AN EMPIRICAL INVESTIGATION INTO MALAYSIA'S ECONOMIC GROWTH: INCOME INEQUALITY AND FOREIGN DIRECT INVESTMENT

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ABSTRACT

This paper embarks on an extensive empirical investigation on economic growth for Malaysia, with attention on income inequality, foreign direct investment, financial development and trade. OLS procedure was employed in experimenting with different proxies for financial development and finds robust positive relationship between growth and financial development. FDI and trade are also found to be significant contributors to Malaysia's economic development. Income inequality however, does not seem to exhibit meaningful statistical relationship. These findings are generally mirrored in the three cointegrating regressions employed namely FMOLS, CCR and DOLS procedures. The orders of integration for variables used have been demonstrated to be governed such that a long-run relationship prevails. Additionally, bivariate long-run relationship is also found between growth and FDI, income inequality and FDI as well as financial development and FDI. In short-run horizon, statistical significance of financial development and trade breaks down, and the effects of income inequality and trade reverses. Thus effectively, FDI is the only variable considered in this paper to have significant implications on growth in the short- and long-run horizon. This paper also finds evidence of unidirectional causality that runs from income inequality to growth and income inequality to FDI. Bidirectional causality is detected between trade and economic growth. Another experimental consideration fails to reveal any moderating effects stemming from financial development, trade and FDI on the equity-efficiency nexus.

ABSTRAK

Kertas kajian ini mengkaji pertumbuhan ekonomi Malaysia, dengan fokus kepada ketidakserataan pendapatan, pelaburan asing langsung (FDI), pembangunan kewangan dan perdagangan. Kaedah OLS digunakan bagi mengkaji kesan pelbagai indikator pembangunan kewangan dan didapati semua indikator menunjukkan perhubungan positif yang utuh dengan pembangunan ekonomi. FDI dan perdagangan juga didapati menyumbang kepada pembangunan ekonomi negara. Namun, ketidakserataan pendapatan tidak menunjukkan perhubungan yang utuh dengan pembangunan ekonomi. Keputusan yang diperoleh juga disokong melalui kaedah FMOLS, CCR dan DOLS. Tingkat integrasi menunjukkan bahawa terdapat perhubungan jangka masa panjang antara pembolehubah yang telah diguna pakai dalam kajian ini. Selain itu, perhubungan jangka panjang bivariat juga didapati antara pertumbuhan ekonomi dengan FDI, ketidakserataan pendapatan dengan FDI dan pembangunan kewangan dengan FDI. Dalam jangka masa pendek, keutuhan statistik bagi pembangunan kewangan dan perdagangan tidak dicapai serta kesan ketidakserataan pendapatan dan perdagangan keatas pertumbuhan ekonomi bertukar. Justeru, FDI merupakan satu-satunya pembolehubah yang utuh kesannya keatas pertumbuhan ekonomi, dalam jangka masa panjang dan pendek. Kausaliti satu arah didapati dari ketidakserataan pendapatan ke pertumbuhan ekonomi dan ketidakserataan pendapatan ke FDI. Kausaliti dua arah didapati antara perdagangan dan pertumbuhan ekonomi. Kesan moderator FDI, pembangunan kewangan dan perdagangan keatas perhubungan antara pertumbuhan ekonomi dan ketidakserataan pendapatan tidak dapat dibuktikan keutuhan statistiknya.

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ABBREVIATIONS

3SLS	- 3 Stage Least Squares
ACFTA	- ASEAN–China Free Trade Area
ADF	- Augmented Dickey-Fuller
AFTA	- ASEAN Free Trade Area
AIC	- Akaike Information Criterion
ANOVA	- Analysis of Variance
AR	- Autoregressive
ARCH	- Autoregressive Conditional Heteroskedasticity
ARDL	- Autoregressive Distributed Lag
BNM	- Bank Negara Malaysia
CCR	- Canonical Cointegrating Regression
CFS	- Certificate of Free Sales
DOLS	- Dynamic Ordinary Least Squares
DW	- Durbin Watson
ECM	- Error Correction Model
ECT	- Error Correction Term
EPU	- Economic Planning Unit
ESS	- Explained Sum of Squares
FDI	- Foreign Direct Investment
FGLS	- Feasible Generalised Least Squares
FIE	- Foreign Invested Enterprises

FMOLS	- Fully Modified Ordinary Least Squares
FSMP	- Financial Sector Masterplan
GDP	- Gross Domestic Product
GMM	- Generalised Method of Moment
IIT	- Intra-industry Trade
IPO	- Initial Public Offering
IRF	- Impulse Response Function
LM	- Lagrange Multiplier
LRSM	- Long-run Structural Modelling
MATRADE	- Malaysia External Trade Development Corporation
MENA	- Middle East and North African
NEP	- New Economic Policy
OECD	- Organisation for Economic Co-operation and Development
OLS	- Ordinary Least Squares
PIA	- Promotion of Investment Act
SUR	- Seemingly Unrelated Regression
TSS	- Total Sum of Squares
UECM	- Unrestricted Error Correction Model
VAR	- Vector Autoregressive
VECM	- Vector Error Correction Model
VIF	- Variance Inflation Factor
WDI	- World Development Indicators

1 INTRODUCTION

Of the many influences on growth, income inequality, financial development and foreign direct investment have been among the most heated topics in the economics profession. This paper hence embarks on an empirical study of these factors, in an attempt to lend support to a growing body of literature on this subject.

Impetus towards economic development is perhaps the single economic goal that all nations share. Evidently, more often than not, gross domestic product (GDP) becomes the focus of politicians and private entities alike. Sub-performance of this indicator is potentially a source of contention among policy makers and those with vested interest. Another crucial dimension of economic development, which deserves as much consideration is, income distribution. Intrinsic value of income distribution arises from the fact that growth, if not distributed fairly, may result in social disruptions which are in turn potentially adversarial to GDP growth. Moreover, as per aim of this paper to investigate, there may exist an empirical connexion between income distribution and economic growth. Thus, it is sensible to promote growth, while maintaining fair income distribution. There are various ways how this may be achieved, one of which includes the fiscal tool of taxation. Socialists promote using taxes as a form of redistributive tool. Income generated by a country is to be shared among its people apart of being used for development purposes. Proponents of laissez-faire on the other hand, strive for minimal taxes on income. Too high of a tax rate discourages productivity and may induce out flux of talents that may impede economic growth. This stems from the argument that human capital is one of the pivotal sources of growth. This argument also bodes in favour of the so called efficiency-equity trade-off. The extent of a country adheres to which pole of economic thought will have consequence on her performance. Additionally, country-specific conditions play essential role in determining whether inequality in distribution of income is adversarial or favourable to economic growth.

A less controversial point for source of growth is financial development. Endless literature argues that financial development promotes output growth. This is achieved through the fulfilment of intermediation roles, which are efficiently executed by financial intermediaries. Key function of intermediaries is to act as a transfer agent in channelling funds from entities with surplus of resources, to those who have the capacity to put those resources to productive use. For the sake of simplicity, consider depositors whose assets are checked into a bank. The bank then has access to a pool of funds, which are now liabilities for the institution. It will then transform these liabilities into assets, by providing loans to private entities that intend to make use of those funds for productive activities and generate profits. Described was the mechanics of this transfer process in its simplest form. Of current however, this process may involve multi-tiered system of savers and investors, especially more so in an advanced financial market like that of U.S.'s.

The flow of funds via financial intermediaries instead of directly from savers to borrowers is conventionally coined indirect finance (Mishkin & Eakins, 2012). This channel is generally preferred by economic agents as opposed to direct finance due to financial institutions' ability to perform its intermediation role efficiently, which arises from: (i) minimisation of transaction costs; (ii) risk sharing; and (iii) reduction in information asymmetry. Transaction costs associated with transfer of funds consist of contractual fees, search costs, possibility of default etc. Individual investors would be dissuaded from making investments due to the repressing nature of these costs. Financial institutions on the other hand, are able to capitalise on scale economies, thus reduce the said costs, enabling them to channel funds competitively. On top of directly computable transaction costs, savers are also faced with probability of default on the part of borrowers. This is another potential hindrance to savers that financial intermediaries are able to reconcile by risk sharing. Once adequate amount of funds are at the disposal of the institutions, they are able to utilise these funds by investing them in a portfolio, ranging from low- to high-risk investments. Possibility of losses from high risk projects are cushioned by profits from other investments in the portfolio, an advantage that individual savers are not capable of. Experience and knowledge in the financial system also enables financial institutions to screen bad creditors from the good ones. This reduces information asymmetry between savers and borrowers that is prevalent in any material transactions.

Absence of this fundamental role will thwart output growth. Aforementioned point indicates a strong link between the financial and real sector. It is expected therefore, a decline in GDP growth will result when a financial crisis ensues. A mechanism is in order. Financial crises may arise out of various reasons, macroeconomic volatility, imprudence in lending and lack of regulation to name a few. The main effect of these causes however, is similar. Disruptions in flow of funds back to the stakeholders demote investors' confidence in the system. This leads to a reduction in supply of funds. Borrowers, irrespective of credit standing will then find the opportunity to obtain financing for undertakings to be grim. Hence at the aggregate level, there will be a decline in economic activities, inevitably leading to a fall GDP growth. The recent global financial crisis in 2007 testifies to this. Although the extent of which Malaysia was affected in the crisis in 2007 is subject to deliberation, there is no certainty that Malaysia will not face a financial crisis as severe as this, that it has significant adverse impact on output growth.

Economic theory suggests that investments are imperative to economic development. Financial sector development without equivalent progress in investments will render headway made in the former futile. For a small open economy like Malaysia, foreign investments play a key role in its developments. Inflow of foreign investments may take two forms namely, portfolio and direct investments. Portfolio investments constitute of foreign capital being mobilised into a host country, materialising as stocks or bonds. Though undoubtedly this sort of investment is intrinsic in a nation's progress, the effects are limited to that of funds transfer. Another form of foreign participation namely foreign direct investments has the potential to generate output growth, through other means that are not as direct as foreign portfolio investments. The implications on growth however, may be greater than that of the direct channel of foreign funds transfer.

Moreover, the flow of FDI more often than not, is more stable than that of portfolio investments. This is the result of the fact that magnitude and nature of FDI is such that, it will be a daunting move for foreign firms to reverse investments made in the host country. Investments in equipment and machineries, human resource, buildings etc. are substantial and occupy materially significant resources and commitment. Hence, FDI seems like a reliable and valuable source of foreign investments. It will therefore be considered a utilitarian move by policy makers, to encourage inflow of FDI into the country. For this to transpire however, business environments need to be conducive. Such factors as easy access to local finance services, competitive tax structure, reliable legal framework, capital mobility and political stability are all part of considerations faced by foreign direct investors in determining investment destinations.

A compelling link between FDI and economic development is productivity spillover (Crespo & Fontoura, 2007). Production processes, managerial culture and machineries are all part of technological transfers that the literature on FDI emphasises on. This transfer of technology is vital because technological progress, as advanced in neoclassical theories, is the only way for a country to grow in the long run. FDI succours this progress, thereby assisting economic growth conquest. Arising from this transfer effect, is a more perpetual benefit that the FDI receiving country is poised to gain from. Foreign firms are more likely to develop skills of its worker as opposed to local firms (Crespo & Fontoura, 2007). Training received by employees of foreign firms will be ingrained at a personal level, enabling skills adopted to be utilised, even if their term of employment with the firms has ended. The same set of skills could then be transferred to prospecting domestic employers, who will indubitably benefit. In aggregate sense, there will be an advancement of labour force, arising from technology transfer effect. These factors compound on each other, expediting growth.

In the spirit of open economy, trade plays an important role in a country’s progress. Increasing integration between economies is prevailing, making it unreasonable to simply ignore the one thing that perhaps links civilisations and accelerates globalisation today.

Theoretically, trade has been in the context of intellectual discussion since the 16th century with the rise of mercantilism which proposes that countries that maintain a trade surplus will always gain at the expense of importing countries. Subsequent progress led to the absolute endowment and comparative advantage theories which advocated that countries that are resource abundant, in absolute or relative terms will benefit from trade. Recent developments in the world economy has provided new insights for the development of new trade theories which take into account possibility of increasing returns to scale and network effects.

Empirically, trade's effect on growth is probably one of the most prevalent for open economies. Opening up to international markets enables domestic producers to benefit from a greater pool of consumers. This demand factor drives production upwards, lowering production costs, which is a resultant of scale economies. On the part of domestic consumers, they too benefit from international trade in terms of greater choices. The greater variety faced by consumers empowers them to a certain extent, in lowering market-clearing price of domestically produced goods. Thus, apart from production benefits, trade also has favourable welfare effects for participating countries.

On the other hand, some quarters argue that trade has the potential to induce adverse effects on domestic producers, to the extent that it offsets benefits associated with it. One conjecture that is often erected in this respect is the infant-industry argument. Newly formed domestic firms may find it consternating to compete with well-established foreign producers. Hence, it is believed that by protecting these firms via such measures as extensive import duties, quotas, restrictions and other non-tariff measures will cultivate infant firms' competitiveness. Once the firms mature, the industry may be opened up to international competition. The validity of such argument and thus, justifiability of protectionist measures however, are questionable.

The openness of a country to international market is therefore a determinant to whether it will effectively benefit from trade. The concurrent fact that China opened up to world economy in late 1980s and experienced stellar rise in economic growth ever since testifies to this. It would therefore be an inadequate economic growth discussion if this variable is omitted.

1.1 Developments

For the benefit of explicating the background for this paper, this section discusses historical developments as well as current issues that may be related to matters in study.

1.1.1 Income Inequality

Income inequality may be measured in various ways, the prevailing one in practice being Gini index. It would be beneficial to dedicate a discourse on historical evolution of the said indicator to illustrate Malaysia's position on income distribution.

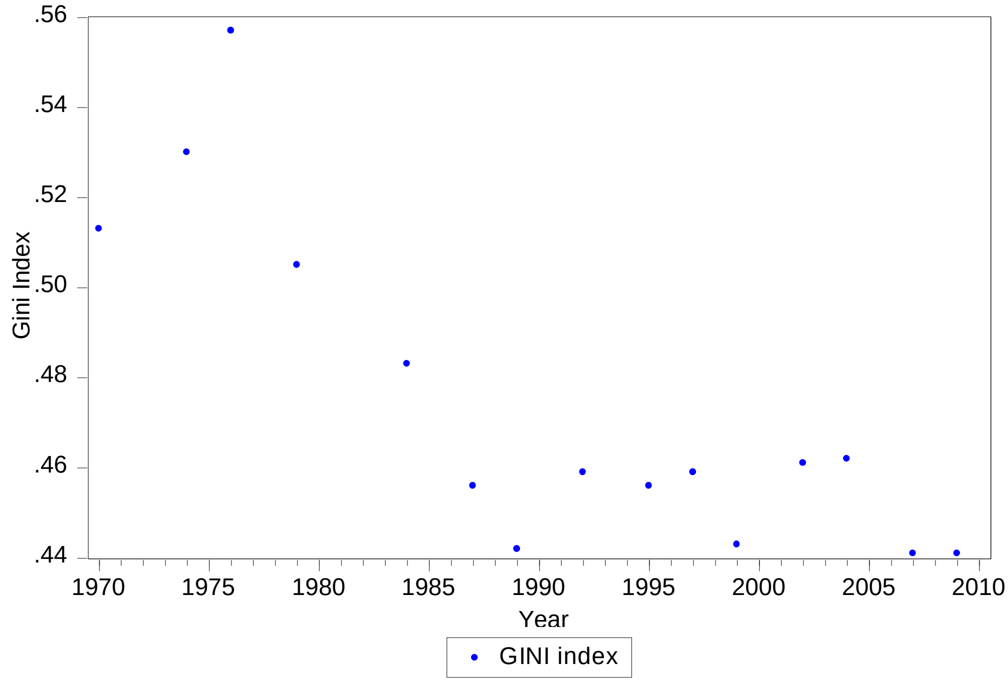

Figure 1.1: Time Series Plot of Malaysia's Gini Indices

In the immediate post-independence period, there was a worrying trend of increasing income inequality in the nation. Much of that trend stems from inter-regional hence, inter-racial income disparity. This is due to historical incidence that resulted in a geographical divide among the multi-racial society. It is this unfortunate incidence too that has resulted in social unrest that took place in 1969. It was believed that rising inequality was the chief reason for the brawl in the late 1960s.

Naturally, the government at the time championed income redistributive policies, mainly governed by the New Economic Policy (NEP) in 1971. As a consequence of the government's affirmative actions, inequality declined considerably from 1976 through to late 1980s. This implies that policies pursued were in full appreciation of economic thought. Post-dating that period however, there were no significant changes in Gini index. The index seemed to fluctuate around a constant mean for more than two decades. The last recorded Gini stood at 0.441.

