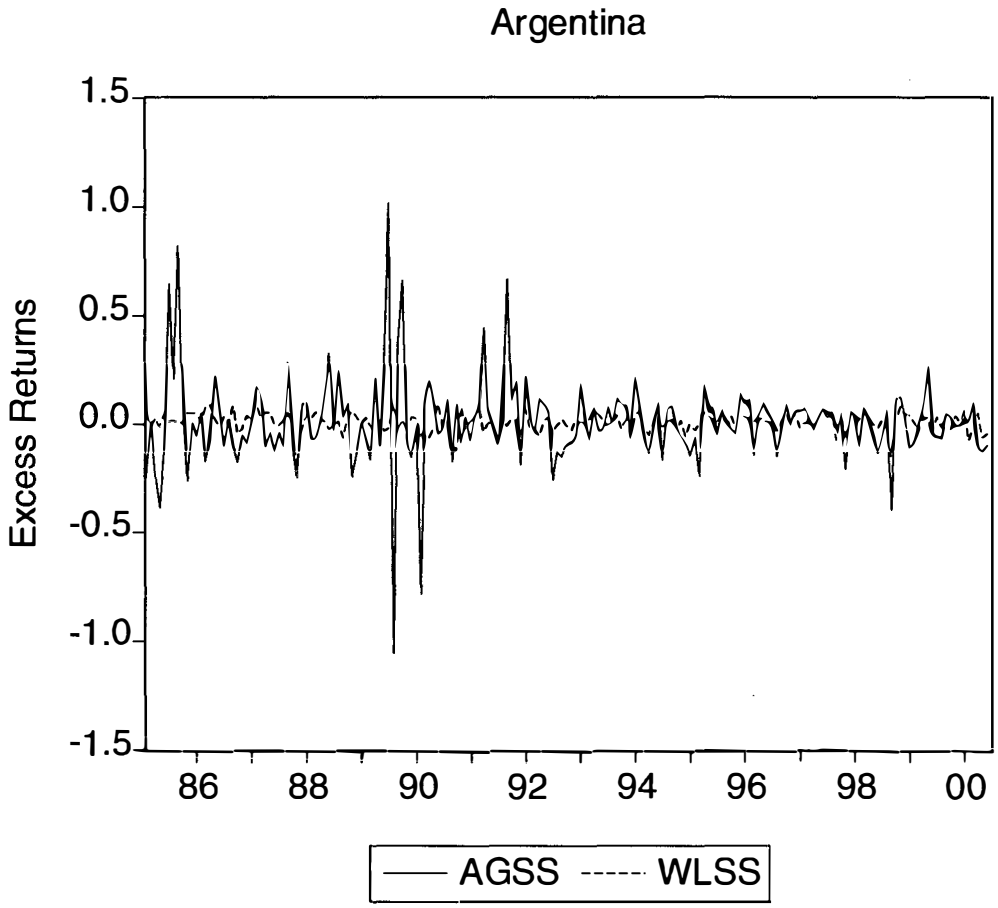
Country	Mean	Country	Standard deviation
Indonesia	-0.0137	World	0.0424
Czech Republic	-0.0120	USA	0.0441
Poland	-0.0062	Jordan	0.0446
South Africa	-0.0021	EAFE	0.0511
Nigeria	-0.0011	Japan	0.0725
Malaysia	-0.0003	Chile	0.0790
Jordan	0.0005	South Africa	0.0880
Turkey	0.0005	India	0.0925
Thailand	0.0010	Czech Republic	0.0926
Venezuela	0.0035	Thailand	0.1025
Japan	0.0038	Malaysia	0.1036
Korea	0.0038	Greece	0.1082
India	0.0040	Zimbabwe	0.1084
Hungary	0.0045	Philippines	0.1086
Brazil	0.0059	Korea	0.1141
EAFE	0.0072	Hungary	0.1201
World	0.0079	Turkey	0.1208
Zimbabwe	0.0080	Mexico	0.1367
USA	0.0095	Poland	0.1408
Philippines	0.0102	Venezuela	0.1447
Argentina	0.0127	Indonesia	0.1490
Greece	0.0132	Nigeria	0.1521
Mexico	0.0137	Brazil	0.1798
Chile	0.0175	Argentina	0.2038

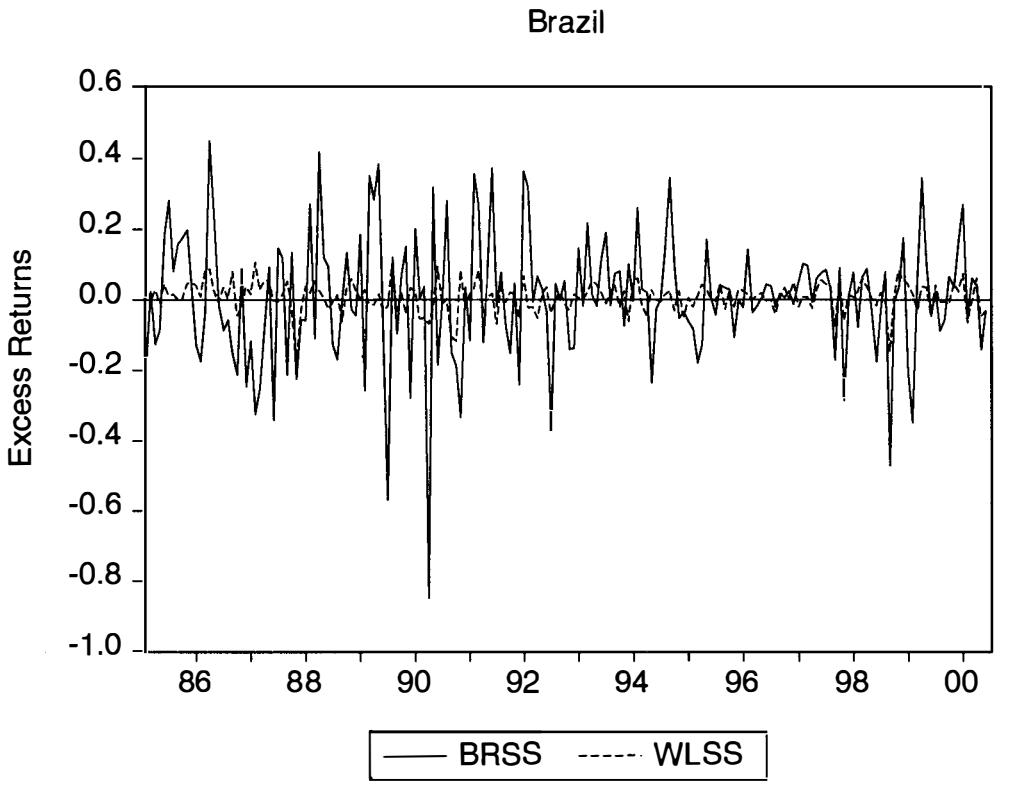
Dividend Yield Mean and Standard deviations in ascending order

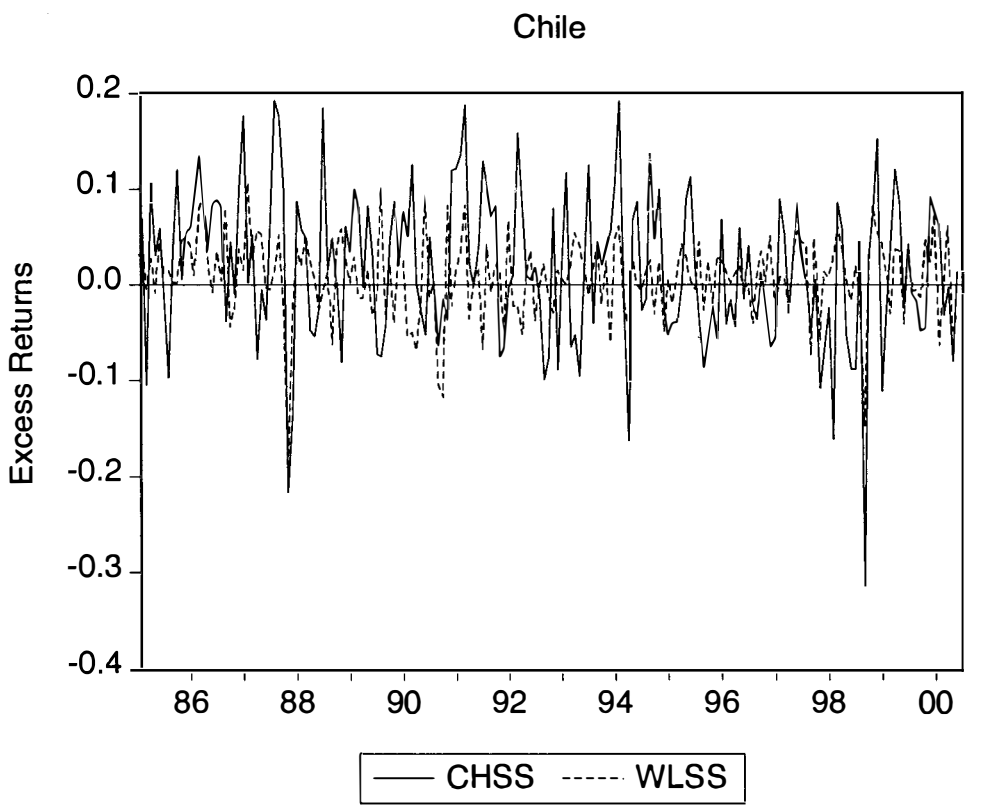
Country	Mean	Country	Standard Deviation
Indonesia	0.0010	South Africa	0.0003
Poland	0.0010	Poland	0.0005
Philippines	0.0012	Indonesia	0.00056
Hungary	0.0013	Czech Republic	0.00060
India	0.0015	India	0.00062
Korea	0.0016	Malaysia	0.00063
Czech Republic	0.0016	Hungary	0.00064
Malaysia	0.0017	World	0.0007
Venezuela	0.0018	Philippines	0.00115
Mexico	0.0020	Korea	0.00119
South Africa	0.0021	Argentina	0.00127
World	0.0023	Mexico	0.00128
Jordan	0.0028	Venezuela	0.0014
Brazil	0.0029	Jordan	0.0016
Thailand	0.0030	Turkey	0.0018
Turkey	0.0034	Chile	0.0019
Chile	0.0041	Nigeria	0.0019
Greece	0.0042	Thailand	0.0022
Nigeria	0.0058	Brazil	0.0026
Argentina	0.0103	Greece	0.0027
Zimbabwe	0.0544	Zimbabwe	0.0264

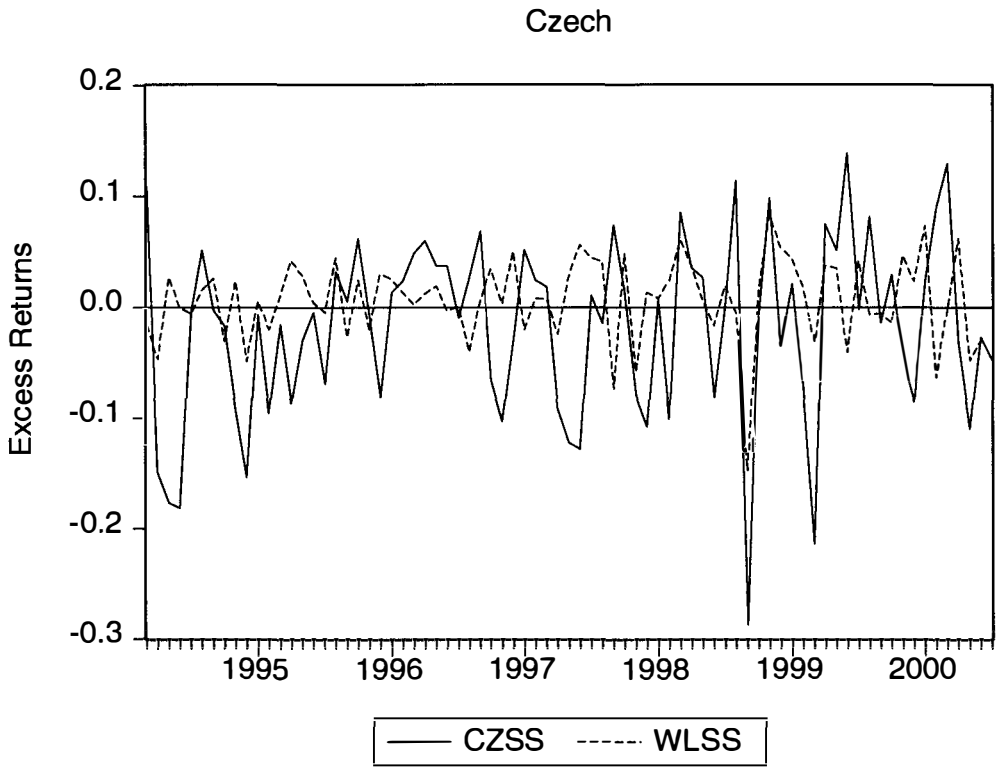
APPENDIX IV: Correlations between the World Excess Returns and Country Specific Excess Returns 1985:2-2000:6

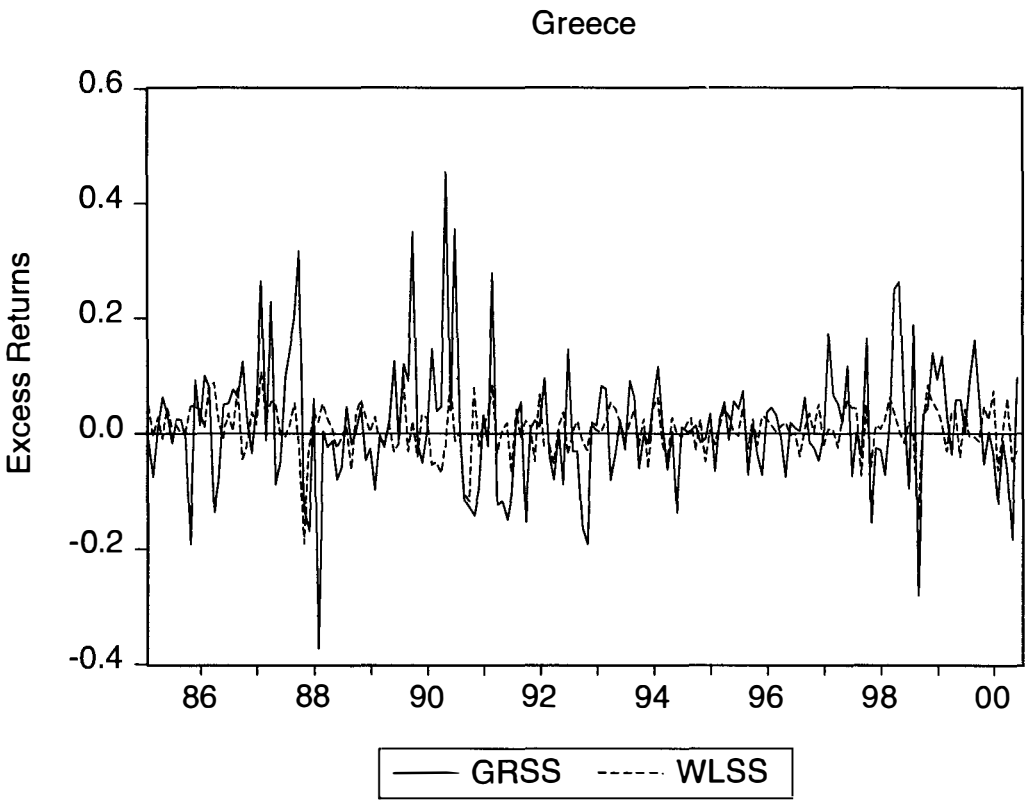
Czech, Hungary, Indonesia, Poland, South Africa and Turkey have plots from 1994:02- 2000:6