The fact that the index did not improve much for the last two decades may indicate a systemic problem. Policies that were in place in 1970s to abate the growing inequality problem was ethnicity based. While it indeed seemed to rectify the problem for the first 20 years, it did not seem to exert much of an impact in the following years. This could indicate a decline in ethnic based income inequality, but a prevailing inter-personal income inequality, one that is captured by the Gini index. At this juncture however, one would not place much weight on this, as further discourse into this it warranted.

1.1.2 Financial Development

Presence of financial intermediaries could be traced back since before independence. British colonisation in late 1800s in the states of Penang, Malacca and Singapore meant that a modern financial system was needed to cater British activities in the region. Thus, Mercantile Bank and Chartered Bank were set up in Penang, which served as an important financial hub in that era. Abundance of natural resource in the region fuelled financial activities, as funds were being transferred from British to the Straits Settlements and repatriation of profits back to the colonist.

More recent developments in Malaysia's financial sector is anything but dreary. The sector had gone through numerous reforms throughout its history. The adoption of NEP in 1971, meant to reduce inter-ethnic tensions arising from economic disparity entailed affirmative actions, relating to such matters as business activities with the government, quotas allocated to IPO ownership in the stock market and awarding of operating licences. As a consequence of such policies however, foreign capitals and a significant share of domestic investments were partly deterred, due to non-accommodative environment. Acknowledging a link between investment and financial sector, these developments that occupied a wide time range is a possible source for limiting progress in Malaysia's financial market in the early post-independence period. The year 1990s however observed matters turned for a change. Realising the stifling effect of strong implementation of affirmative actions affected investments, particularly foreign investments, some measures were relaxed to be more accommodative of private ventures.

In 1997, when speculative attack struck Thai Baht, Malaysian government imposed capital controls which meant halting offshore trading of the Malaysian Ringgit (RM), to counter competitive currency devaluation that drove down the currency. The financial sector was badly hit. Prompt action by the authorities however, managed to pull the country out of the crisis fairly quickly. Some contend however, capital controls are potentially malicious to foreign investments in the long run. Subsequent actions, which included restructuring the corporate and banking sector however, eased some of this concern.

In the post Asian Financial crisis period, two masterplans were conjured up by the authorities as a spearhead for the development of financial sector. Financial Sector Masterplan (FSMP) was released in 2001, which serves as a guide for the advance financial institutions for the period 2001 to 2010. As a result of implementation of the FSMP, Malaysia's financial environment became more conducive for investors at large, specifically foreign investors. Regulations that previously bound financial institutions stringently were relaxed in order to promote flexibility, enabling them to expand and garner profits.

In 2011, Bank Negara Malaysia (BNM) launched the Financial Sector Blueprint (Blueprint) to serve as the next chaperon of an on-going development effort of the financial sector. This second masterplan outlines what ought to be done for the betterment of the financial landscape which spans from 2011 to 2020. Hence, the plan still has several more years before the end of its operation. In the second version of the masterplan, more emphasis is placed on nurturing a financial sector that is able to sustain a high-income and developed economy, in line with the country's aspirations. In addition to that, Malaysia's central bank has been actively promoting Malaysia as a hub of Islamic finance, on top of other financial services meant to cater the needs of growing economies in Asia, particularly such neighbouring countries as Thailand and Indonesia. Stipulated are the nine core areas that are under focus in the Blueprint:

i) Effective intermediation for a high value-added, high-income economy;

ii) Development of deep and dynamic financial markets;

iii) Greater shared prosperity through financial inclusion;

iv) Strengthening regional and international financial integration;

v) Internationalisation of Islamic finance;

vi) Safeguarding the stability of the financial system;

vii) Achieving greater economic efficiency through electronic payments;

viii) Empowered consumers; and

ix) Talent development for the financial sector.

This vigorous move towards developing the financial sector is important for Malaysia, as it strives to become a high income country. Malaysia's economy has departed from its comparative advantage in low-cost labour, which has been one of chief contributors behind its stellar rise in the 1990s. Hence, financial services is seen as the next major contributor to economic growth. BNM projects financial depth to be six times of GDP and contribute up to 12 per cent of nominal GDP by the year 2020.

Currently, there are 8 anchor banks namely: (i) Malayan Banking Berhad; (ii) CIMB Bank Berhad; (iii) Public Bank Berhad; (iv) Hong Leong Bank Berhad; (v) AmBank Berhad; (vi) RHB Bank Berhad; (vii) Affin Bank Berhad and (vii) Alliance Bank Berhad. Additionally, there are 31 foreign owned financial institutions some of which include Citibank Berhad, United Oversear Bank Malaysia Berhad and Al-Rajhi Banking and Investment Corporation (Malaysia) Berhad. These institutions complement investments and other economic activities, which are poised for the betterment of economic standing.

1.1.3 Foreign Direct Investment

Two forces drove the surge of FDI inflows in the pre-Asian financial crisis period. The first is policy measures introduced by Malaysian authorities, second is the trend of foreign investments at the time. The Investment Incentives Act (1968), Free Trade Zone Act (1971) and Promotion of Investments Act (1986) are among policy measures erected by the government to induce foreign investments. Incentives such as income tax exemptions and reinvestment allowance are greeted fervently by foreign investors as it enables profit generation with ease. Second factor at play in FDI inflow pattern was the growing outflow of direct investments from the developed world. In keeping up with growing world demand, which in turn stems from globalisation, manufacturers had to relocate production processes to regions with low wage rate. This is to minimise production costs, as the wage rate in developed countries are substantially higher than that of lower income countries. At the time, the market-clearing wage rate in Malaysia was competitive in the world market.

The two forces discussed compound on each other, inducing a surge of FDI inflows. Indeed, there was a sizeable appreciation in FDI as a percentage of GDP from mid-1980s through to early 1990s. Leading to 1997, FDI slowed down and plummeted. After the Asian financial crisis, the trend did improve, but remained docile and well below its record high.

More saliences in FDI's trend as depicted in Figure 1.2 are steep fall in 2001 and 2009. The decline in 2001 was largely due to slow down of economic activities worldwide, which resulted from booming oil prices in 2000. The spike of the all-too-important commodity price meant that costs of doing business generally increases too. It is hence expected that private investments including FDI will collapse, as seen in Figure 1.2.

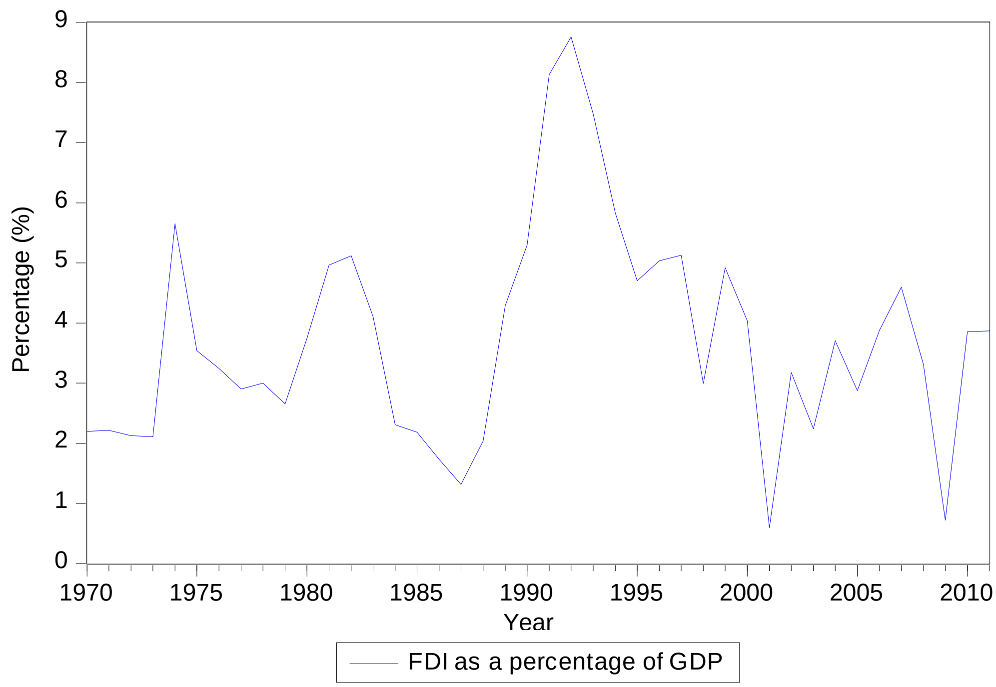

Figure 1.2: Foreign direct investment as a proportion of GDP

Year 2008 witnessed the dramatic failure of prominent financial institutions in the U.S. due to sub-prime credit crisis. The fact that various complicated financial instruments were involved in the crisis accentuated the effects on the sector. Eventually, what started out as a financial predicament grew into a full-fledged economic crisis, with business lacking insufficient funds because of restrictive lending on the part of financial institutions after the fall-out. Consequently, private entities had to cut back on investments, which led to the decline in FDI observed in 2009.

It should also be noted however, that FDI is generally volatile. Close inspection reveals that FDI sways considerably from year to year in certain periods. This behaviour is in part due to Malaysia's waning competitiveness in terms of attracting FDIs. Over the years, the country has climbed up the income ladder, positioning its self as a middle income country. Wage rate of labour force therefore, is higher than that of other low income countries such as Vietnam, Indonesia and the likes. FDI will hence flow into these low wage rate regions instead of Malaysia. Concurrently, the country finds it hard to compete in high technologically induced production processes, thus losing out to countries like Japan and South Korea in that respect. This occurs due to a slack in innovative capabilities and productivity of the workforce, something that has been attributed to inefficient education system and insufficient spending on R&D. Compounding on this, is the outflow of FDI from Malaysia into other regions. There is an increasing number of domestic manufacturers that mature and seek expansion of operations in other countries to gain various advantages such as tax incentives, low operating costs and competitive labour costs.

This new behaviour of FDI has affected Malaysia in so far as it limits progress stemming from spillover effects associated with FDI. Insufficient foreign investments, particularly in high-technology production impairs development as the country is unable to gain knowledge transfer and spillover, that undoubtedly will generate economic growth.

1.1.4 Trade

Dating back to its early history, trade has always been an intrinsic part of Malaysia's economic activity. This is largely accrued to its locational advantage, that links major trading partners via the straits of Malacca. Globalisation however, has seen the decline in importance of locational advantage due to progress in transportation and cost reductions. For the benefit of discussion, it would be prolific to historically outline trade pattern in Malaysia's modern history.

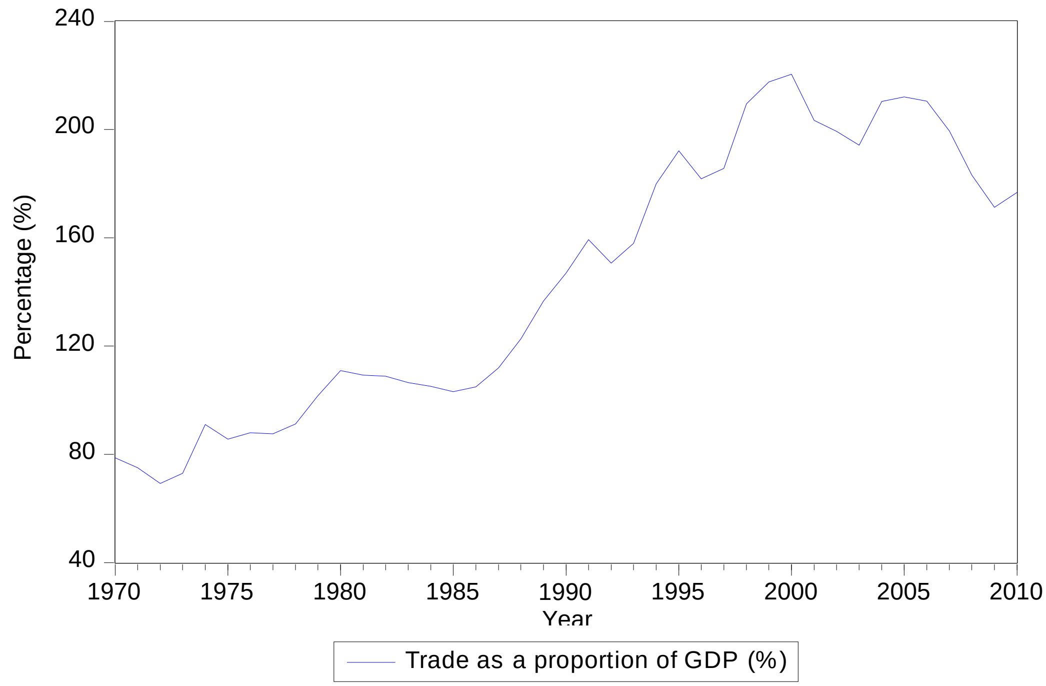

Figure 1.3: Trade as a proportion of GDP

Generally, Malaysia's trade with the rest of the world has been on an upward trend since the 1970s. Catapulting trade to its start are established relationship with its colonist and locational as well as resource-abundance advantage enjoyed in its early history. Ranging from 1980 to 2000, considerable incline is observed in trade trend. Short term wise however, the series exhibited volatility, atypically from 1990 onwards. The newly observed behaviour in the last two decades of 20th century is partly due to a more dynamic trade relationship in the global economy. The opening up of China and India to international market for instance, has resulted in a new pool of demand for commodities and supply of labour. This may have generated trade creation as well as trade diversion effect which is definite to have its implications on Malaysia. The ASEAN–China Free Trade Area (ACFTA) which the bloc and Asian economic giant subscribed to in 2002 for example, is poised to have trade creating effect on commodities that Malaysia possess competitive advantage in producing.

The move from being a largely primary commodity exporter to manufacturing in E&E industry may have resulted in further volatility in trade. Although it has evidently contributed to a significant rise in Malaysia's trade participation in the market, the industry is particularly sensitive to external conditions. Trade developments in the 1990s could also be explained by ASEAN Free Trade Area (AFTA) agreements. Relatively more aggressive liberalization of trade among ASEAN countries may have prompted a long-run increase and short-run volatility as can be seen in Figure 1.3. Significant progresses in AFTA made in the 1990s include:

- Commencement of 0-5% tariff reduction for intra-regional trade; and
- Adoption of Agenda of Greater Economic Integration, which entails further trade liberalization among ASEAN countries.

Realising the importance of international trade particularly exports to the economy, authorities established the Malaysia External Trade Development Corporation (MATRADE) as an initiative to promote and assist domestic enterprises in exporting their products and services. Incentives promoted by the body include: (i) double deduction for promotion of exports; (ii) tax exemption; (iii) investment tax allowance; and (iv) capital allowance and special incentives which are governed by the Promotion of Investment Act 1986 (PIA). Additionally, MATRADE also issues Certificate of Free Sales (CFS) to domestic household product manufacturers, which assures importers that the goods are sold in a free market domestically.

1.2 Research Problem

Studying the influence of income inequality, financial development, FDI and trade on economic growth as well as the dynamic relationship among the variables requires extensive statistical analysis. Before undertaking the procedures however, it would be beneficial to highlight the data pattern exhibited by the variables of interest, as a point of departure for this research.

As can be seen in Table 1.1, income inequality has not varied much over the years. One would anticipate as the country progresses, Gini index would decline significantly. This however, is not the case. For instance, Gini index in 2009 is 46.21 as opposed to 48.62 in 1984. Although the year 2009 observed a negative growth, Malaysia maintained relatively strong growth record for the most of the preceding years. Similarly in 1995, GDP growth rate was at a record high at time dimensions where Gini data are recorded, at 9.83%. GDP growth rate performed well too in the years leading to 1995. The Gini index however, declined from 48.83 in 1984 to 48.52. Fact that the inequality measurement index did not change significantly despite growth maintaining strong momentum and inequality reduction measures in place, raises the question of whether the concern on growth and equity trade-off has a valid basis. It would therefore be beneficial to embark on an investigation regarding this matter.

Table 1.1: Selected Gini indices and Corresponding GDP Growth Rates

	1984	**1987**	**1989**	**1992**	**1995**	**1997**	**2004**	**2007**	**2009**
GDP growth (annual %)	7.76	5.39	9.06	8.89	9.83	7.32	6.78	6.48	-1.64
Gini index	48.63	47.04	46.17	47.65	48.52	49.15	37.91	46.0	46.2

Figure 1.4 depicts M2 and GDP growth rates. Following Townsend and Ueda (2006), M2 growth represents growth in financial development. As financial institutions are more involved in the economy, the broad measurement of money increases. From the plotted graph, the two variables seem to generally move together. However, at certain points of time, M2 and GDP growth rates seem to diverge. In 1990 for instance, M2 growth rate is negative at approximately 43% while there is positive GDP growth at 9% in the corresponding year. Moreover, at certain intervals, M2 seem more volatile while at other intervals, both variables seem to exhibit similar volatility. This raises the question on the concreteness on the relationship between financial development and economic growth. It would therefore be constructive to critically analyse these developments.