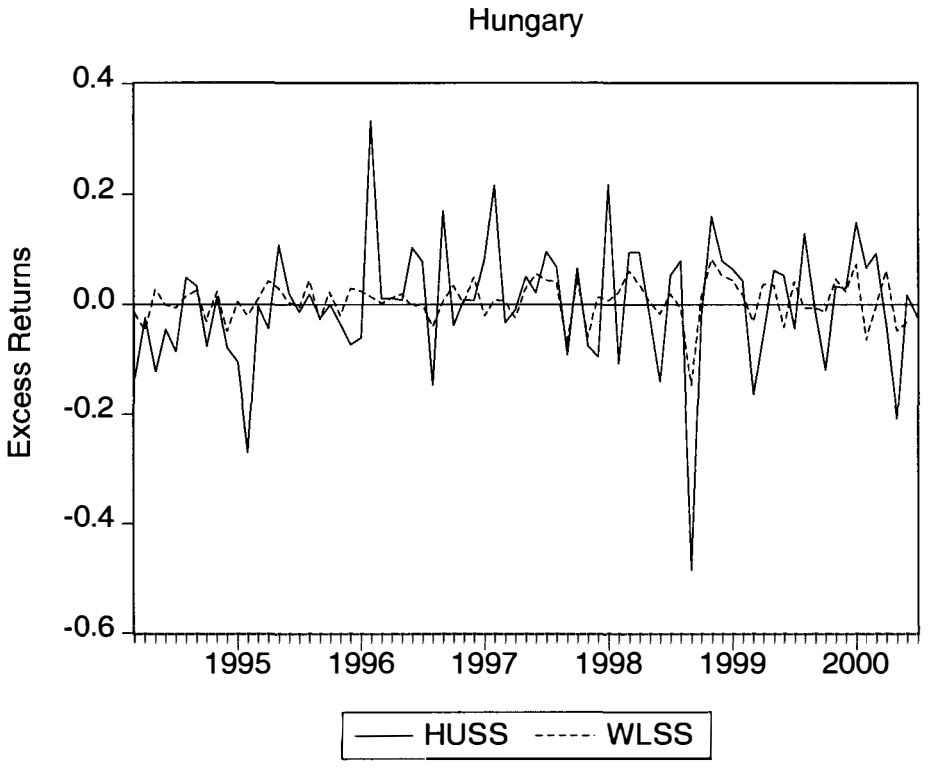


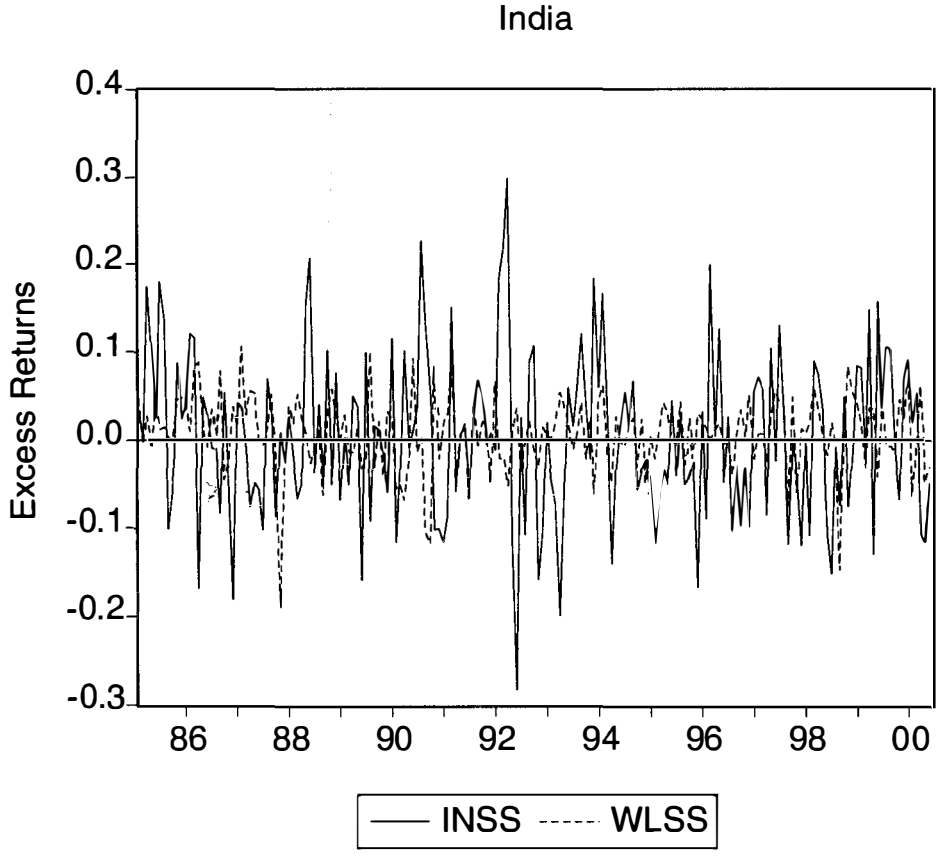

Brazil
Excess Returns
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
86
88
90
92
94
96
98
00
BRSS
WLSS

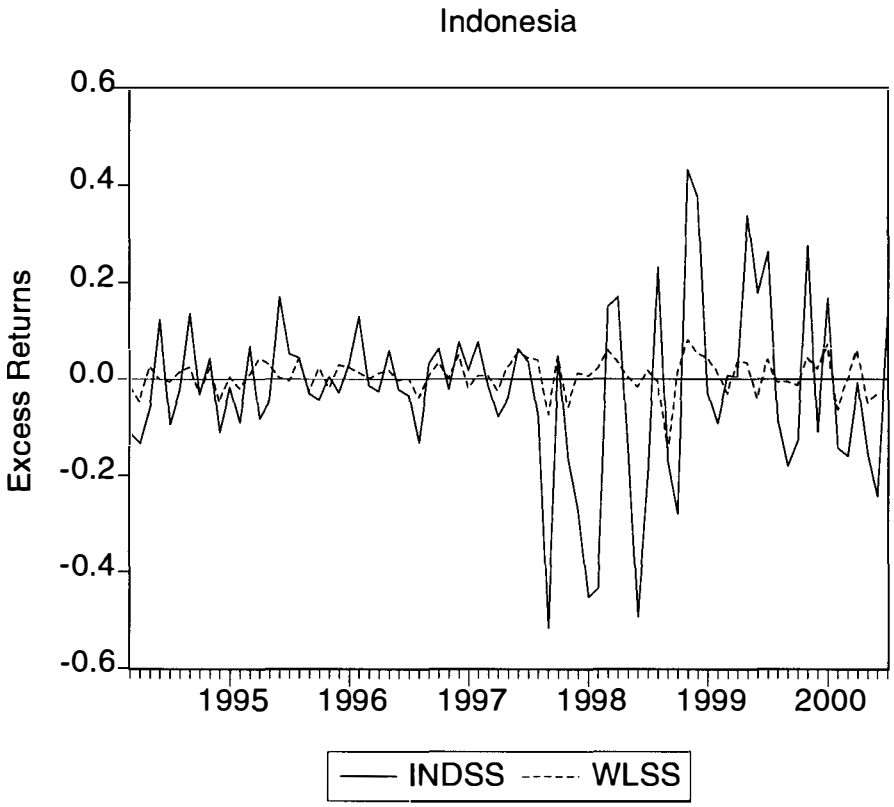

Chile
Excess Returns
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
86
88
90
92
94
96
98
00
CHSS
WLSS