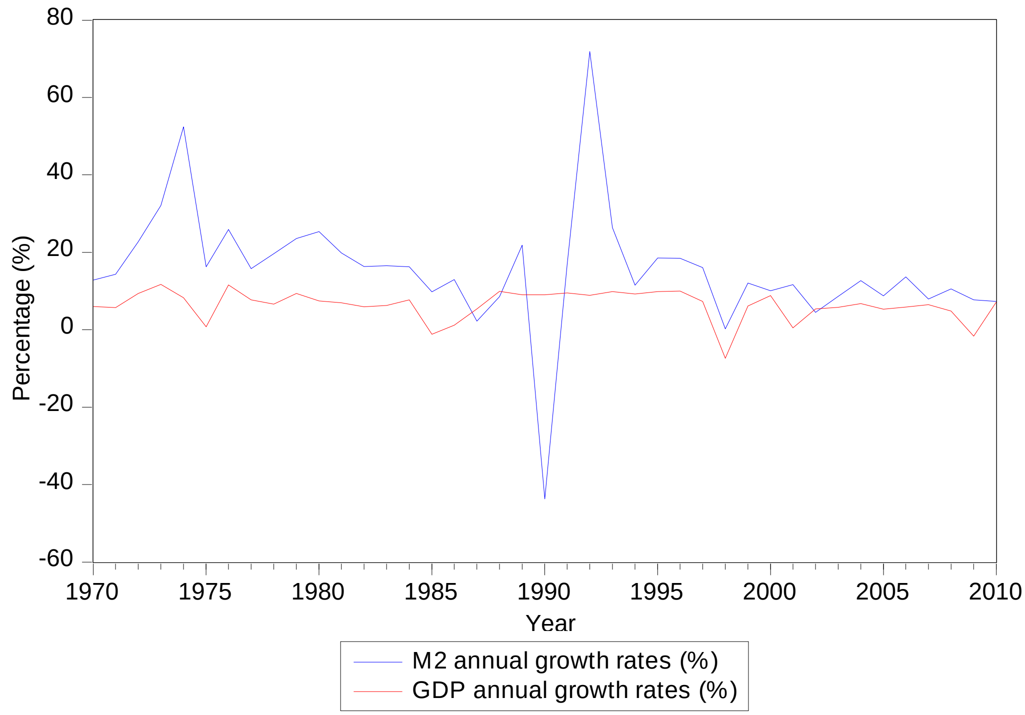

Figure 1.4: Money and quasi money (M2) and GDP growth rates

FDI and GDP tend to move together as can be observed in Figure 1.5. Acknowledging the fact that FDI's growth on GDP can be lagged, there is a question of causality that needs answering. For instance, in 1991, FDI as a percentage of GDP increased from previous year from 5.3% to 8.1%. The series edged further upward to 8.7% in 1992. Considering a lag interval, it could be inferred that increment in FDI had induced GDP growth to increase to 8.9% and 9.9% in 1992 and 1993. The first shaded region in Figure 1.5 marks this FDI-led growth hypothesis.

Meanwhile in 2001, a growth rate of mere 0.5% was recorded. Growth however, recovered in the following year, recording a 5.4% increment. This rapid recovery had probably revived investors' confidence in the country, which is reflected by increment in

FDI to 3.7% in 2004 from 2.2% the previous year. The second shaded region represents this growth-led FDI inflow hypothesis.

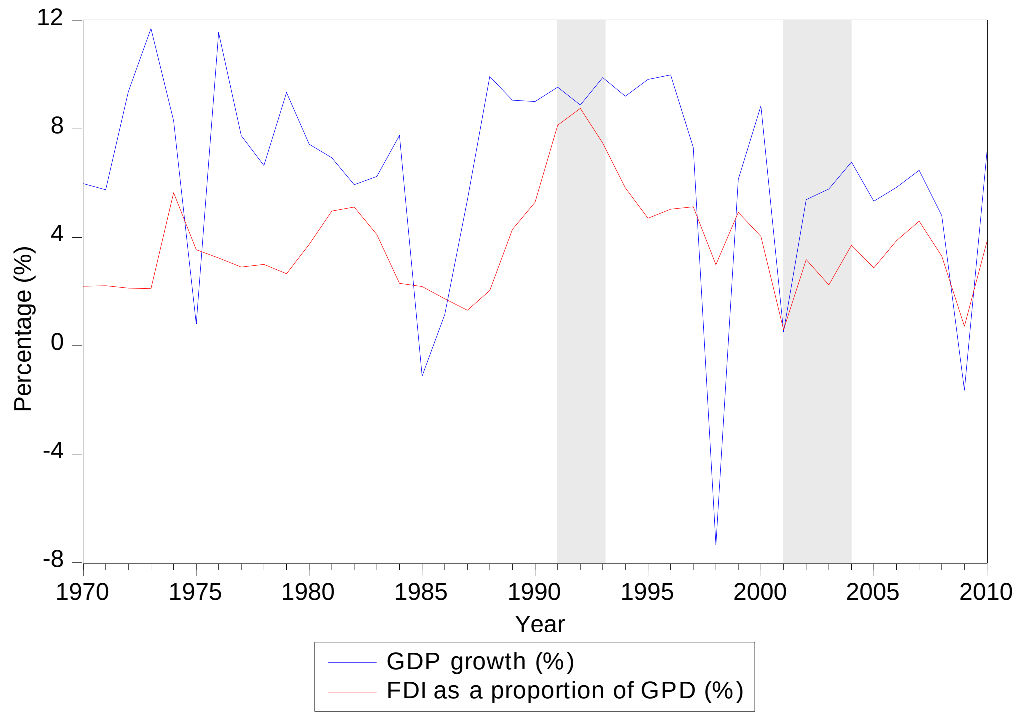

Figure 1.5: GDP growth rates and FDI as a percentage of GDP

In the long-run, there seems to be a persisting relationship between net trade, which measures trade in goods and services, with GDP. Medium-term wise however, there is ambiguity to the nature of relationship between the two. Between 1986 and 1996 for instance, the two series seemed to be on a divergent path from each other. On the other hand, the series seemed to be experiencing similar upward trend from 2002 to 2008. Alas, scrutiny into this behaviour is warranted to ascertain the true nature of association as well as other empirical relationships.

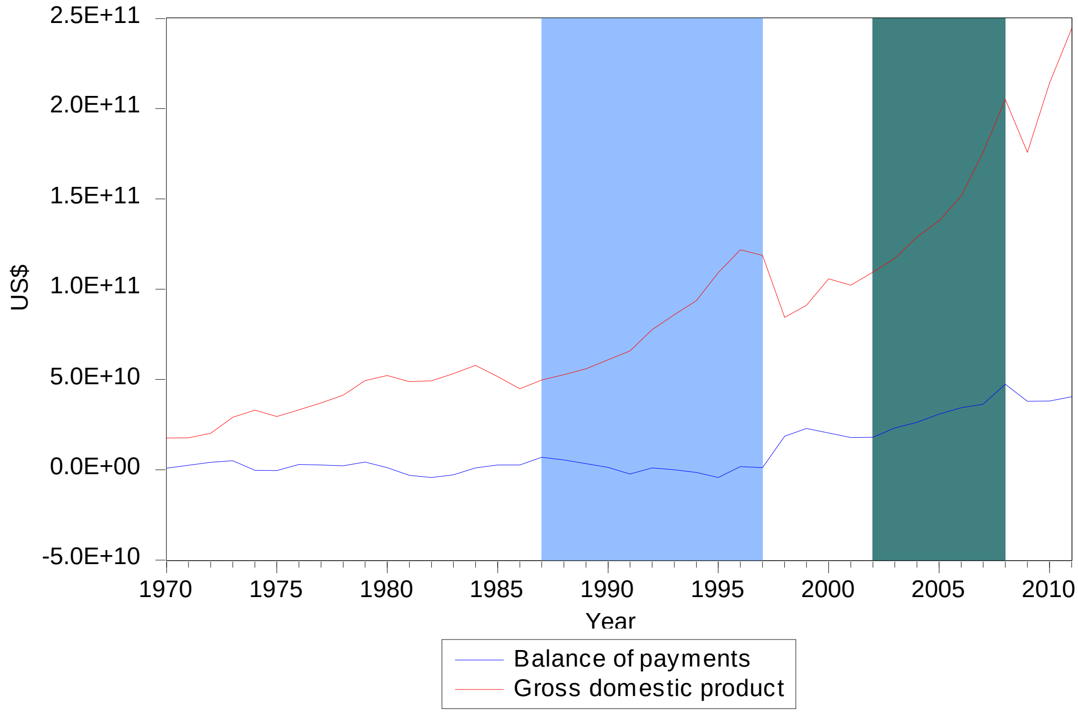

Figure 1.6: Trend of gross domestic product and balance of payments

1.3 Objectives

This section lays out the general and specific objectives that this research aims to attain.

1.3.1 General Objective

This paper seeks to study the relationship between income inequality, financial development, foreign direct investment, trade and economic growth as well as the various connexions that may exist among the variables.

1.3.2 Specific Objectives

In a bid to fulfil the general objective, this paper will examine the association between income inequality, financial development, foreign direct investment, trade with economic growth.

As a complement to the first objective, this paper will investigate the existence of long-run relationship between income inequality, financial development, foreign direct investment, trade and economic growth.

Another aspect of interest that this paper intends to investigate is short-run dynamics among income inequality, financial development, foreign direct investment, trade and economic growth.

This research will also delve into the issue of causality relationships among income inequality, financial development, foreign direct investment, trade and economic growth.

With regard to developments of financial sector, this paper intends to examine the robustness of its relationship with economic growth, by experimenting with different representations of financial development.

As income inequality is one the central issues being raised in this paper, this author seeks to investigate effects of income inequality on growth with moderating forces with respect to financial development, foreign direct investment and trade.

1.4 Significance of Study

This paper's first contribution is twofold. It contributes to the literature and policy makers. Firstly, as will be demonstrated in literature review section of this paper, numerous research has been done in examining growth with regards to income inequality, financial development, foreign direct investment, trade and economic growth. There is yet however, to the best of this author's knowledge, a paper that studies the causal interactions among the aforementioned variables, specifically for Malaysia in a framework as is considered in this paper. For instance, Ang and McKibbin (2007) examined Malaysia's financial sector progress and growth, without considering trade and FDI in the framework. Similarly, Hsiao and Hsiao (2006) considered FDI and growth without the presence of financial progress which may affect FDI-growth nexus. Additionally, as most statistical relationships among variables are country specific, findings of this paper will undoubtedly contribute to the literature. Policy makers are also able to make use findings of this paper to make informed decisions and tailor policies that satisfy causality linkages to achieve optimal growth trajectory.

Second contribution is academically inclined. This paper fuels the debate on proxies that best represent financial development. Several measurements have been tested for this purpose. Similarly for the case of Malaysia, this paper adds to rigour in discussion, by examining several alternatives to represent progress in the financial sector. Conclusions derived from several representations of financial development may also be used by policy makers as a guide for alternative outcomes in policy making.

With respect to income inequality, this paper's contribution is statistically motivated. Again, to the best knowledge of this author, there is a gap in the literature regarding the matter of income inequality. There is a lack of thorough empirical investigation on the effects of income distribution with respect to such economic variables as growth and investments, which in part may be due to availability of data, particularly for the Malaysian case. At best, a panel data study on equity-efficiency nexus has included Malaysia as one of its 75 sample countries, as done by Zhou and Li (2011). This paper then proposes an application of data treatment, which enables further analysis on income inequality with focus on Malaysia. This will also allow investigation on inequality from various perspectives. Hence at the very least, this should trigger a more significant progress in empirical literature with respect to Malaysia's income distribution.

Another statistical contribution that this paper offers is the experimentation on alternative estimation procedures on a given empirical model. Robustness in findings obtained by conventional measures such as the OLS regression which also serve as a focal position of this paper, is examined by comparing results under different estimation techniques.

1.5 Limitations of Study

An important short-coming that this research faces pertains to data availability, particularly on Gini indices. It is largely preferable to obtain data from a single source, to minimise discrepancies in measurement which in turn may arise out of error or procedures followed by different information agencies. This however, may not be achievable as more often than not, data of different aspects are harvested by different agencies. This paper therefore utilises data from minimal amount of sources. With respect to Gini indices however, up to three sources were referred to. Although measurement discrepancies are not expected to be severe, an issue that arises out of Gini indices is the number of data available. The reason behind this is structural. Gini indices in Malaysia are calculated by the Department of Statistics Malaysia, through a census that is done twice every five years. Inevitable therefore, data at disposal is limited. Though this has been addressed by statistical treatment in this paper, it does not negate the fact that in time series investigation, abundance of data is generally desirable.

2 LITERATURE REVIEW

This chapter delineates some of the discussions regarding income inequality, financial development, foreign direct investment and trade in the literature. Particular emphasis will be drawn along the lines of economic growth discussions, to tie a vast and broad body of literature within the vicinity of relevance to this paper.

2.1 Income Inequality

The traditional theoretical basis for the relationship between inequality and growth lies in the Kuznets' curve. Income inequality rises as a country progresses. The trend will continue until the economy reaches a critical point of growth, where inequality will fall and converges to a more equal income distribution.

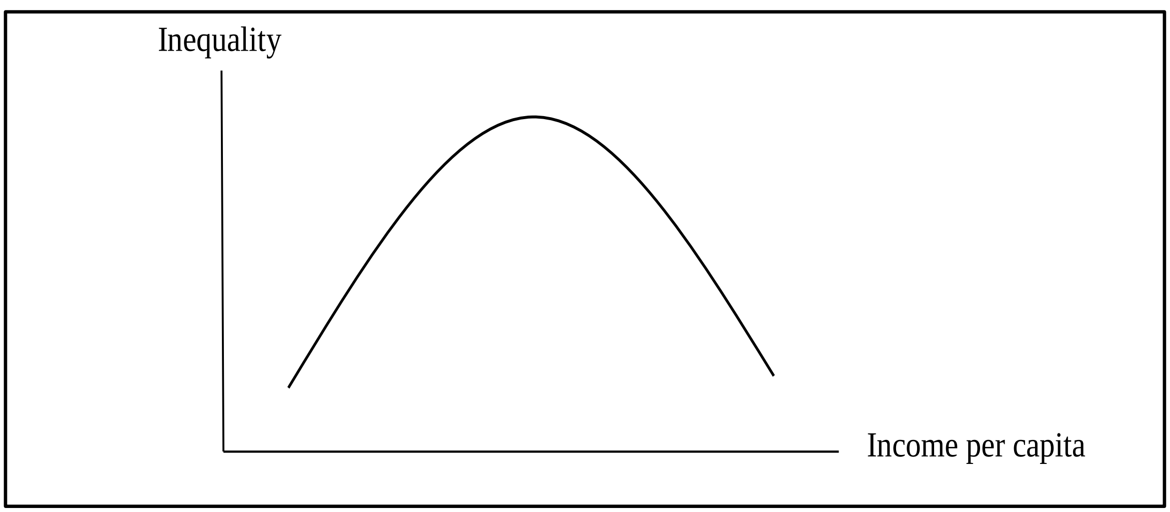

Figure 2.1: Hypothetical Kuznets' Curve

Figure 2.1 illustrates Kuznets' position on inequality-growth relationship. As a country moves up from being a low income country to a middle income country, as Malaysia did progressively in the 1990s, income distribution's equality may worsen, where unequal opportunities prevail. Further progress that pushes for a high income status, as what Malaysia is striving for, will improve income distribution. This hypothesis is found to be valid, as discovered by Zhou and Li (2011). Semiparametric estimation of panel data covering 75 countries among which includes Malaysia, testify to the hypothesis advanced by Simon Kuznets. Zhou and Li (2011) however, noted that the relationship will only hold if income level of the concerned country reaches a critical value. Robust Kuznets curve relationship may not be observed for countries with sub-threshold income level. On a different note, even at a theoretical level, there is ambiguity as to which variable causes which. Understanding this will have important policy implications, as per the aim of this paper to uncover.