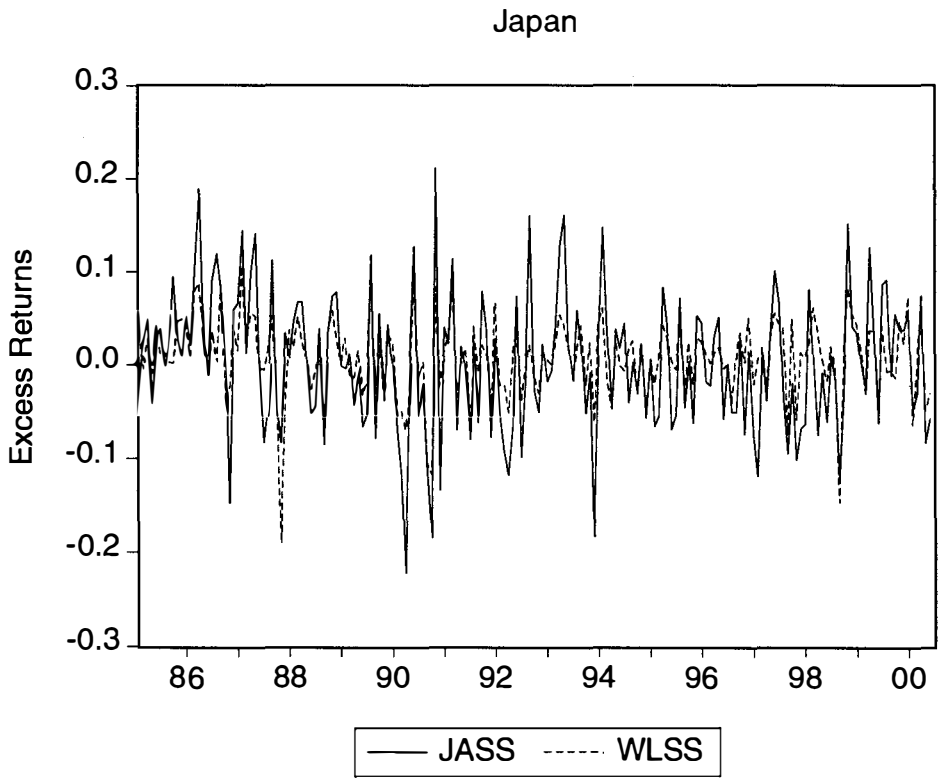

Czech
0.2
0.1
0.0
-0.1
-0.2
-0.3
Excess Returns
1995
1996
1997
1998
1999
2000
CZSS
WLSS

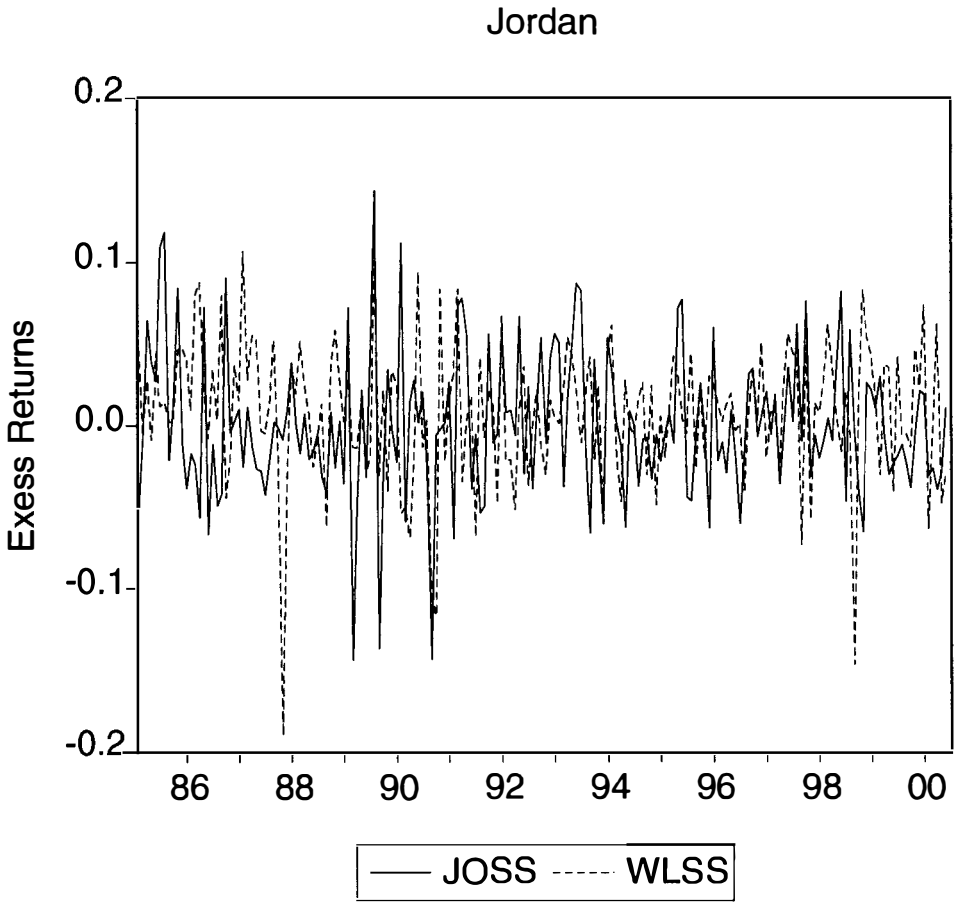

Greece
Excess Returns
0.6
0.4
0.2
0.0
-0.2
-0.4
86
88
90
92
94
96
98
00
GRSS
WLSS

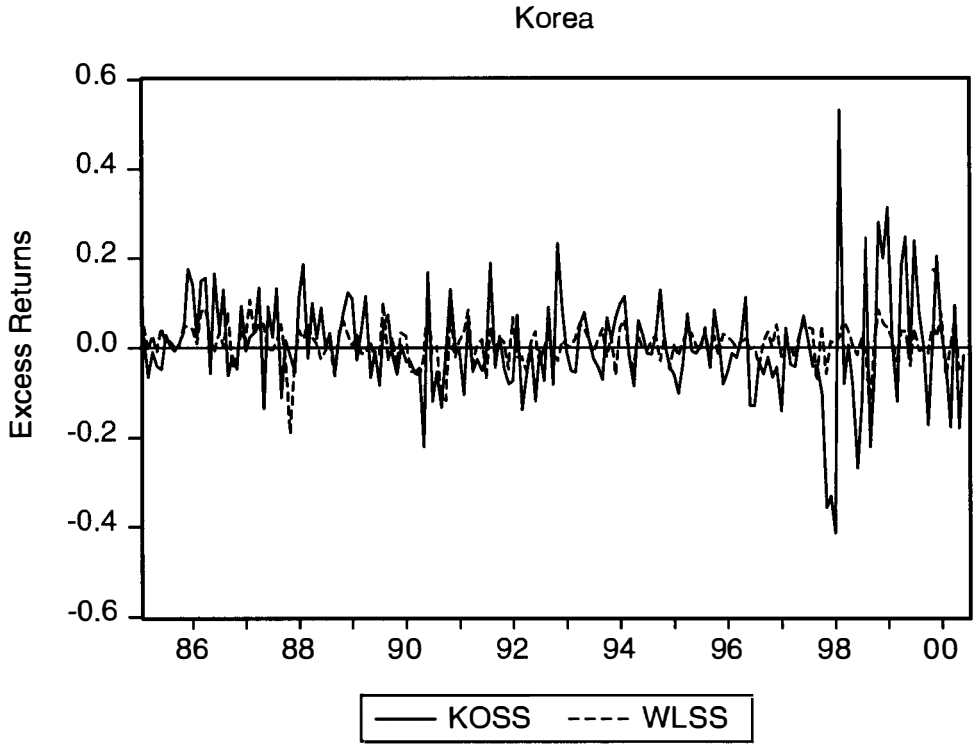

Hungary
Excess Returns
0.4
0.2
0.0
-0.2
-0.4
-0.6
1995
1996
1997
1998
1999
2000
HUSS
WLSS