Such a stand on inequality however has been dismissed by many, in the literature. Disputes on the viability of Kuznets' hypothesis stems from discrepancies in empirical studies. While it is true that some countries follow Kuznets' hypothesis, the relationship between development and inequality as proposed by Simon Kuznets breaks down for others. There is however, an alternative view that both provides new insight but does not discount in total, arguments of the Kuznets' curve. Analysing Kuznets' hypothesis in a Schumpeterian framework, Korzeniewicz and Moran (2005) raises the question whether the effects of inequality is similar across space and time. As the Kuznets' hypothesis was derived from observations made from the U.S., income inequality in Asia on the other hand, was noted by Korzeniewicz and Moran (2005) to not possess similar inequality dynamics as that of U.S., hence, putting the aforementioned hypothesis in scrutiny. Neoliberal theorists' stance on income inequality is such that increasing inequality promotes economic growth, implying a linear relationship. This is possible through imposition of lower tax rates on the upper end of income spectrum to encourage agents to work efficiently and gain reward. A low tax rate implies they get to retain most of the reward obtained from their activities. This encourages productivity and retains talents in the economy, as they will seek to maximise their return and work where it gives them the possibility of highest reward. This view too, has come under attack in the literature. Breen (1997) suggests modifications to the neoliberal model. By taking into account intergenerational advantage and mismatch between abilities and position, the author found that relationship between inequality and growth may not be linear. Policies that cause increase in inequality may therefore be rendered counterproductive. Another theoretical position that predicts a positive relationship between inequality and growth is offered by García-Peñalosa and Turnovsky (2005). Positivity of relationship forwarded by the authors however is an outcome, rather than cause of growth. The authors argue that initial capital endowments that are unequal will result in further inequality from structural changes that raise labour supply. Moreover the authors point out that the discrepancies in empirical evidence may stem from horizon of study. While negative relationship prevails in the long-run, short-run changes induce positive relationship between income inequality and output growth.

The literature also offers a demographic perspective on the relationship between income distribution and efficiency. Miyazawa (2006) for instance, examined the prospect of population aging, a phenomena faced by developed countries, affecting income distribution, between and within generations. With respect to intragenerational inequality, model used in the study postulates that aging population increases income inequality. Faced with an aging population, an economy's growth and inequality relationship is positive at an early stage, followed by negative connexion, given that the growth rate is hump-shaped. Another fascinating demographic view is offered by Croix and Doepke (2003). The authors connected efficiency and equity through differential fertility, i.e. difference in fertility between income earners on opposite ends of the income distribution spectrum. The argument is that poor families, tend to have more offspring, but invest relatively less than families that are more well-off, who also tend to have less progenies. Hence, even with population growth, economy does not necessarily grow in tandem, as it is in which community that a child is born in, more likely to determine whether the person will enrol as a productive workforce in the economy. Croix and Doepke (2003) went further by claiming through their model that with significant fertility differentials, a large income inequality negatively affects human capital growth rate, slamming the brakes on economic growth. Another theoretical discourse that incorporates human capital accumulation in explaining income inequality and growth is offered by Ray (2006). The author developed a model that describes interactions between growth and inequality, integrating accumulation of human capital, keeping credit constraints in check. The model developed posits that skill ratios which characterise income inequality within a generation will gradually converge to a steady state over time regardless of multiple initial conditions.

From an empirical point of view, there is a significant although small trade-off between equity and economic growth for the U.S. for the period 1960 to 1990 (Scully, 2003). Hence, a structural change that involves a transition in the U.S economy that heavily taxes its agents to one that does not tax as heavily is associated with minimal increase in income inequality. On the other hand, there is no strong relationship between inequality and growth in Guyana, a poor North African country (Gafar, 2004). These discrepancies in findings conform to arguments made by Korzeniewicz and Moran (2005) which state that trade-off between the two is space and time specific. A study that emphasises on space differential regarding income inequality is done by Shupp (2002). Using an endogenous growth model, the author found that the convergence rate of income level, i.e. reduction in inequality, for different regions in South Africa is lower than the implied rate given by previous models of neoclassical economics. This discrepancy arises from a fundamental conjecture of the model which states that there may be imperfect capital mobility across regions. This imperfection will obstruct capital transfers, thereby hindering factor employment to reach its optimum, which will ultimately hinder economic growth.

While China is one of the strongest emerging economies as of current date, empirical investigation into the relationship between growth and inequality seems inevitable. Qin et al. (2009) utilized micro level data in fitting a simulation model to investigate matter in question. The study found that, changes in income inequality negatively affects economic growth. The author also further acknowledged the importance of keeping inequality in check, as failure to do so will cause social instability, another path to obstruct optimal economic growth. Moreover, unequal income distribution has been among the most prevalent source of political and social backlash world over, which are in turn source of impediment to economic development. Evidence of negative association between inequality and economic growth is also found in transition economies of Central and Eastern Europe and Commonwealth of Independent States (Sukiassyan, 2007). Historically, conditions of the said economies were similar. As time progressed however, path of income inequality and economic growth of countries in the study diverged from each other. Sukiassyan (2007) found that for transition economies, the negativity of association between inequality and growth is particularly strong. As countries move from being centrally-planned to market oriented economies, effect of income inequality on growth amplifies. This may be the consequence of a weaker welfare distribution in laissez-faire system. The system encourages productivity and rewards individual effort, which may be beneficial to a certain extent. The inexistence of unequal opportunity however, may reduce effectiveness of such arrangement in the economy, causing it to be counter-productive instead.

Aforementioned arguments indicate that some sort of intervention is needed to reconcile efficiency and equity. Inevitably, the public sector needs to play its part in ensuring that economic growth is achieved, while keeping acceptable income distribution is in check. A conflict however lies in the observance of seemingly opposing objectives of equity and efficiency. To channel wealth from earners of the upper end of the income distribution spectrum to the lower end, government could impose high taxes on the rich.

This however, may seem punitive to high income earners, discouraging productivity. Ultimately, this will adversely affect growth. Muinelo-Gallo & Roca-Sagales (2011) examined such stance on a panel of 43 upper middle and high income countries. Expectedly, increasing taxes as means of income redistribution will indeed improve economic equity, but stifles economic growth. The authors found however, that such alternative fiscal tools as public investment through borrowing has the potential to reduce income inequality, while maintaining growth. Evidence of existence or inexistence of trade-off between inequality and growth is offered by Barro (2000). Low income countries observe trade-off between the said variables, hence, a reduction in inequality will promote growth. Rich countries on the other hand, observe positive relationship between inequality and growth, the reverse of a trade-off in the inequality-growth context, but a trade-off in the equity-growth context. Discretionary interpretations are warranted however, in Barro's (2000) findings. Bleaney and Nishiyama (2004) found that basing country income level in explaining cross-country differences in the inequality-growth nexus may not be a solid foundation. The authors found little evidence to support Barro's (2000) position, when empirical estimation is done using different growth models.

At this juncture, existence of trade-off between growth and income distribution is far from being an undisputable economic fact. In some economies, it is possible to achieve growth in tandem with promoting equality in income distribution. In a bid to provide further evidence on this matter, Atolia, Chatterjee, & Turnovsky (2012) studied the said behaviour. This was done by the trio, using productivity dynamics. Productivity increase could be achieved, either through gradual change or a rapid surge. The manner of which productivity level of a given country evolves, has significant implications on growth and inequality nexus (Atolia, et al., 2012). The authors found that incremental change in productivity level, results in the apparent trade-off between economic growth and income distribution in some countries. An abrupt surge on the other hand induces no trade-off. It is hence possible for countries, to nurture equality without foregoing growth objectives, by impelling rapid productivity growth.

Policy wise, income inequality indices in themselves are questionable. As Fields (2007) argued, inequality indices may rise if only one end of the income spectrum is evolving. In other words, low income earners may not be much worse off, but high income earners may have progressed in a way that such inequality index as the Gini to rise. This paper however argues that irrespective of the actual dynamics, equity should be considered when it comes to policy considerations.

2.2 Financial Development

Economic growth has long been identified to be related to financial development. This widespread notion in economic literature has spurred numerous researches investigating the finance-growth nexus for various countries and conditions. Theoretically, financial intermediaries facilitate economic growth through productivity and capital formation (Hao, 2006). With respect to productivity channel, financial intermediaries reduce risks for investors by being able to efficiently screen out bad credits from the good ones. Resultantly, transaction costs are minimized, fostering investment. In due course, this leads to rise in total factor productivity. Regarding capital formation channel, the effects on growth is ambiguous due to income and substitution effects. Enhancement of financial intermediaries' role in the economy may encourage savings, owing to higher returns. The same variable however, has the potential to reduce savings as agents may channel excess funds for other purposes.

Theoretical foundations discussed are echoed in the literature which suggests that advancement of the financial sector facilitate growth through improving resource allocation in the economy (D.-H. Kim, Lin, & Suen, 2012). Better allocation of production factors feeds activities that translate into efficiency. Literature also suggests that improvements in financial sector, will bring about improvements in such financial roles, as relaying information to savers and investors, allowing funds to be transferred from those who have surplus of funds to those with productive investment opportunities (Misati & Nyamongo, 2012). These financial intermediation roles are essential for smooth flow of funds in the economy, allowing it to achieve optimum growth. For instance, between the period 1980 and 2007, financial development in Latin American countries was found to significantly promote economic growth (Bittencourt, 2012). Increased accesses of means of financing and central bank independence have been cited by the author to be important dimensions of financial development in promoting growth. This is in concordance with theory, where better financing facilities enable factors to be employed efficiently which will drive economic growth. Hassan, Sanchez, and Yu (2011) confirm these findings by utilizing panel data. Financial development was found to be one of the essential factors for growth. The authors however cautioned that, financial development should not be taken as a defining factor, as real variables too have significant influence on economic growth.

Modern history has observed the rapid growth of emerging economies for the likes of China, India and Korea. These economies have also seen significant progress made in its financial sector. It is therefore viable to hypothesise financial intermediation's development is at the very least concomitant with economic growth of these countries. China's economic growth for instance, which has largely been a result of open policy and freeing up of resources, may also be underpinned by developments of its financial sector. Indeed, this is found to be the case in a study spanning from 1952 to 2001 (Liang & Teng, 2006). This supports theoretical view of financial sector's facilitative role in growth. Meanwhile, such financial aggregates as M2 and private credit provision is negatively associated with growth in Korea and Japan, and positively associated with growth in Taiwan (Liu & Hsu, 2006). The authors advocated that differing methods in financial sector policing may be the cause of discrepancies observed in the associative signs. This implies that not only progress and liberalisation of the sector, but governance of financial intermediaries play a pivotal role too when it comes to accommodative finance-growth relationships.

The discourse on financial development and growth involves causal directions. There is the finance-led growth hypothesis, where financial sector developments will facilitate economic activities through easing transactions and channelling funds. There is also the hypothesis that economic growth, will bring about progress in the financial sector, in order to accommodate a growing economy. A panel study conducted by Demetriades and Hussein (1996) found that causal linkages to differ from one country to another. The finance-led growth hypothesis is evident in Spain. Economic growth in Greece, Guatemala and Costa Rica on the other hand, causes developments of financial sector. There are even economies that exhibit bidirectional causality, one of which includes Thailand. Wang (2000) examined causal links between the two variables for Taiwan and found that developments in the exhibit country support finance-led growth hypothesis. Meanwhile, Ang and McKibbin (2007), examined interactions between financial liberalization and economic growth for Malaysia. Utilising cointegration and causality tests, the authors found that measures taken to liberalize the financial sector, will inevitably lead to financial deepening. At the same time, causality check confirms that economic growth will in turn lead to financial deepening in the long-run. This finding is in contrast to popular belief that it is financial development that leads to economic growth. Thus, Ang and McKibbin's (2007) findings suggest that (2007) financial liberalization alone does not lead to higher economic growth in the long-run. It merely expands that financial structure. Hence for the case of Malaysia, growth needs to lead the path, for financial deepening to follow.

Despite the fact that numerous empirical studies tend to favour financial development as a factor contributing to GDP growth, the relationship between the two may not be a stylized fact. As a few other researches may point out, nature of interactions between the two aforementioned variables may be country-specific. Nyamongo, Misati, Kipyegon, and Ndirangu (2012) for instance, examined relationship between remittances, financial progress and economic development for a host of 36 African countries. While remittances were found to be important determinant for growth for the said countries, advancements of the financial sector were found to have a positive, yet marginal effect of growth. This is so as the role of financial intermediation for African countries considered in the study is seen as a complement to a more significant factor, remittances. As noted by

Nyamongo et al. (2012), remittances inflow to African countries were substantial. Financial intermediaries were needed to channel these remittances to their home countries. Thus, instead of opposing factors, remittances and financial sector are complementary forces, in thrusting economic growth. The notion that finance-growth nexus are country specific is supported in another research done by Kar, Nazlıoğlu, and Ağır (2011). The authors applied panel causality test procedure as in Kónya (2006) on 15 Middle East and North African (MENA) countries. Findings made in the paper infer that growth and financial development is a relationship, that is country specific, i.e. differs depending on the country in question. Moreover, results of Seemingly Unrelated Regressions and Wald test reveal that by considering six measures of financial development, there seem to be no coherence in terms of causal relationship between economic growth and financial development. Hence, in addition to being country specific, Kar et al. (2011) found that causality between finance and growth are indicator specific. Financial development measured in monetary aggregates in Kuwait for instance, lead to economic growth, while domestic or private credit and banking variables do not. This is so because different proxies measure different aspects of financial development. Hence, one needs to take account of the particular role of intermediation that is being studied, in choosing proxies.

There have been several methods used in the literature in investigating finance-growth nexus. Zhang, Wang and Wang (2012) utilised city level data to examine interactions between financial development and economic growth. 286 cities in China were involved in the study. The authors employed conventional cross-sectional regression and first-differenced systems as well as a relatively more advanced generalized method of moments (GMM), following Levine, Loayza and Beck (2000). Unsurprisingly, Zhang et al. (2012) found that financial sector development promotes economic growth. More interestingly however, the authors found that results of GMM and conventional cross-sectional regression bared similar results. This implies that for China, it is viable to use a standard regression to study the finance-growth nexus. This conclusion however, should not be generalized as the finance-growth nexus for countries other than China may be a non-linear relationship, therefore requiring a different approach in terms of estimation. An advanced study which uses a prototype canonical model to evaluate relationships between growth, financial environment and income inequality was done by Townsend and Ueda (2006). The authors argue such a method is justified due to the fact that financial development in the country under study, Thailand, exhibits uneven financial deepening. Another empirical study was done on Saudi Arabia by Masih, Al-Elg, and Madani (2009). This particular paper, adopted rigorous statistical analysis in order to arrive to its conclusion on causality between the two variables. Having vector error correction and variance decomposition methods as the building blocks of its statistical analysis, the authors employed long-run structural modelling (LRSM), developed by Pesaran and Shin (2002). The model was used as it addressed limitations inherent in conventional cointegrating estimates in non-linear relationships (Masih, et al., 2009). Ang (2008) embarked on an in depth empirical study of financial development and growth for Malaysia. Autoregressive Distributed Lag (ARDL) test confirmed that OLS procedures yield consistent estimates for Malaysian data on financial variables. The author then proceeded with unrestricted error correction model (UECM) and dynamic ordinary least squares (DOLS) to obtain the long-run estimates.

Apart from the direct linkages between financial development and economic growth, Iyigun and Owen (2004) suggest that financial sector might be a variable in affecting the discrepancy in interactions between income inequality and economic development in high-income countries and low-income countries. The authors elucidated that as a country's financial structure improves, a more unequal income distribution induces greater volatility in GDP. Kim et al. (2012) employed panel data involving 69 countries in an attempt to offer a more rigorous analysis on the relationship between financial development, trade and economic growth. On the relationship between financial development and growth, the authors identified two measures of financial development namely Private Credit and Value Traded, indicating developments in banking or financial intermediation and stock market respectively. Generally, Kim et al. (2012) found that developments in financial intermediation impedes GDP growth while stock market developments propel economic growth, specifically for high-income, low-inflation and non-agricultural economies, which typically describes developed countries. For the case of Malaysia, Financial development is found to be linked to growth through domestic capital (Anwar & Sun, 2011). The direct effect on growth however, is found to be insignificant. Nevertheless effectively, financial intermediation plays a pivotal facilitative role in Malaysia's economic development. This could be enhanced by streamlining governments expenditure which will move favourably financial development in promoting output growth (Anwar & Sun, 2011). Campos, Karanasos and Tan (2012) on the other hand contended, that in countries where financial sector is far from developed, political instability may hinder growth. This stems from the fact that political stability affects the economy through various channels that have resistant adverse effects on economic development that inescapably impinge investors' confidence, no matter the progress being made in the financial sector. Such political instability need not take the form of riots and politicians' assassinations. All it need be are presence of frivolous and inconsistent policies stemming from political behaviour that concern the private sector.

2.3 Foreign Direct Investment

FDI has been a long standing factor contributing to economic growth, of which support is abundant in the literature. Discrepancies arise however, in terms of modelling, channel of which FDI affects growth and direction of causality between the two. FDI-growth nexus also differs depending on the country in investigation. Arguments made in the literature with respect to these issues are discussed in this section.

Investigating the effects of FDI inflows in developed and developing economies, Li and Liu (2005) utilized panel data consisting 84 countries. As expected, FDI and economic growth were found to be positively associated for both developed and developing countries. Interestingly however, the authors found that endogeneity between the two variables were present only form 1980s onwards. Prior to that period, there was no significant association. The study also cited that such intermediary variables as human capital and technology-absorption capabilities of domestic firms are essential for the FDI-growth nexus to hold. Choong (2011) extended the scientific inquiry on similar basis, using more recent data and analytical tools. GMM method employed indicated significant and positive relationship between FDI and economic growth for developed and developing countries. The study also reveals that presence of efficient financial sector is pivotal in promoting the FDI-growth nexus. Reliable financial system facilitates flow of funds from foreign investors to the concerned domestic sector so that FDI may be executed efficiently. Hence, financial sector development and FDI are complementary elements in stimulating output growth. Choong (2011) also noted that, instead of affecting economic growth through investment channel, FDI and financial sector primarily exert their influence on growth via efficiency channel. These studies seem to imply hence, that FDI is favourable economically, irrespective of income level and current stage of economic development of the recipient country. Extending on the debate of the channel that FDI affects growth, Yao and Wei (2007) investigated the matter for a newly industrialising economy (NIE) namely, China. China is an especially interesting case study for FDI investigation, as it only opened up to foreign investments in the 1980s, which is then followed by a consistently strong economic performance. It is found that FDI benefits growth on two fronts namely, it boosts production efficiency and it expands production capacity of China. These two channels provide an important pathway for emerging countries like China, to capitalise on foreign investments in order to achieve outstanding economic performance.

FDI has also been noted in the literature to have spillover effects on host countries which may be regional or industrial. Regional spillover can be further categorized into intra- and inter- regional. The channel of which intra-regional spillover operates are (i) increasing competition; (ii) worker mobility and (iii) demonstration effects (Hamida, 2012).

Hamida (2012) found that in Switzerland, firms reap the advantage of FDI given that the investment is made in the vicinity of which their firms locate and are subject to unfavourable effects if it is not: which illustrates intra-regional spillover. Particularly, the study found that low technological capable firms benefit from spillover mainly through worker mobility, while increasing competition benefits firms that are equipped with high technological capabilities and demonstration effects tends to largely benefit middle level firms of technological capabilities. For the case of inter-regional spillover, Ouyang and Fu (2012) investigates the matter for China. The study found that although FDI seems to be concentrated on coastal regions of China, inter-regional spillover effect extends to inland regions. This enhances productivity and growth, of neighbouring regions of the FDI recipient cities. The extent of significance of this phenomenon however, is contingent on absorptive capacity of the neighbouring cities. This is made apparent from the discrepancy regarding inter-regional spillover, where in Switzerland adverse inter-regional effects are observed, while in China, positive inter-regional effects prevail.

Apart from geographical dimensions, FDI has the potential to channel benefits to the industry that it is invested in. Foreign invested enterprises (FIEs) in China engage in high value added activities of which knowledge and expertise spillover on other firms in identical industries (Ito, Yashiro, Xu, Chen, & Wakasugi, 2012), thus the term intra-industry spillover effect. The same study found no evidence however, of inter-industry spillover. This may be due to the fact that spillover require firms to possess absorptive capacity (Crespo & Fontoura, 2007), i.e. the ability to adopt to new processes introduced through FDI. The low knowledge absorptive capacity of firms that operate in different industries, as they may require production processes are so dissimilar that technological progress are not communal, is a source inter-industry spillover insignificance. Firms in the same industry on the other hand, imitate and innovate on progress made by other firms relatively easily. Significant amount of investment made in R&D has been cited by Ito et al. (2012) to be central in this intra-industrial spillover. Lin, Liu, & Zhang (2009) extended China's FDI spillover scientific inquiry by segmenting firms into origins of FDI. Firms that receive FDIs from Hong Kong, Taiwan and Macau exert negative horizontal spillover, while firms that obtain FDIs from countries other than those mentioned earlier, particularly from Organisation for Economic Co-operation and Development (OECD) countries, generate positive spillover to other firms in identical industry.

Other forms of FDI spillover effects include vertical spillover, where benefits are shared among foreign associates on the up- and downstream firms of the production line. Particularly, in terms of FDI, firms in the host country, typically the suppliers receive significant gain from foreign investments (Havranek & Irsova, 2011). The meta analysis employed by Havranek and Irsova (2011) also found that open economies with a less than well-developed financial market greatly benefit from FDI. This is so because due to probably inefficient financial system, these countries depend on FDIs for funds that could be capitalized on. Note that this is contrast to findings made by Choong (2011) which indicates complementary roles in promoting economic growth. One reason for this may be the level of development of the financial sector its self. Building on findings of Azman-Saini, Law, & Ahmad (2010), this paper postulates that financial sector and FDI causality behaviour too, changes as the level of development reaches a certain threshold.

Additionally, economically significant spillover is accrued to host firms with technological state that are not excessively dissimilar to that of source country firms (Havranek & Irsova, 2011; Iršová & Havránek, 2012). Large technological disparity between source and host country dampens absorptive capacity of FDI firms in the receiving countries. This is so because if knowledge gap is too wide, receivers are more likely to imitate technology instead of absorbing knowledge that comes with FDI, due to insufficient skills and comprehension of higher knowledge.

Spillover exerts real effect on the economy. Knowledge transfers that result in improvements of production processes translate into higher total factor productivity (TFP), which essentially generates output growth. Greater the spillover, the greater the output growth is generated. Ahmed (2012) for instance, examined FDI's spillover effects on economic growth through input channels namely human capital, labour force and physical capital. The study found that absorptive capacity is positively associated with human capital and labour force, while a negative association is observed between absorptive capacity and physical capital.

Practically, there is a question on the causal direction between FDI and economic growth. Policy makers usually hinge their decisions on causality runs. Economic growth was found to cause changes in FDI, instead of the other way round for China (Mah, 2010). This finding however, is not to be generalized as a line of reasoning to infer on causality for countries other than China. As many articles in the literature argue, causality run differs according to countries. Hsiao and Hsiao (2006) for instance, examined causal linkages between FDI and economic growth for China, Taiwan, Singapore, Malaysia, Korea, Hong

Kong, Thailand and Philippines. Expectedly, causal direction runs from FDI to growth for some countries, and the reverse for the others. For instance, FDI granger causes growth for Singapore, growth granger causes FDI for China as in Mah (2010), while bidirectional causality prevails for Thailand. Panel data analysis of the same set of data however indicates that there seems to be a unidirectional causality that runs from FDI to economic growth for the sample countries. Effectively, Hsiao and Hsiao (2006) have demonstrated that generalizations achieved through panel data construction may not be robust as FDI and growth causality tend to influenced by country-specific country conditions. The discrepancies in causality runs among countries is also noted in another study done by Tekin (2012). Basing investigation on least developed countries, the study found that FDI granger causes GDP i.e. economic growth for Benin and Tongo, while the reverse for Gambia, Madagascar and Malawi. Income levels may be excessively divergent among the sample countries, but policies, bureaucracies and other considerations that affect private investments may differ, which lead to variances in causal relationships. Sridharan, Vijayakumar, and Rao (2009) conducted an FDI-growth causality study for the high achieving developing economies of Brazil, India, Russia, China and South Africa. The authors validated that FDI causes economic growth for India and China, while bidirectional causality prevails for Brazil, Russia and South Africa. This study yet again testifies to the fact that causality study needs to be country level, instead of resorting to an aggregation of panel studies.

Being a growth stricken region, where domestic investment is dismal, it would be reasonable to argue that FDI is crucial to the development of Sub-Saharan Africa. Adams

(2009) investigated the relationship between economic growth and direct investment inflows form other regions as well as domestic investments made in the region. Adopting OLS and fixed effect estimations, the study found a robust, positive and significant relationship between domestic investment and economic growth. On the other hand, FDI was found to exert significantly positive influence only under OLS estimation. The author hence argued that caution should be taken before positing the benefits of FDI on a country's economy. Rightfully, while some FDI inflows are beneficial, some could result in net crowding out effect. This is especially true for Sub-Saharan Africa countries where a significant portion of FDIs are made in primary sector. Inefficient regulation and uncompetitive markets are also cited as contributing factors (UNCTAD, 2007). Other studies, confront the widely accepted FDI-growth nexus in the literature more aggressively. Herzer, Klasen and Nowak-Lehmann D (2008) examined the notion of association between FDI and economic growth for 28 developing countries of Latin America, Asia and Africa. Generally, the authors concluded that there seems to be no strong evidence of FDI promoting economic growth. That is only 15 % of the sample countries included were found to be bound with FDI-growth relationship. 3.6 % of the countries with positive long-run influence of FDI, while in the short-run, 18 % of the sample exhibited significant relationship. The authors therefore argued that the FDI-growth nexus may not be as strong as the common belief in the literature. Gao (2005) offers another starkly different alternative view regarding the nexus in question. Instead of supporting the notion that GDP growth induces influx of FDI or the reverse for that matter, the author argued and demonstrated with a theoretical economic model that FDI and economic growth respond to economic integration. As factors of production and investments are able to cross regional borders more freely, FDI flows into the region with economic potential, boosting GDP growth. Region where FDI outflowed from the other hand, will observe liberation of factors into more efficient production, while also spurring economic growth.

2.4 Trade

The idea behind classical theories in explaining trade development stems on the argument that countries trade due to abundance in factor endowments and existence of comparative advantage in producing a particular good. Though this may seem adequate to explain trade pattern in the early days of modern trade, recent developments however constitute countries exporting goods of which require scarce resources and production processes that the exporting country does not possess comparative advantage in producing. Hence, classical trade theories though may still be germane in trade pattern on certain sectors of the world economy, other sectors were not sufficiently explained by these theories. Subsequent knowledge advancements however, have seen the rise of new trade theories and national competitive advantage, which are better able to explain trade behaviour in the modern world.

There is a tendency for firms to geographically concentrate production activities in a particular region, even though the region may not have comparative advantage in those activities. Trade impeding costs have been cited in the literature to contribute to this behaviour (Markusen & Venables, 2000). Given the benefit is outweighed by costs associated with trade, firms will agglomerate activities where achieving cost advantage is possible. This geographical agglomeration makes it possible for countries that are not leveraged in the traditional terms to participate in trade. Traditional trade theories also infer that nations trade in goods that are of different industries, in part to fulfil domestic demand. Empirical investigations however show that intra-industry trade (IIT) may take place in international markets. Such factors as product preference and economies of scale render this possible. From an importer’s point of view, preference for a particular good, makes it desirable to obtain it with lowest cost possible. Given that scale economies does not favour that particular nation, it is hence rational to import the product from a producing country that does. The effects of IIT on participating countries, particularly on labour market have been in debate. Some argue that opening up to IIT may lead to the demise of low skilled jobs, rendering wage rate of low-skilled workers to fall. Other studies, like that of Dluhosch’s (2006) on the other hand, argues that if foreign country possess abundant high-skilled labour, low-skilled workers in home country could benefit from the relocation of firms stemming from IIT.

The choice of which country firms locate their production processes, hence trade pattern they exhibit has consequence on economic growth. To the extent that a country fall out of participation of current trade pattern such as IIT, one could argue that lower growth rate is in order. Trade pattern and growth relationship is examined by Kaneko (2000). So long as pre-trade prices differ from world market price, a small open economy will completely specialise in the production of goods that it is efficient in producing, making the country possible to participate in IIT. Moreover, Kaneko (2000) argued that terms of trade has no significant impact on an economy’s growth if it specialises mainly in capital commodities which are primarily used for investments. If the country specialises on consumption goods on the other hand, terms of trade is posited to significantly affect growth.

There is then the opposing trend of specialisation and trade in homogenous goods in a relatively perfectly competitive market and specialisation in differentiated goods in monopolistically competitive markets. Ihart and Trionfetti (2009) attempted to elucidate this trend through appreciation of home biased criteria of domestic demand. The study found statistically robust home biased demand effect on specialisation in differentiated goods in a monopolistic market, but insufficient empirical evidence to arrive at similar inference for homogenous goods. An explanation is in order. Production of differentiated goods in a non-perfectly competitive market faces minimal competition. Producers are then able to obtain a price that is higher than marginal costs. This monopolistic structure is compounded by home biased demand, partly owing to insufficient choice faced by consumers in such a market. Hence, it is sensible from the producers' point of view, to specialize in production of goods with these characteristics, explaining the significance of home biased effect in monopolistically competitive market.

Though trade and economic growth theories' developments in the literature are well-grounded, progress were almost exclusive of each other. While empirically, there have been numerous studies that established statistical relationship between the two. There is then prominence to theoretically reconcile trade and economic growth. One such attempt is made by Chatterjee & Shukayev (2012). Basing arguments on a dynamic Heckscher-Ohlin model, the authors render it possible that countries specialise in production of goods, and diversify specialisation in face of uncertainty. This is contrast with a deterministic model where a country specialises indefinitely.

Another revolutionary theoretical proposition that is concerned on trade and economic growth connexion is offered by Baldwin and Forslid (2000), by employing Tobin's q theory. The theory suggests two channels of which trade may positively affect growth. The first is through procompetitive effect where trade liberalisation leads to competition in the market for a given good, owing to a larger access for consumers. This will result in lower mark-up costs, and reduce capital replacement costs. These cost reductions will inevitably give rise to greater capital accumulation. The second channel operates via imperfect market of financial intermediation. The said market structure in financial services results in lower equilibrium interest rates, which translates into lower borrowing costs. These mechanisms work bodes well for producers, whom will introduce new capital more readily. As Tobin's q theory goes, greater capital generation, which is the result of the aforementioned two channels as suggested by Baldwin and Forslid (2000), leads to greater economic growth.

Evidence of positive association between growth and trade is offered by Onafowora and Owoye (1998), with a study on 12 sub-Saharan African countries. 10 of the sample countries observed significant positive long-run relationship between trade and growth. This is expected as the countries in study are characterised with limited factor endowments. Bolivia, another poor south American country is found to exhibit long-run equilibrium between trade and growth (Bojanic, 2012). Hence, even upon conjuring traditional trade theories, positive association between the two are projected. Pakistan on the other hand however, is resource abundant. Thus, traditional theory may posit that the country's participation in world trade is marginal. Nevertheless, Shahbaz (2012) confirms long-run relationship between trade and growth exists for Pakistan. The channel of which trade benefits Pakistan however, may differ than that of sub-Saharan African countries and Bolivia as discussed earlier. That is, gains are more likely to operate through freeing up of resources into more efficient production processes rather than expansion of consumption possibility frontier. E. Kim (2000) provides empirical support for the argument of productivity channel for trade in promoting growth. Utilising Korean manufacturing firm-level data, the study showed that liberalisation of trade leads to increasing competition, hence improvements in productivity and scale efficiency. Additionally, E. Kim (2000) proved that quota restrictions to be more detrimental as opposed to price measures. Yanikkaya (2003) lent empirical support for the positive relationship between growth and trade though a study done on U.S. and OECD countries, noting such channels as share of technology, scale economies and comparative advantage as possible sources of growth. Additionally, the study showed that the positivity is insensitive to empirical estimation employed which includes OLS, SUR and 3SLS proving robustness of the relationship.

The manufacturing sector is probably one of the most protected when it comes to globalisation. This is due to stifling competition faced by manufacturers, especially in a small economy like Malaysia, against manufacturers from large economies such as U.S. and China which are more able to achieve scale economies. A sector-specific empirical study on the other hand found that trade liberalisation promotes growth of Malaysia's manufacturing sector (Chandran & Munusamy, 2009). This is due to the fact that many of

Malaysia's exports are essential components in the E&E industry. This is in line with vertical specialisation trade as discussed by Hummels, Ishii, & Yi (2001) of which study found evidence of vertical specialisation which constitute importing goods that are used in manufacturing of components, that are in turn exported either as final product or input in another production stage. The authors noted that over the course of over 20 years since 1970, vertical specialisation grew significantly, as a proportion to trade. This vertical specialisation trend observed encourages manufacturing sector's development, hence stimulates output growth in the long-run. Other sectors of the economy, such as the services sector should not be neglected, as it too has the potential to contribute to growth. Duly so, El Khoury and Savvides (2006) conducted an empirical investigation on this matter, focussing on telecommunications and financial services. The authors found a threshold level of income to be existent for the effects of the studied services to materialise. Low income countries exhibit positive relationship between trade in telecommunications and growth, while high income countries showed evidence of positivity between trade in financial services and economic growth.