India
Excess Returns
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
86
88
90
92
94
96
98
00
INSS
WLSS

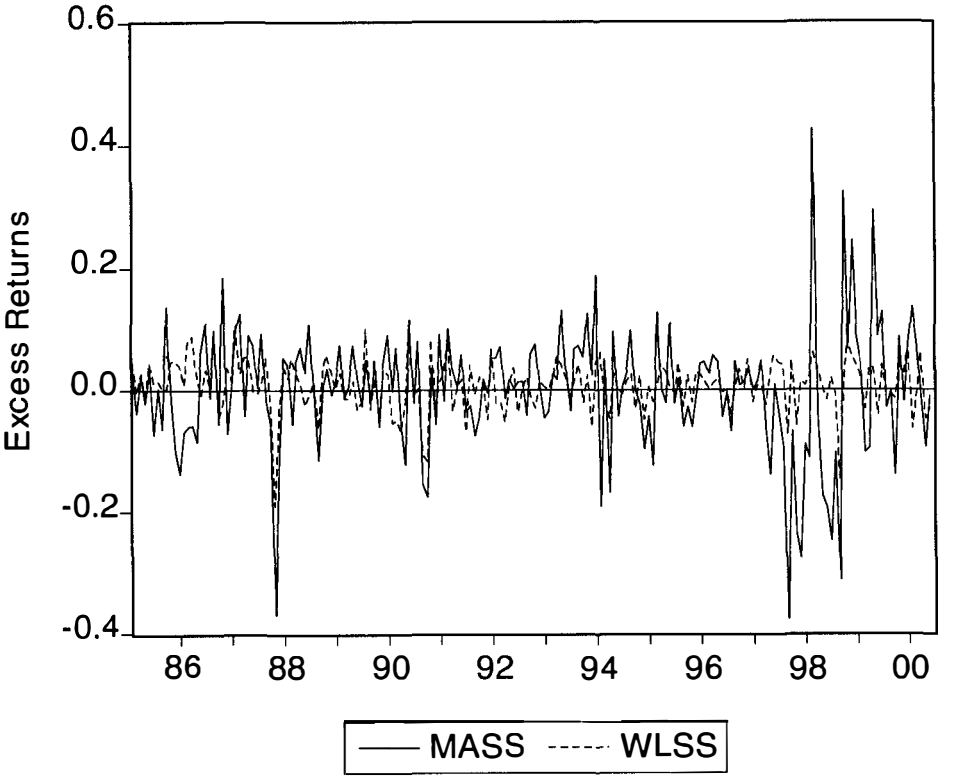

Indonesia
Excess Returns
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
1995
1996
1997
1998
1999
2000
INDSS
WLSS


Japan
Excess Returns
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
86
88
90
92
94
96
98
00
JASS
WLSS

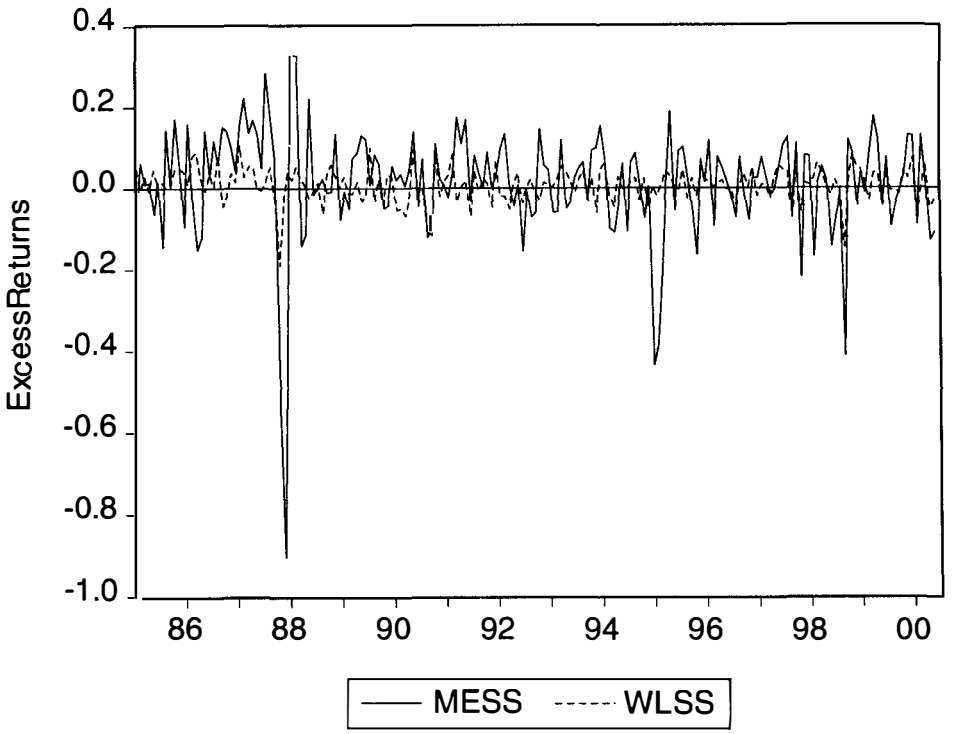

Jordan
Exess Returns
0.2
0.1
0.0
-0.1
-0.2
86
88
90
92
94
96
98
00
JOSS
WLSS

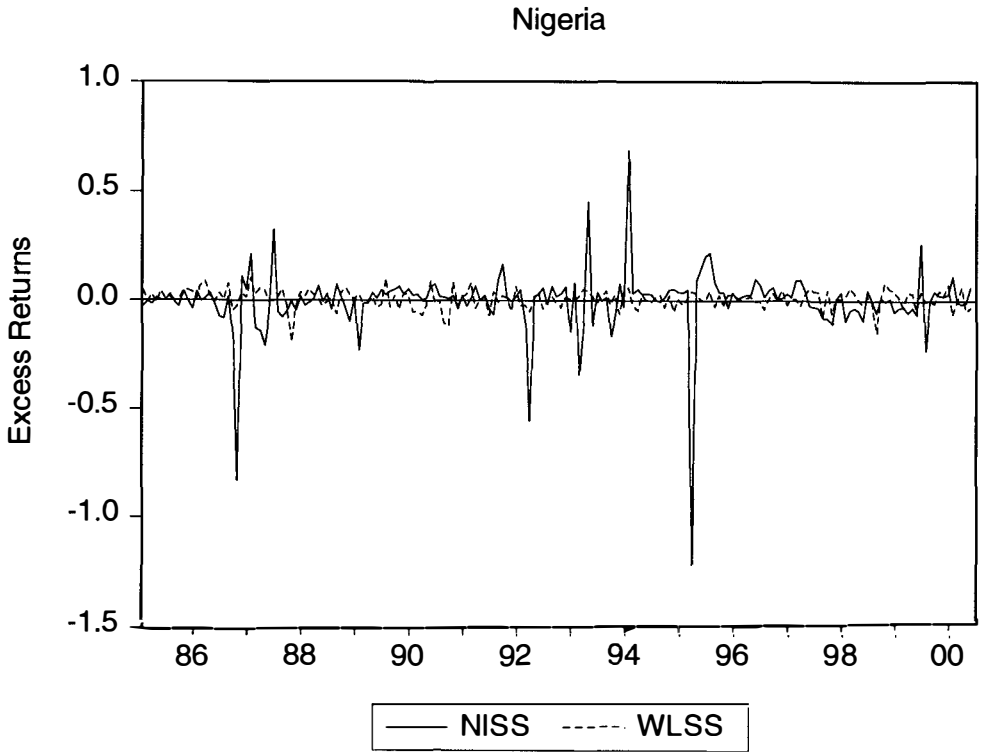

Korea
Excess Returns
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
86
88
90
92
94
96
98
00
KOSS
WLSS