At this juncture, positive association between trade and growth is seen as statistically and geographically robust. It remains however, the question of extent of which trade may speed economic growth. Lee (2011) found that the technology coupled with production of goods that an economy specialises matters. Specifically, if a country specialises in production which entails high technologically composed goods, growth rate is faster than that of an economy which specialises in low technologically manufactured goods. In terms of policy formulation therefore, it would be sensible to encourage specialisation in high-technology products. Care should be taken however, that it does not distort resources away from efficient production processes.

Knowing the nature and extent of relationship between trade and growth is imperative. Additionally in policy formulation however, knowledge of the direction of causal linkages would be prolific. A panel data granger causality study was done on OECD countries by Kónya (2006). Unidirectional causality from exports to growth was found to be existent for some countries such as Belgium, Denmark and Ireland, whereas the reverse was found for Austria, France and Japan. Bidirectionality was also found Canada and Netherlands. While no causal linkages were existent for Korea, U.K and U.S. Exports and import were found to cause economic growth for Czech republic, bidirectional causality between exports and growth for Bulgaria and unidirectional causality from imports to growth for Poland (Awokuse, 2007). Meanwhile, Lean and Smyth (2010) failed to find empirical support for causal linkages between trade and growth for Malaysia. These findings indicate that causality runs are country-specific and there is a need to address them individually, to obtain valid results.

Empirical methods employed in the literature to assess trade-growth nexus are numerous. A non-parametric local linear kernel estimation of various provinces in China was conducted by Chen and Dong (2012). The authors found a positive relationship between export and import with trade. The employed empirical procedure was said to overcome short comings of parametric estimations, one of which include inability to handle multicollinearity among explanatory variables efficiently. Berg (1997) on the other hand adopted simultaneous regression method on Mexico's time series data to rectify inconclusiveness of previous studies on the particular country. The study confirmed a positive relationship between trade and economic growth for Mexico. The author reasoned that vagueness of previous studies were in part may be due to method employed, but maintained that Mexico's trade policies, which constitute strong import substitution tenor to also be held responsible.

2.5 Conclusion

This chapter has discussed relevant theoretical and empirical discourse in the literature on income inequality, financial development, FDI and trade. Emphasis on economic growth is made on all dimensions of explanatories included in this study. As such, theoretical positions, statistical methods and arguments made throughout this paper are derived from valuable insights gained in this chapter.

3 METHODOLOGY

This chapter outlines theoretical basis of the research as well as key tools and procedures utilised in this paper to achieve its goals. Discussions are tailored to the framework adopted by the author.

3.1 Conceptual Framework

Before embarking on the operational procedures, it would be useful to construct a conceptual framework, so as to have a solid base of reference. This ensures that this research does not diverge from its goals.

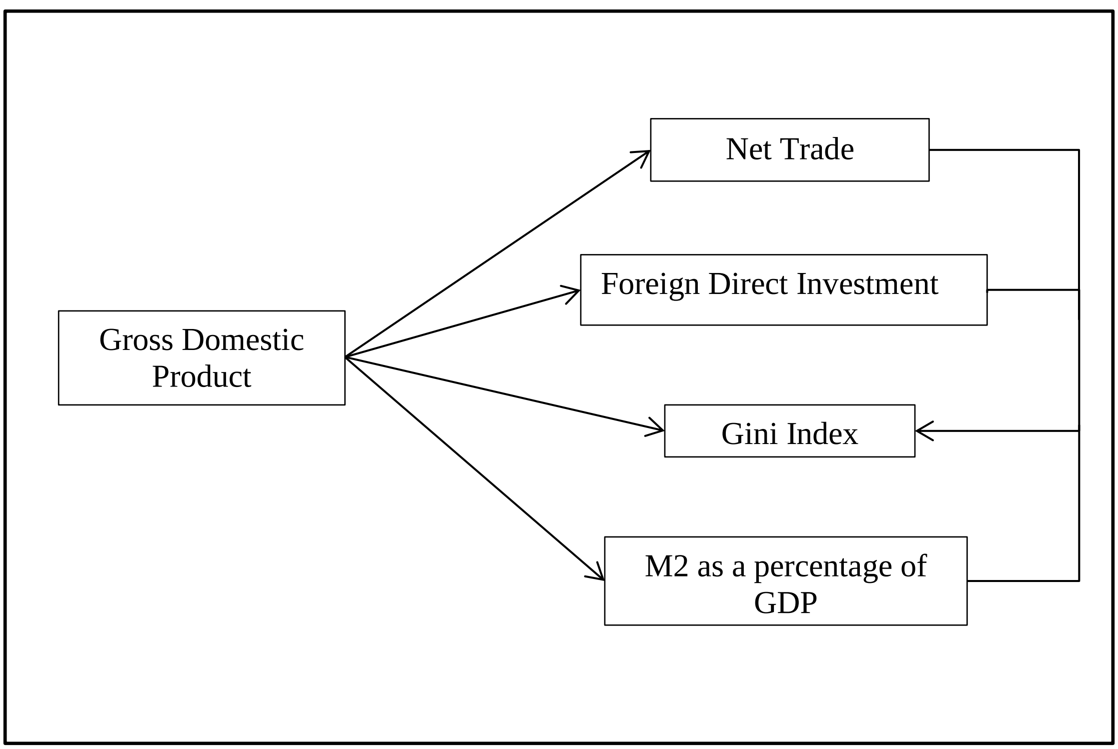

Figure 3.1: Conceptual Framework

Figure 3.1 depicts the diagrammatical representation of the concepts involved in this paper. As has been established earlier on, this paper seeks to examine the influence of income inequality, financial development, foreign direct investment and trade on economic growth. This is represented by the arrows that run from Gini index, M2 as a percentage of GDP, FDI and net trade to GDP which act as variables for income inequality, financial development, foreign direct investment and trade respectively.

Note that the arrows run both ways between the explanatory variables on the right hand side and GDP. This is to capture feedback effect from explanatory variables, in other words, causal links. Additionally, this paper attempts to investigate the causal linkages among explanatory variables. The diagrammatical representation of this is omitted for simplicity. The effects of trade, FDI, and financial development in influencing income inequality-growth relationship will also be investigated, of which relationship is represented by the arrows that run from M2 as a percentage of GDP, FDI and net trade to GDP via Gini index.

3.2 Theoretical Model and Hypotheses

Theoretical underpinnings with regard to the relationship between income inequality and financial development with growth is derived from Nishi (2012). Hypotheses constructions are based on framework derived from the paper.

The model developed consists of four agents namely workers, firms, banks and investors. Workers are employed as factor of productions by firms, which obtain financing from investors via banks. The effective level of employment is denoted by L, wage paid to workers by W and net operating revenues that firms receive by R. Given that the economy produces X output and the prevailing price level is P, the distribution of income is therefore described by the function:

$$PX = WL + R \tag{3.1}$$

Acknowledging the role of institutional arrangements in intermediating funds from savers to borrowers, the firms may obtain funds through loans. The total amount of loans i.e. debt held by firms is denoted by D. Consider that the market-clearing interest rate is given by i, the amount payable by firms to service debts is therefore given by iD. The firms may also issue shares, of which are also financed by investors. Dividends paid on the shares is a portion of net profit, which is net operating revenues less interest payments on loans, R-iD. Given that firms retain some of their profits, which is denoted by S_F, the portion devoted to dividend payments is therefore 1-S_F. Hence income function for investors, who receive dividend payments and interest on loans, is given by $(1\text{-}S_F)(R\text{-}iD) + iD$. The total savings rate in the economy is therefore composed of savings made by firms, S_F and investors which is given by S_I. Specifically:

$$\mathrm{S} = S_I + \mathrm{S_F} \tag{3.2}$$

The savings-capital ratio is then given by:

$$\frac{S}{K} = \frac{S_I + \mathrm{S_F}}{K} \tag{3.3}$$

Note that investors save a portion of their income, which has been determined to be (1-S_F)(R-iD) + iD. Additionally, since firms too, save a fraction of their income which is given by R-iD, (3.3) becomes:

$$\frac{S}{K} = \frac{S_I[(1-S_F)(\,R-iD) + iD] + \mathrm{S_F}(R-iD)}{K}, \tag{3.4}$$

Net operating revenue, R is the product of profit share, π and amount of output produced, X. Thus:

$$\frac{S}{K} = \frac{S_I[(1-S_F)(\,\pi X-iD) + iD] + \mathrm{S_F}(\pi X-iD)}{K}, \tag{3.5}$$

Letting $u = \frac{X}{K}$ and $\lambda = \frac{D}{K}$, we have:

$$\frac{S}{K} = S_I[(1-S_F)(\,\pi u - i\lambda) + \ i\lambda] + \mathrm{S_F}(\pi u - i\lambda), \tag{3.6}$$

Expansions and manipulation gives:

$$\frac{S}{K} = [S_F(1-S_I) + S_I]\pi u - S_F(1-S_I)i\lambda, \tag{3.7}$$

Letting $\Delta = S_F(1 - S_I)$, yields:

$$\frac{S}{K} = (\Delta + \mathrm{S_I})\pi u - \Delta i\lambda. \tag{3.8}$$

Having derived the savings function, it would now be viable to define investment function. Again, following Nishi (2012), desired investment is given by:

$$g = \frac{I}{K}$$

$$g = \alpha + \beta\pi + \gamma u - \theta i\lambda, \tag{3.9}$$

$$\alpha > 0,\ \beta > 0,\ \gamma > 0,\ \theta > 0$$

Note that: $\frac{\partial g}{\partial \pi} > 0$, $\frac{\partial g}{\partial u} > 0$ and $\frac{\partial g}{\partial \lambda} < 0$. In other words, profit share and capacity utilization rate exert positive influence on capital accumulation rate, g while debt service is negatively associated with g. Conventionally, to obtain equilibrium condition where savings equal investments, in this model, savings-capital ratio is equated to investment-capital ratio.

$$\frac{S}{K} = \frac{I}{K}$$

$$(\Delta + \mathrm{S_I})\pi u - \Delta i\lambda = \alpha + \beta\pi + \gamma u - \theta i\lambda, \tag{3.10}$$

Rearrangement yields:

$$u^* = \frac{\alpha+\beta\pi+(\Delta-\theta)i\lambda}{(\lambda+S_I)\pi-\theta}. \tag{3.11}$$

Recall that u^* denotes capital-output ratio, alternatively capacity utilization ratio in equilibrium. In assuring a positive equilibrium value, numerator is assumed positive. Moreover, denominator is also positive, complying to Keynesian stability condition. Substituting this equilibrium value into g:

$$g^* = \alpha + \beta\pi + \gamma\frac{\alpha+\beta\pi+(\Delta-\theta)i\lambda}{(\lambda+S_I)\pi-\theta} - \theta i\lambda, \tag{3.12}$$

Rearrangement and manipulation gives:

$$g^* = \frac{(\alpha+\beta\pi)(\Delta+S_I)\pi+[\Delta\gamma-\theta\pi(\Delta+S_I)]i\lambda}{(\Delta+S_I)\pi-\gamma}. \tag{3.13}$$

Assuming a constant capacity utilization, g^* is also the output growth rate. Now that the model has arrived at the function that describes output growth rate, note that is possible to derive the qualitative effect of income distribution and financial structure on growth. To assess income distribution's effect on growth, partial derivative on g^* function with respect to π is performed:

$$\frac{\partial g^*}{\partial \pi} = \frac{\Delta + S_I}{[(\Delta + S_I)\pi - \gamma]^2}\{\beta\pi^2(\Delta + S_I) - \gamma[\alpha + 2\beta\pi + (\Delta - \theta)i\lambda]\}. \tag{3.14}$$

It has been established earlier that the function of u^* is positive. Hence, $[\alpha + 2\beta\pi + (\Delta - \theta)i\lambda]$ follows this condition. The value of $\frac{\partial g^*}{\partial \pi}$ therefore, depends on other parameters in the bracket of the numerator. Nishi (2012) allowed flexibility on the value of parameters to distinguish between wage-led and profit-led regime. For the purpose of fitting the model into the framework of this paper however a restrictive condition is imposed, that is:

$$\gamma[\alpha + 2\beta\pi + (\Delta - \theta)i\lambda] > \beta\pi^2(\Delta + S_I), \tag{3.15}$$

So that:

$$\frac{\partial g^*}{\partial \pi} < 0.$$

Therefore, it is hypothesised that increment in profit share enjoyed by firms, reduces income distribution equity, reducing economic growth. Put differently, increment in income inequality is expected to have negative consequence on economic growth, implying an efficiency-equity non-trade-off.

Note that the model is formalised in a way such that presence of financial intermediaries is not represented explicitly. Instead, effects of financial development may be assessed through debt-capital ratio, λ, which is a proxy for financial development. Taking partial derivatives on g^* function with respect to λ:

$$\frac{\partial g^*}{\partial \lambda} = \frac{\gamma\Delta i - \Delta\theta\pi i - \theta\pi S_I i}{(\Delta + S_I)\pi - \gamma}$$

$$= \frac{i}{(\Delta+S_I)\pi-\gamma}[\gamma\Delta - \theta(\Delta + S_I)\pi] \tag{3.16}$$

Acknowledging that financial intermediation role of transferring funds from savers to borrowers is in line with debt-capital ratio evolution, the following restriction is imposed:

$$\gamma\Delta > \theta(\Delta + S_I)\pi, \tag{3.17}$$

So that,

$$\frac{\partial g^*}{\partial \lambda} > 0.$$

A positive association between financial development and growth is then hypothesised.

With regards to FDI and growth, a simple Cobb-Douglas production function may be employed (Bengoa & Sanchez-Robles). Given that domestic capital is denoted by K and inflow of FDI supplies intermediate goods that are denoted by $x_{i,}$ the production function may be represented as:

$$Y_t = AK^{\alpha^{[\sum_{i=1}^{N_t,FDI} x_{it}^{\beta}]^{1-\alpha}}}$$

$$= AK^{\alpha^{(N_{FDI}x_i^{\beta})^{1-\alpha}}}. \tag{3.18}$$

This characterisation of production function implies that output is produced using domestic capital, compounded by FDI capital accumulation. To assess its implications on economic growth, a partial derivative with respect to N_{FDI} is performed.

$$\frac{\partial Y}{\partial N_{FDI}} = (1-\alpha)AK^{\alpha^{(N_{FDI}x_i^{\beta})^{-\alpha}}} x_i^{\beta} \tag{3.19}$$

The expression for $\frac{\partial Y}{\partial N_{FDI}}$ is unambiguously positive. Therefore, it is expected that FDI inflows will generate output growth.

3.3 Data

Significant portion of data are gathered from World Bank's databases. World Bank's World Development Indicators (WDI) provides development indicators which are in turn gathered from internationally established and officially endorsed sources. Data for Net trade in goods and services is a combination between WDI's and that of Department of Statistics Malaysia. Gini index are gathered from Post Enumeration Survey of 1970 Population and Housing Census (1970), Household Income Surveys and Economic Planning Unit's data compilation. The entire series for GDP, FDI and M2 are obtained from WDI. Note that nominal values are in US$, as reported in WDI. All nominal data have been discounted to real terms, taking 2005 as base year. The time dimension of data used spans from 1970 to 2011.

3.3.1 Treatment of GINI indices

This paper employs a simple interpolation technique on Gini indices. This is done as the number of data available for this particular variable is limited. OLS and other useful analytical procedures require extensive data availability for the analysis to bear meaningful results. Common interpolation methods at disposal include linear interpolation, log-linear interpolation, Catmull-Rom Spline interpolation and Cardinal Spline interpolation.

Log linear interpolation uses immediate available data to predict missing values. Log-linear uses the same method; however the values undergo logarithmic transformation prior to generation of missing values. Effectively, the generated data will be similar to that of linear interpolation, with a smoother trace line. Catmull-Rom Spline and Cardinal Spline interpolation on the other hand, uses several data closest to the missing observation to generate interpolated values. Moreover, computation of interpolated values generates a curved data trace line.

At certain intervals of Gini indices, there are two or three missing data points before each available observation. Hence interpolated values may be generated with false underlying assumptions under Catmull-Rom Spline and Cardinal Spline interpolation. Since Gini indices do not vary much over the years and on the basis of having a smooth-like generated data, this paper employs log-linear interpolation technique. Specifically, the interpolation takes the following form:

$$GINI_{interpolate} = EXP[(1-\lambda)\log(GINI_{t-1}) + \lambda \log(GINI_{t+1})] \qquad (3.20)$$

Where $GINI_{interpolate}$ is the generated observation of interpolation, λ is the ratio of missing value position and the total missing values in a given row, $GINI_{t-1}$ is preceding non-missing observation and $GINI_{t+1}$ is the following non-missing observation.

3.4 Analytical Tools

This section introduces some commonly used statistical measures in describing empirical models.

3.4.1 Akaike Information Criterion (AIC)

Akaike (1973) has developed a method to determine the maximum likelihood in Gaussian autoregressive moving average models. The extensive statistical reasoning in his articles has lent a useful applicable tool for economists. The AIC is by no means a method to develop model, it is merely a statistical criteria that economists use to select the “best” model among a given set of models. Generally, AIC is given by:

$$AIC = 2k - 2\ln(L) \qquad (3.21)$$

Where:

k = number of parameters

L = maximum value of likelihood function of the model specified

For the purpose of this paper, a few models with different specifications will be estimated. Selection of the 'best' model will rely on values of AIC.

3.4.2 Coefficient of Correlation, r

The correlation coefficient measures the direction and strength of linear relationship between two variables. This coefficient of correlation may take any values from +1 to -1. For instance, an r value of +1, implies that the two concerned variables are perfectly and positively correlated. A value of -1 on the other hand, implies the two concerned variables are perfectly and negatively correlated. In practice however, the value of r is usually between the two extremes.

3.4.3 Coefficient of Determination, R^2

Coefficient of Determination is a measure of fit of a given regression equation. Often referred to as the "goodness of fit" measure, R^2 measures the percentage of variation of the dependent variable around its mean, which could be explained by the regression equation. It could be expressed as the ratio of explained sum of squares (ESS) to total sum of squares (TSS).

$$R^2 = \frac{\mathrm{ESS}}{\mathrm{TSS}} = 1 - \frac{\mathrm{RSS}}{\mathrm{TSS}} = 1 - \frac{\sum e_i^2}{\sum (Y_i - \bar{Y})} \qquad (3.22)$$

Since ESS and TSS are always positive because they are squared terms, and it must be the case that ESS is less than total sum of squares (TSS), therefore the value of R^2 will always lie in the interval:

$$0 < R^2 < 1$$

An R^2 value of one will mean that 100 percent of variations in the dependent variable could be explained by the independent variables included in the regression equation. At the other extreme, R^2 value of nil would mean that none of the variations in the dependent variable could be explained by the independent variables included in the regression equation. Note that however, these two cases are rare in economic studies. In some cases, an R^2 value of 0.5 is deemed as a good model.

3.4.4 Adjusted R^2, $\bar{R}^2$

$\bar{R}^2$ measures the percentage change in explained variable that is explained by the explanatory variables included in the regression model, adjusted for degrees of freedom. Statisticians came up with this measure due to a flaw in the R^2. Adding more independent variables in the regression equation will increase its value even though the variable does not result in improvement of fit in the model. Value of $\bar{R}^2$ on the other hand, will only increase if the addition of another explanatory variable results in improvement of fit in the regression equation. Similar to R^2, value of 1 indicates that variations in the dependent variable could be fully explained by the model. $\bar{R}^2$ could however be slightly negative if the value of R^2 is extremely low. $\bar{R}^2$ may be derived by the following equation:

$$\bar{R}^2 = 1 - \frac{\sum e_i^2/(N-K-1)}{\sum(Y_i - \bar{Y})^2/(N-1)} \tag{3.22}$$

3.4.5 t- test

t- test is used to test the statistical significance of each explanatory variables in the regression model. The underlying hypotheses for t-test are set as follows:

Null Hypothesis, H_0 : $\beta_k = 0$

Alternative Hypothesis, H_1 : $\beta_k \neq 0$

In this paper, the $\rho - value$ approach is used in determining the significance of a given variable. To use this approach, the researcher will before hand determine the level of significance. A significance level of 5 percent or 0.05 in terms of probability, implies that the research outcome may be true 95 percent of the time.

The obtained $\rho - value$ given by statistical software is to be compared to the chosen level of significance in order to determine whether the variable is significant in explaining variations in the explained variable. Referring to the hypotheses specified above, the null hypothesis is rejected if probability value of the variable, $\rho - value$ is less than the significance level chosen by the researcher, α.

Since if $\rho < \alpha$, null hypothesis is rejected, the given variable would hence be deemed significant in explaining variations in the dependent variable.

3.4.6 F- test or ANOVA Test

ANOVA test otherwise referred to as F-test is a statistical test to measure the collective statistical significance of a group of variables in a regression equation. The idea is similar to t-test, but modified to test for the significance for a set of variables in the regression equation. This is due to the fact that many economic phenomenon require the researcher to collectively study the effect of few variables. The underlying hypothesis for ANOVA test is defined as follows:

Null Hypothesis, H_0 : $\beta_1 = \beta_2 = \beta_3 = \ldots = \beta_k = 0$

Alternative Hypothesis, H_1 : H_0 is not true

Similarly, $\rho - value$ approach could be used in determining the collective significance of a given set of variables. Say the given probability generated by statistical software is ρ and the chosen level of significance is α. Consider that $\rho < \alpha$, thus null hypothesis is rejected, hence at least one of the independent variables is significant in explaining variations in the dependent variable, proving the collective significance of the chosen set of variables.

3.5 Data Analysis Procedures

This section lays out the analytical methods used in this study. Since this is an empirical paper, statistical methods are used extensively.

3.5.1 Unit Root Test

Series that fluctuate a round a constant mean is termed stationary series. However, this is usually not the case for economic data. Often, the variables exhibit certain trends, *FDI*, *GINI*, *NT*, *M2* and *GDP* are no exemption. So to test for stationarity, Dickey-Fuller (DF) test is employed. To illustrate DF test, consider the following equation:

$$\Delta GDP_t = \delta GDP_{t-1} + u_t \tag{3.23}$$

The null hypothesis is set as $\delta = 0$ and the alternative hypothesis is set as $\delta < 0$. If null hypothesis is rejected, then GDP is said to be stationary and hence no unit root in the series.

Alternatively, if null hypothesis is not rejected, the series is said to be non-stationary and therefore, there is unit root. Note that the equation above has no constant and trend. Equations for testing stationarity with constant and trend are as follow:

$$\text{With constant: } \Delta GDP_t = \alpha + \delta GDP_{t-1} + u_t \tag{3.24}$$

$$\text{With constant and trend: } \Delta GDP_t = \alpha + \beta t + \delta GDP_{t-1} + u_t \tag{3.25}$$

However note that for DF test to hold, the series need to be free of serial correlation. If the residuals are correlated however, augmented Dickey-Fuller (ADF) test is employed.

This can be done by adding the lagged values of dependent variable in DF test as one of the explanatory variables.

$$\text{Without constant and trend: } \Delta GDP_t = \delta GDP_{t-1} + \sum_{i=1}^{p} \lambda_i GDP_{t-i} + u_t \quad (3.26)$$

$$\text{With constant: } \Delta GDP_t = \alpha + \delta GDP_{t-1} + \sum_{i=1}^{p} \lambda_i GDP_{t-i} + u_t \quad (3.27)$$

$$\text{With constant and trend: } \Delta GDP_t = \alpha + \beta t + \delta GDP_{t-1} + \sum_{i=1}^{p} \lambda_i GDP_{t-i} + u_t \quad (3.28)$$

The optimal number of lags to be included in the equation could be achieved by estimating a set of equations and choosing the one that yields the lowest AIC value.

If it is found that the series are not stationary, the first differences of them are taken and ADF test of the first differenced series are performed. If the series are found to be stationary, then they are said to be stationary at first difference or integrated at order one, *I*(1). If they are stationary at second differences, it is said that the series are integrated at order two, *I*(2). Most economic series are in fact *I*(1).Similar procedures are applied to test for stationarity on *GINI*, *M2*, *FDI* and *NT*.

3.5.2 Multivariate Regression Analysis

In this research, multivariate regression analysis is used to explain the influence of specified independent variables on growth. Specifically, OLS method is used, to arrive to the coefficient estimates for each regressors included in the model. The general model that is to be estimated is:

$$GDP = f(GINI, M2, FDI, NT) \tag{3.29}$$

Where:

GDP = Gross Domestic Product

GINI = Gini index

M2 = M2 as a percentage of GDP

FDI = Foreign Direct Investment Inflow

NT = Net Trade in Goods and Services

The expected value of GDP with respect to values given by the independent variables is:

$$E[GDP|GINI, M2, FDI, NT] = f(GINI, M2, FDI, NT), \tag{3.30}$$

In other words, GDP is expected to be a linear function of the regressors. Hence, the following regression function may be estimated:

$$GDP_t = \beta_0 + \beta_1 GINI_t + \beta_2\, M2_t + \beta_3\, FDI_t + \beta_4\, NT_t + \mu_t \tag{3.31}$$

The sample regression function is hence:

$$\widehat{GDP}_t = \hat{\beta}_0 + \hat{\beta}_1 GINI_t + \hat{\beta}_2 M2_t + \hat{\beta}_3\, FDI_t + \hat{\beta}_4 NT_t \tag{3.32}$$

Residual term of the regression, u_t is the difference between the true underlying regression line and the estimated regression line, which is given by:

$$\hat{u}_t = Y_t - \hat{Y}_t$$

$$\hat{u}_t = GDP_t - \hat{\beta}_0 + \hat{\beta}_1 GINI_t + \hat{\beta}_2 M2_t + \hat{\beta}_3\, FDI_t + \hat{\beta}_4 NT_t \qquad (3.33)$$

Taking the sum squared of this difference $\forall t$;

$$\sum_{t=1}^{n} \hat{u}_t^2 = \sum_{t=1}^{n} (GDP_t - \hat{\beta}_0 + \hat{\beta}_1 GINI_t + \hat{\beta}_2 M2_t + \hat{\beta}_3\, FDI_t + \hat{\beta}_4 NT_t)^2. \quad (3.34)$$

OLS estimation operates such that it minimises (3.34). Specifying vectors:

$$\boldsymbol{X} = \begin{bmatrix} GINI_1 & M2_1 & FDI_1 & NT_1 \\ GINI_2 & M2_2 & FDI_2 & NT_2 \\ \vdots & \vdots & \vdots & \vdots \\ GINI_n & M2_n & FDI_n & NT_n \end{bmatrix}$$

$$\boldsymbol{GDP} = \begin{bmatrix} GDP_1 \\ GDP_2 \\ \vdots \\ GDP_n \end{bmatrix}$$

(3.34) is then reduced to:

$$\sum_{t=1}^{n} \hat{\boldsymbol{u}}_t^2 = (\boldsymbol{GDP} - \boldsymbol{X\beta})^2 \qquad (3.35)$$

Expansion gives:

$$\sum_{t=1}^{n} \widehat{\boldsymbol{u}}_t^2 = (\boldsymbol{GDP} - \boldsymbol{X\beta})'(\boldsymbol{GDP} - \boldsymbol{X\beta})$$

$$= \boldsymbol{GDP'GDP} - \boldsymbol{GDP'X\beta} - \boldsymbol{GDPX'\beta'} + \boldsymbol{X'\beta'X\beta} \qquad (3.36)$$

Since $\beta'X'GDP = (\beta'X'GDP)' = GDP'X\beta$:

$$\textstyle\sum_{t=1}^{n} \widehat{\boldsymbol{u}}_t^2 = \boldsymbol{GDP'GDP} - 2\boldsymbol{\beta'X'GDP} + \boldsymbol{X'\beta'X\beta} \qquad (3.37)$$

Taking first order condition of (3.37):

$$\frac{\partial \sum_{t=1}^{n} \widehat{\boldsymbol{u}}_t^2}{\partial \boldsymbol{\beta}} = \begin{bmatrix} \sum_{t=1}^{n} \hat{u}_t^2 \Big/ \partial\beta_0 \\ \sum_{t=1}^{n} \hat{u}_t^2 \Big/ \partial\beta_1 \\ \sum_{t=1}^{n} \hat{u}_t^2 \Big/ \partial\beta_2 \\ \sum_{t=1}^{n} \hat{u}_t^2 \Big/ \partial\beta_3 \\ \sum_{t=1}^{n} \hat{u}_t^2 \Big/ \partial\beta_4 \end{bmatrix} = \frac{\partial(\boldsymbol{GDP'GDP} - 2\boldsymbol{\beta'X'GDP} + \boldsymbol{X'\beta'X\beta})}{\partial \boldsymbol{\beta}}$$

$$= -2\boldsymbol{X'GDP} + \boldsymbol{2X'X\beta} = \boldsymbol{0}$$

The OLS estimator is then:

$$\boldsymbol{\beta} = (\boldsymbol{X}'\boldsymbol{X})^{-\mathbf{1}}\boldsymbol{X}'\boldsymbol{GDP} \tag{3.38}$$

Note that $\boldsymbol{\beta}$ is a vector parameter given by:

$$\boldsymbol{\beta} = \begin{bmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \end{bmatrix}$$

3.5.3 Error Correction Mechanism (ECM)

Given that the data are of higher order integrated, OLS procedures would produce spurious results. But this is not necessarily the case. For instance, assume that all series in the following regression exhibit stochastic trend, that is, $I(1)$.

$$\widehat{GDP}_t = \hat{\beta}_0 + \hat{\beta}_1 GINI_t + \hat{\beta}_2 M2_t + \hat{\beta}_3\, FDI_t + \hat{\beta}_4 NT_t \tag{3.39}$$

If the residual terms generated from the regression, u_t is $I(0)$, then the regression estimated is not spurious, in that the linear combination of GDP_t, $GINI_t$, $M2_t$, FDI_t and NT_t is stationary. Additionally, the variables are said to be cointegrated or exhibit long-run equilibrium and the estimated regression is termed a cointegrating regression.

In the short-run variables may however, diverge from its long-run equilibrium path. There exists a mechanism that is able to correct this short-run disequilibrium. This paper employs a method advanced by Sargan (1964). This is done by including lagged estimated residuals of estimated regression in (3.32) or (3.39) as one of the regressors. Additionally, the first differenced terms of series are obtained in this second regression. Hence ECM regression takes the following form:

$$\Delta\widehat{GDP}_t = \hat{\beta}_0 + \hat{\beta}_1 \Delta GINI_t + \hat{\beta}_2 \Delta M2_t + \hat{\beta}_3 \Delta FDI_t + \hat{\beta}_4 \Delta NT_t + \hat{\alpha} u_{t-1} \quad (3.40)$$

Effectively, the estimated coefficient for estimated residual term, $\hat{\alpha}$ is an indication of the speed of which the system achieves equilibrium again.

3.5.4 Cointegrating Regressions

While OLS may be adequate in estimating relationships among variables of identical integration order, there are other more efficient estimation techniques that may be employed on cointegrating variables. Cointegrating regression procedures reduce any problems that may arise out of the standard OLS method when variables are cointegrated, in that is assures coefficient estimates are asymptotically unbiased. Therefore, three additional cointegrating regressions are performed, as a measure of robustness.

3.5.4.1 Fully Modified Ordinary Least Squares (FMOLS)

The derivation of FMOLS estimator for a multivariate regression is intricate at the very least. This section merely lays out key procedures in the estimation method as presented by Hansen (1992). To simplify discussion, consider a four dimensional vector that summarises variables used in the regression, $X(t) = \big(GINI(t), M2(t), FDI(t), NT(t)\big)$. The cointegrating regression is then:

$$GDP_t = \beta X_t' + \gamma_1 D_{1t} + \mu_{1t} \tag{3.41}$$

Note that D_{1t} is derived from the deterministic trend explanatory variable of $D_t = (D_{1t}', D_{2t}')'$ Moreover, the regressors satisfy the equation:

$$X_t = \Gamma_{21}' D_{1t} + \Gamma_{22}' D_{2t} + \epsilon_{2t} \tag{3.42}$$

where $\Delta\epsilon_{2t} = u_{2t}$.

FMOLS requires an estimation of the long-run covariances of error terms, $cov(u_{1t}, u_{2t})$. u_{1t} is obtained from regression equation (3.41). The term $\Delta\epsilon_{2t} = u_{2t}$ implies that u_{2t} may be generated from a regression of:

$$\Delta X_t' = \hat{\Gamma}_{21}' \Delta D_{1t} + \hat{\Gamma}_{22}' \Delta D_{2t} + \hat{\mu}_{2t} \tag{3.43}$$

Given that $cov(u_{1t}, u_{2t})$ is governed by matrices Ψ and Ξ, the modified data may be expressed as:

$$GDP_t^{+} = GDP_t - \hat{\psi}_{12}\widehat{\Psi}_{22}^{-1}\hat{\mu}_2 \tag{3.44}$$

The bias correction term then may be expressed as:

$$\hat{\lambda}_{12}^{+} = \hat{\lambda}_{12} - \hat{\psi}_{12}\widehat{\Psi}_{22}^{-1}\widehat{\Xi}_{22} \tag{3.45}$$

The FMOLS estimator is therefore:

$$\hat{\theta} = \begin{bmatrix}\hat{\beta} \\ \hat{\gamma}\end{bmatrix} = \left(\sum_{t=1}^{T} Z_t Z_t{}'\right)^{-1}\left(\sum_{t=1}^{T} Z_t GDP_t^{+} - T\begin{bmatrix}\hat{\lambda}_{12}^{+}{}' \\ 0\end{bmatrix}\right) \tag{3.46}$$

Where $Z_t = (X_t', D_t')$.