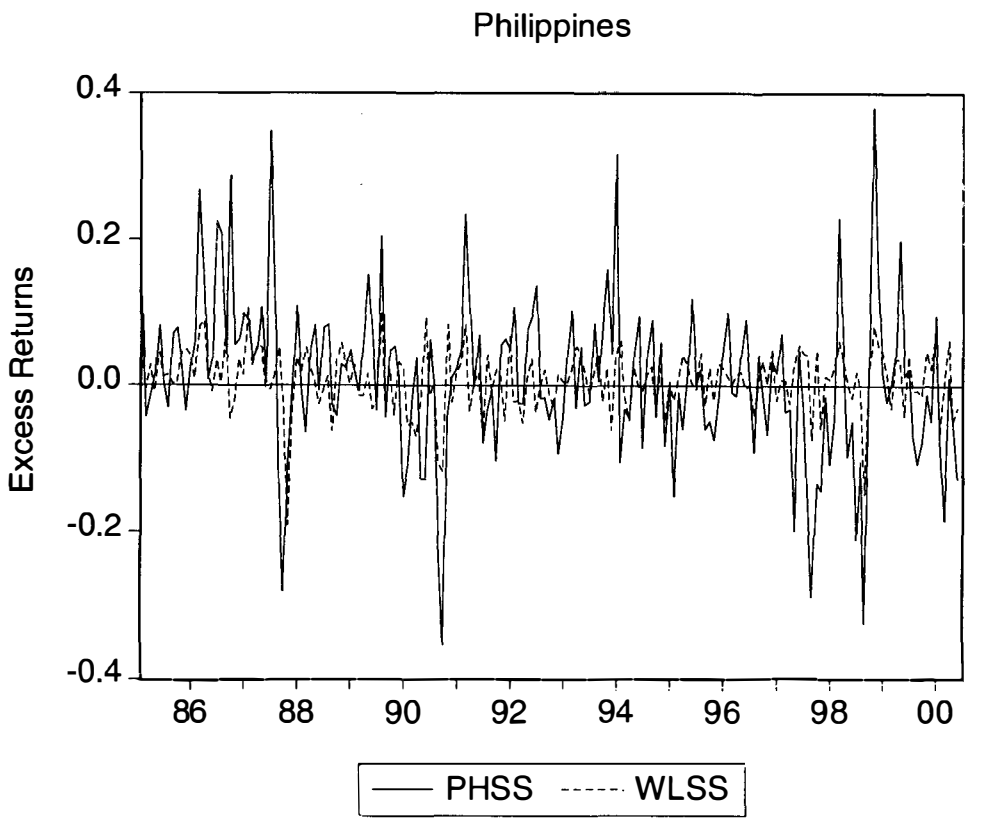
Malaysia

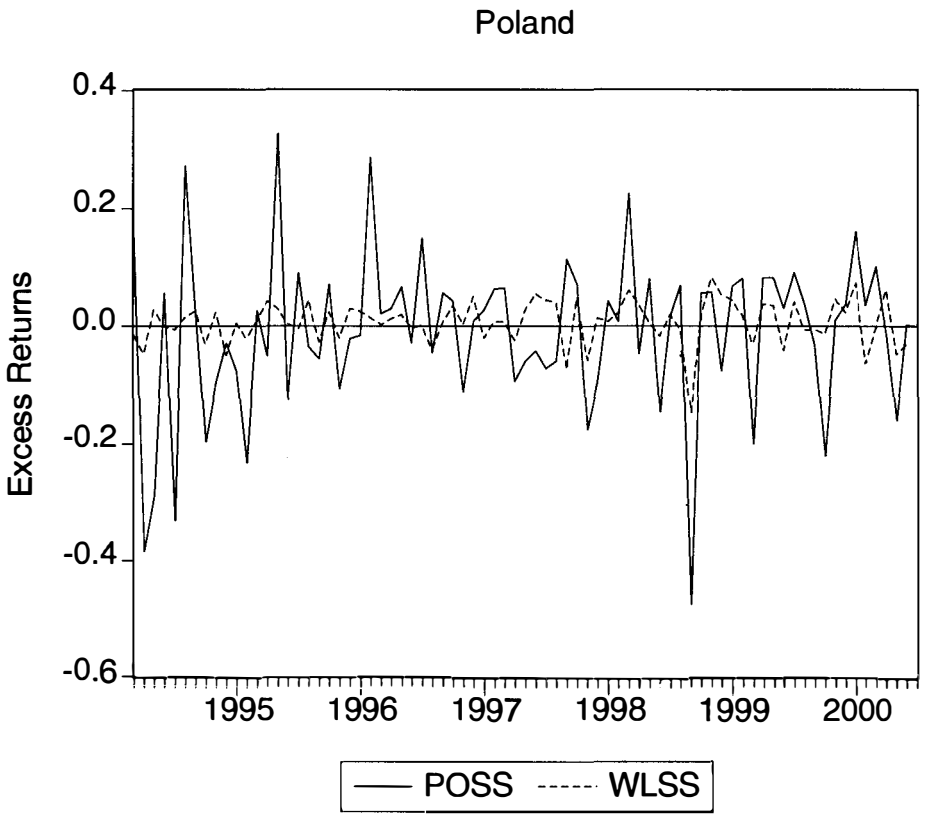


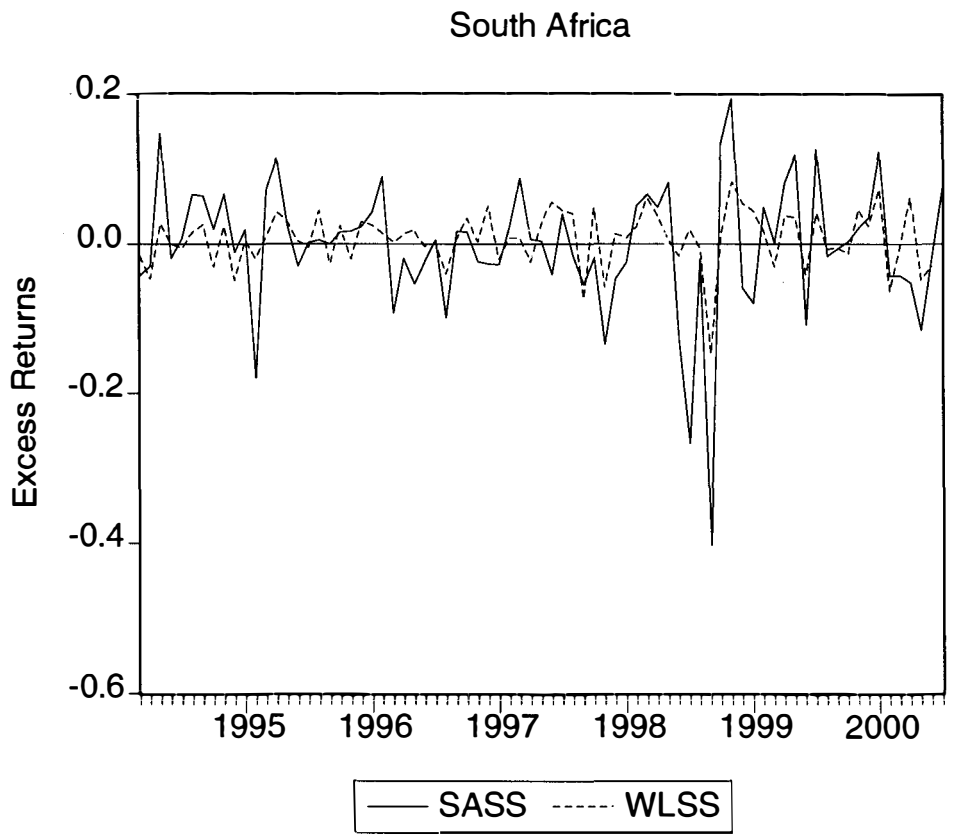
Mexico

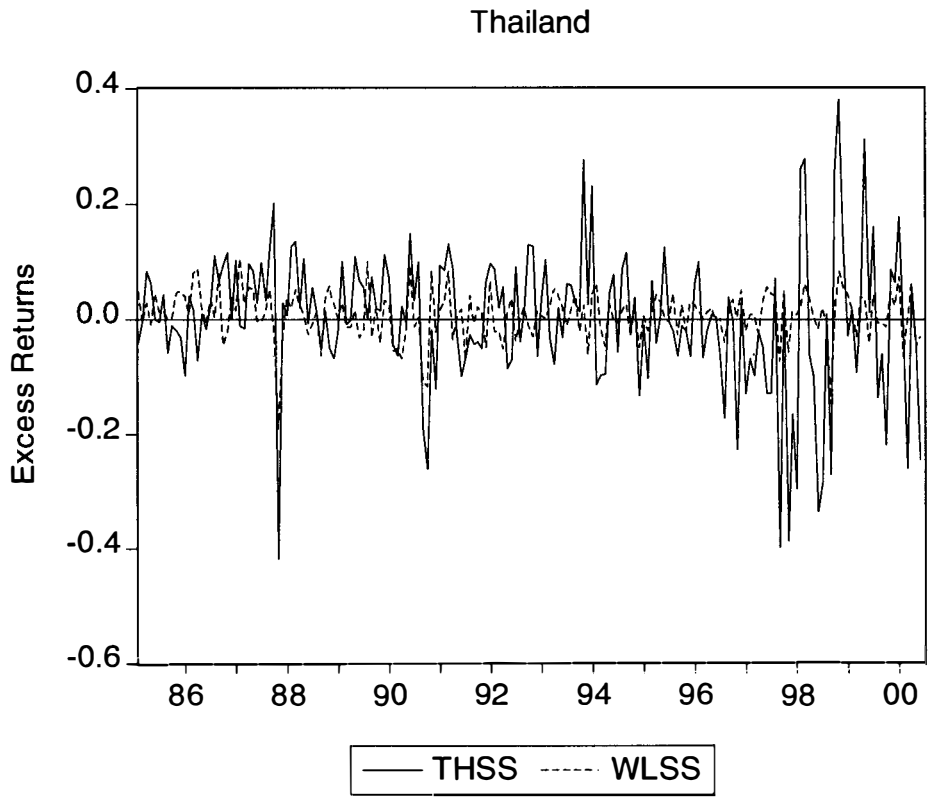


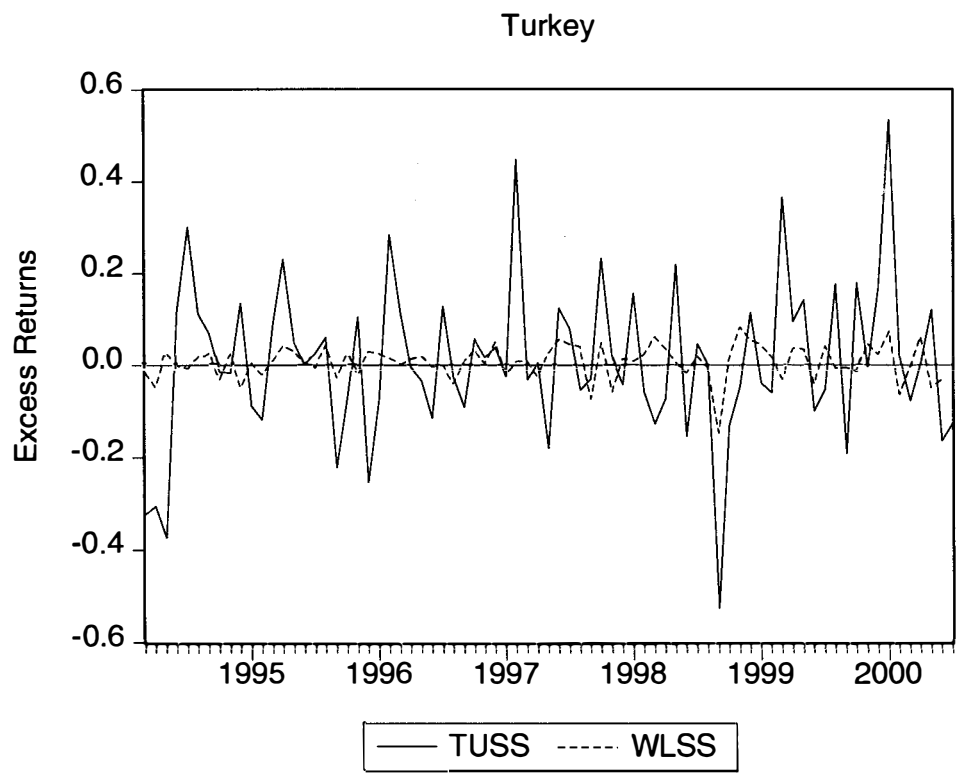

Nigeria
Excess Returns
1.0
0.5
0.0
-0.5
-1.0
-1.5
86
88
90
92
94
96
98
00
NISS
WLSS

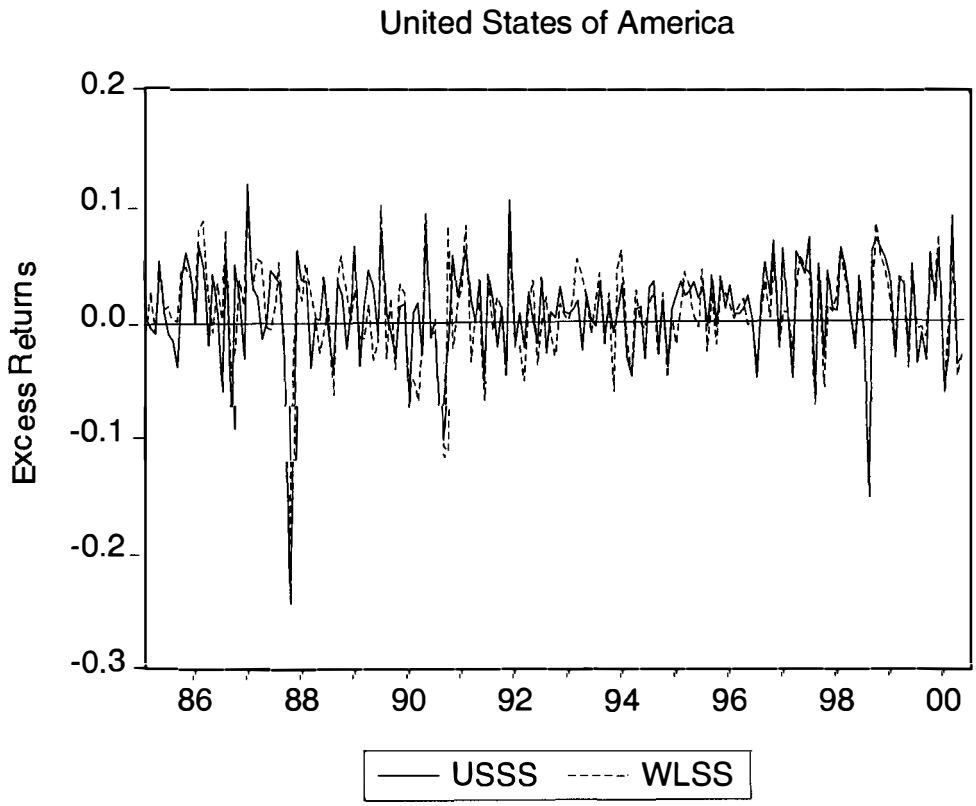

Philippines
Excess Returns
0.4
0.2
0.0
-0.2
-0.4
86
88
90
92
94
96
98
00
PHSS
WLSS

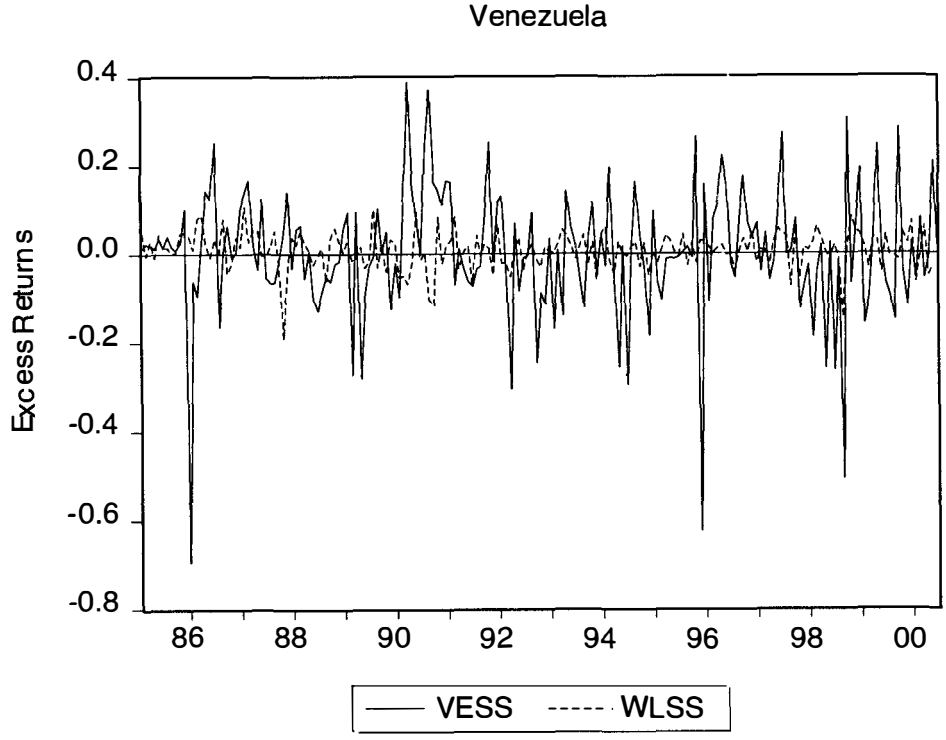

Poland
Excess Returns
0.4
0.2
0.0
-0.2
-0.4
-0.6
1995
1996
1997
1998
1999
2000
POSS
WLSS

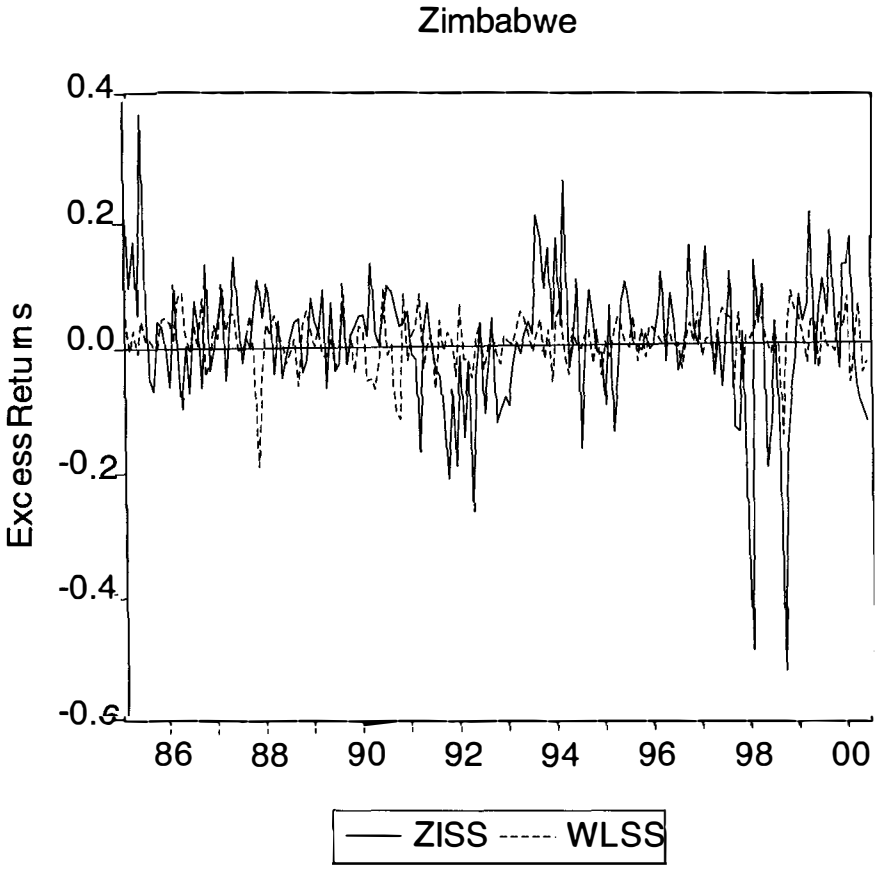

South Africa
Excess Returns
0.2
0.0
-0.2
-0.4
-0.6
1995
1996
1997
1998
1999
2000
SASS
WLSS


Thailand
Excess Returns
0.4
0.2
0.0
-0.2
-0.4
-0.6
86
88
90
92
94
96
98
00
THSS
WLSS


Turkey
Excess Returns
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
1995
1996
1997
1998
1999
2000
TUSS
WLSS


United States of America
Excess Returns
0.2
0.1
0.0
-0.1
-0.2
-0.3
86
88
90
92
94
96
98
00
USSS
WLSS


Venezuela
Excess Returns
0.4
0.2
0.0
-0.2
-0.4
-0.6
-0.8
86
88
90
92
94
96
98
00
VESS
WLSS


Zimbabwe
0.4
0.2
0.0
-0.2
-0.4
-0.6
Excess Returns
86
88
90
92
94
96
98
00
ZISS
WLSS

APPENDIX V: Start dates for local instrumental variables

COUNTRY	START DATE	VARIABLE
Argentina	1985: 2	exchange rate interest rate not available
Brazil	1996: 2 1995: 4	interest rate exchange rate
Chile	1994: 2 1986: 4	interest rate exchange rate
Czech	1995: 3 1994: 2	interest rate exchange rate
Greece	1990: 3 1987: 9	interest rate exchange rate
Hungary	1994:2 1994:2	interest rate exchange rate
India	1993: 2 1986:2	interest rate exchange rate
Indonesia	1994: 2 1992: 2	interest rate exchange rate
Jordan	1987: 3	exchange rate interest rate not available
Korea	1995: 3 1986: 3	interest rate exchange rate
Malaysia	1986: 4 1994: 3	interest rate exchange rate
Mexico	1995: 2 1985: 2	interest rates exchange rate
Nigeria	1994: 3 1986: 2	interest rate exchange rate

COUNTRY	START DATE	VARIABLE
Philippines	1986: 4	interest rate
	1986: 4	exchange rate
Poland	1994: 2	interest rate
	1994: 2	exchange rate
South Africa	1994: 2	interest rate
	1994: 2	exchange rate
Thailand	1986: 8	interest rate
	1986: 8	exchange rate
Turkey	1992: 8	interest rate
	1988: 1	exchange rate
Venezuela	1991: 4	interest rate
	1992: 8	exchange rate
Zimbabwe	1989: 2	interest rate
	1988: 7	exchange rates

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