3.5.4.2 Canonical Cointegrating Regression

CCR is a regression method that generates stationary levels of data to compute least squares estimations of the model, a technique forwarded by Park (1992) .The estimations are then used to remove long-run relationship between the model and stochastic innovations of exogenous variables. Similar to FMOLS, the long-run covariances among residuals are obtained as a first step. The mechanics follow what has been discussed in preceding section. Note that, $cov(u_{1t}, u_{2t})$ is also governed by long-run matrices, Ψ and Ξ as well as a concurrent covariance matrix of $\hat{\Sigma}$.

Since $cov(\hat{u}_t, \hat{u}_{2t})$ is given by:

$$\hat{\Xi}_2 = \begin{bmatrix} \hat{\lambda}_{12} \\ \hat{\Xi}_{22} \end{bmatrix}, \tag{3.47}$$

The cointegrating regression then undergoes the following transformation:

$$X_t^* = X_t - \left(\hat{\Sigma}^{-1}\hat{\Xi}_2\right)' \hat{u}_t \tag{3.48}$$

$$GDP_t^* = GDP_t - \left(\hat{\Sigma}^{-1}\hat{\Xi}_2\bar{\beta} + \begin{bmatrix} 0 \\ \hat{\Psi}_{22}^{-1}\hat{\psi}_{21} \end{bmatrix}\right)' \hat{u}_t \tag{3.49}$$

Where the vector $\bar{\beta}$ is defined as:

$$\bar{\beta} = (\beta_{GINI}, \beta_{M2}, \beta_{FDI}, \beta_{NT})$$

The procedure is then completed by applying OLS estimates on the transformed data:

$$\begin{bmatrix} \hat{\beta} \\ \hat{\gamma} \end{bmatrix} = \left(\sum_{t=1}^{T} Z_t^* Z_t^{*\prime}\right)^{-1} \sum_{t=1}^{T} Z_t^* GDP_t^* \tag{3.50}$$

Where $Z_t^* = (Z_t^{*\prime}, D_{1t}')'$

3.5.4.3 Dynamic Ordinary Least Squares

Another method that can be used to efficiently estimate a cointegrating regression is the dynamic ordinary least squares. DOLS procedure as demonstrated by Stock and Watson (1993), is relatively simple compared to FMOLS and CCR, yet produces adequate regression estimates. Given that the variables are cointegrated, DOLS augments cointegrating regression such that:

$$GDP_t = X_t'\beta + D_{1t}'\gamma_1 + \sum_{j=-q}^{r} \Delta X_{t+j}'\delta + v_{1t} \tag{3.51}$$

Where q is the number of lags and r is the number of leads of differenced series. Leads and lags of the regressors are included to remove cointegration effects in the system. This ensures that error terms generated are orthogonally distributed to with respect to all regressors in the equation, leading to a more efficient estimate.

3.5.5 Causality

To examine causal linkages among the variables used in this study, a reduced form of vector autoregression (VAR) method is used. Generally, the functional form of this approach is given by:

$$x_t = \alpha + \sum_{i=1}^{k} \theta_i x_{t-i} + \sum_{i=1}^{k} \beta_i y_{t-i} + \mu_t \tag{3.52}$$

Statistical significance of the values of β_i would imply that x_t is a function of lagged values of its self and y_{t-i}. Hence, there is unidirectional causality that runs from y to x.

For concreteness, consider the variables *GDP* and *GINI*. In order to ascertain causal linkages between the two, the following equation is estimated.

$$GDP_t = \alpha + \sum_{i=1}^{k} \theta_i GDP_{t-i} + \sum_{i=1}^{k} \beta_i GINI_{t-i} + \mu_t \tag{3.53}$$

Given that β_i is statistically significant, *GINI* is then said to granger cause *GDP*, i.e. unidirectional causality that runs from *GINI* to *GDP*. Notationally, *GINI* ➔ *GDP*. To check for the converse causality relationship, the following equation is specified:

$$GINI_t = \delta + \sum_{i=1}^{k} \phi_i GINI_{t-i} + \sum_{i=1}^{k} \gamma_i GDP_{t-i} + \mu_t \tag{3.54}$$

Similarly, statistical significance of the values of γ_i would imply that $GINI_t$ is a function of lagged values of its self and GDP_{t-i}. Therefore, there is unidirectional causality from GDP to *GINI* (*GDP* ➔ *GINI*). Note that if both causality runs are statistically significant, it is said that there is bidirectional causality between GDP and *GINI* (*GDP* ⇽➔ *GINI*). Similar procedure may be done to examine causality relationships among other variables.

3.6 Diagnostics Tests

Once empirical models have been estimated, the next step would be assessing validity of the models. Diagnostic tests are performed on coefficients and residuals. This section highlights some common diagnostic tests employed in this paper. Note however in the following chapter, additional diagnostic tests are performed for robustness, of which descriptions are provided therein.

3.6.1 Multicollinearity

A problem which will arise from not taking into full consideration of ensuring the classical assumptions are met is multicollinearity. Multicollinearity basically means there is a perfect or linear function among some or all of the explanatory variables in the regression equation. In other words, with existence of multicollinearity, explanatory variables are correlated with each other. This would result in overestimation of fit.

Multicollinearity could be further categorized into perfect and imperfect multicollinearity. A perfect multicollinearity would mean an exact relationship between one explanatory variable with another. An imperfect multicollinearity on the other hand, refers to the state of which there is a strong imperfect linear relationship between a variable with another.

To detect this statistical problem, Variance Inflation Factors (VIF**)** has to be computed. The VIF may be obtained by conducting an auxiliary regression between an explanatory variable with the rest of the explanatory variables, and use R^2 value from the regression equation to conjure up the VIF for that independent variable.

Consider the regressors used in this paper: *GINI*, *M2*, *NT* and *FDI*. A system of auxiliary regression is then:

$$\widehat{GINI}_t = \hat{\gamma}_0 + \hat{\gamma}_1 M2_t + \hat{\gamma}_2 FDI_t + \hat{\gamma}_3 NT_t \tag{3.55}$$

$$\widehat{M2}_t = \hat{\gamma}_0 + \hat{\gamma}_1 GINI_t + \hat{\gamma}_2 FDI_t + \hat{\gamma}_3 NT_t \tag{3.56}$$

$$\widehat{FDI}_t = \hat{\gamma}_0 + \hat{\gamma}_1 GINI_t + \hat{\gamma}_2 M2_t + \hat{\gamma}_3 NT_t \tag{3.57}$$

$$\widehat{NT}_t = \hat{\gamma}_0 + \hat{\gamma}_1 GINI_t + \hat{\gamma}_2 M2_t + \hat{\gamma}_3 NT_t \tag{3.58}$$

Each auxiliary regression will yield given value of R^2. VIF_k may then be computed as:

$$VIF_k = \frac{1}{1-R_k^2} \tag{3.59}$$

Where:

VIF_k = *VIF* value of k^{th} auxiliary regression

R^2_k = R2 value from k^{th} auxiliary regression

where k = *GINI*, *M2*, *NT* and *FDI*.

The rule of thumb used is, if VIF is less than 5, there is no severe multicollinearity. Note that however, a VIF value of less than 5 does not mean there are no correlations what so ever among the explanatory variables. There may be relationships between the variables, but not to the extent that it interferes with model estimation.

3.6.2 Serial Correlation

Another problem which may arise due to violation of the classical assumptions is serial correlation, otherwise known as autocorrelation. This problem refers to the existence of correlation among error terms of regression model. Hence, it violates a classical assumption which states that error terms should not be correlated with each other. Consider two error terms at time t and t-1 is given by, e_t and e_{t-1}. Now suppose that these two error terms are correlated with each other. In other words, the expected value between these two error terms is non-zero, which may be expressed as:

$$E[e_t, e_{t-1}] \neq 0 \quad (3.60)$$

Or

$$e_t = e_{t-1} + \mu_t \quad (3.61)$$

The functions above represent first order autocorrelation. It may be the case that error terms are correlated with several other error terms of different lags, which is known as higher order serial correlation. Autocorrelation may be detected using Durbin-Watson test. Among the items included in the regression output generated by EViews is Durbin-Watson statistic, d. This DW statistic is used to detect autocorrelation problem in the model. Say that value of DW statistic generated is given by d. To assess for existence of serial correlation, the following hypotheses are specified:

Null Hypothesis, H_0: ρ = 0 (No Autocorrelation)

Alternative Hypothesis, H_1: ρ ≠ 0 (Presence of Autocorrelation)

Given a significance level and degrees of freedom, one could obtain the critical values of decision rule given by d_L and d_U. The decision rule is summarised in a diagram as follows:

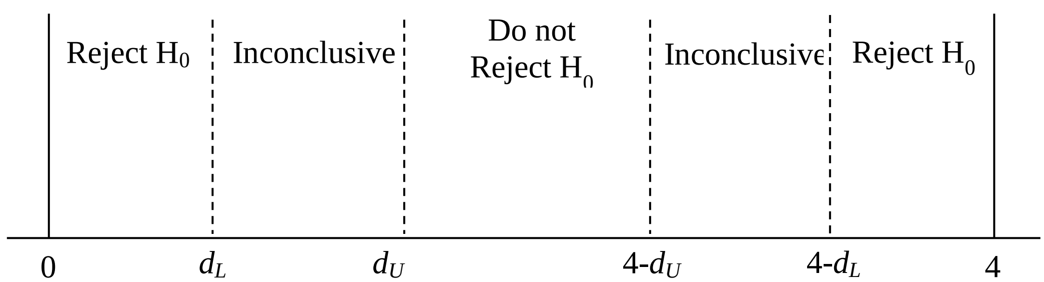

Figure 3.2: Decision rule for Durbin-Watson test

If d falls in rejection region of null hypothesis, then it is concluded that the regression suffers from serial correlation. If null hypothesis is unambiguously not rejected, there is no serial correlation inferred. Notice that this test however, is inconclusive if the statistics fall in the regions $d_L < d < d_U$ and $4 - d_U < d < 4 - d_L$.

An alternative to Durbin-Watson's test is Lagrange Multiplier (LM) test, which is able to detect higher order serial correlation. To illustrate, consider the regression equation specified in (3.32). Obtaining the estimated residuals, $\hat{u}_t$, a secondary regression is run.

$$\hat{u}_t = \gamma_0 + \gamma_1 GINI_t + \gamma_2\, M2_t + \gamma_3\, FDI_t + \gamma_4\, BOP_t + \hat{\alpha}_1\hat{\mu}_{t-1} + \hat{\alpha}_2\hat{\mu}_{t-2} + \hat{\alpha}_3\hat{\mu}_{t-3} + \cdots + \hat{\alpha}_p\hat{\mu}_{t-p} \tag{3.62}$$

Preceding regression equation is specified for an expected serial correlation of p^{th} order. Extracting the value of R^2 generated by the regression, LM test statistic is computed as $(n-p)R^2$, where n is number of observations used. χ^2 distribution is referred to infer on existence of serial correlation. If test statistics is greater than corresponding critical value in χ^2 distribution i.e. $(n-p)R^2 > \chi_p^2$, null hypothesis is rejected, leading to inference of serial correlation. If the reverse or $(n-p)R^2 < \chi_p^2$ is true, then the regression model is free of serial correlation.

3.6.3 Heteroskedasticity

Although more common in cross-sectional studies rather than time series studies, heteroskedasticity is another potential problem that may arise. This problem is said to exist if the variance of each error terms are no longer constant. In other words, error term variances differ across observations. It could be expressed by the following function:

$$Var(\xi_i) = \sigma_i^2 \qquad\qquad i = 1, 2, 3, \dots, n \tag{3.63}$$

White heteroskedasticity test is used to determine the presence of heteroskedasticity problem in the specified model. Firstly, an auxiliary regression of squared error term from the specified model with the explanatory variables, squared terms of the explanatory variables and interaction terms of the explanatory variables is specified. Specifically:

$$\hat{u}_t^2 = \hat{\gamma}_0 + \hat{\gamma}_1 GINI_t + \hat{\gamma}_2 M2_t + \hat{\gamma}_3\, FDI_t + \hat{\gamma}_4 NT_t + \hat{\gamma}_5 GINI_t^2 + \hat{\gamma}_6 M2_t^2 + \hat{\gamma}_7\, FDI_t^2 + \hat{\gamma}_8 NT_t + \hat{\gamma}_9 GINI_t M2_t + \hat{\gamma}_{10} GINI_t FDI_t + \hat{\gamma}_{11} GINI_t NT_t + \hat{\gamma}_{12} M2_t FDI_t + \hat{\beta}_{13} M2_t NT_t + \hat{\gamma}_{14} FDI_t NT_t \tag{3.64}$$

Generated R^2 from the auxiliary regression is used to compute the test statistic:

$$Test\ statistics = nR^2 \tag{3.65}$$

Where n = number of observations included in auxiliary regression. In this case, $n = T$.

Then, the following hypotheses are specified:

Null Hypothesis, H_0 : There is No Heteroskedasticity

Alternative Hypothesis, H_1 : There is Heteroskedasticity

Referring to the above hypotheses, H_0 is rejected if the following condition is met:

$$nR^2 > \chi^2_{df}$$

Where χ^2_{df} is the critical value of distribution χ^2 distribution with given degrees of freedom. For the model specified here, since there are 12 regressors, df = 12. If H_0 is rejected, then the model is void of heteroskedasticity problem.

Alternatives to White's test are Breusch-Pagan, Glesjer and Harvey-Godfrey heteroskedasticity tests. Auxiliary regressions for the tests are given by:

$$\hat{u}_t^2 = \hat{\gamma}_0 + \hat{\gamma}_1 GINI_t + \hat{\gamma}_2 M2_t + \hat{\gamma}_3\, FDI_t + \hat{\gamma}_4 NT_t \tag{3.66}$$

$$|\hat{u}_t| = \hat{\gamma}_0 + \hat{\gamma}_1 GINI_t + \hat{\gamma}_2 M2_t + \hat{\gamma}_3\, FDI_t + \hat{\gamma}_4 NT_t \tag{3.67}$$

$$\ln(\hat{u}_t^2) = \hat{\gamma}_0 + \hat{\gamma}_1 GINI_t + \hat{\gamma}_2 M2_t + \hat{\gamma}_3\, FDI_t + \hat{\gamma}_4 NT_t \tag{3.68}$$

(3.66) is the specification for Breusch-Pagan test, where squared residuals act as the dependent variable. (3.67) is the specification for Glesjer test where absolute values of residuals are endogenous. (3.68) is the specification for Harvey-Godfrey test, where natural logarithm of squared residuals becomes the regressand. Each auxiliary regression gives an R^2 value. The computations of test statistic and decision rules follow that of White's heteroskedasticity test.

4 FINDINGS AND ANALYSIS

This chapter presents results of empirical analysis employed in providing scientific explanations to research questions posed earlier in this paper.

4.1 Stationarity of Series

Prior to proceeding with empirical investigations, it is necessary to determine if the series used are stationary at level, first differences or higher levels of integration. Level of stationarity will dictate empirical tools to be used for investigation. Table 4.1 summarizes stationarities of variables that this paper intends to utilize for analyses.

With the exception of FDI, all variables are non-stationary at the strictest level of significance. Specifically, at 99% confidence level, most series are non-stationary at order zero. This is true for all specification of the ADF test namely with intercept, intercept and trend, and with neither. This eliminates any ambiguity on status of stationarity of the variables. FDI on the other hand, is non-stationary at 99% confidence level with intercept and without intercept and trend specifications, but stationary with intercept and trend specification. At 90% confidence level however, FDI is non-stationarity with all specifications.

Table 4.1: Unit Root Test at Level

Variable	Presence of Unit root	ρ-value	Conclusion
GDP	with intercept	0.9996	series has unit root
	with intercept and trend	0.9910	series has unit root
	without intercept and trend	0.9997	series has unit root
GINI Coefficient	with intercept	0.4922	series has unit root
	with intercept and trend	0.3513	series has unit root
	without intercept and trend	0.2728	series has unit root
Domestic Credit Provided by Banking Sector (% of GDP)	with intercept	0.2876	series has unit root
	with intercept and trend	0.5591	series has unit root
	without intercept and trend	0.7836	series has unit root
Domestic Credit to Private Sector (% of GDP)	with intercept	0.5101	series has unit root
	with intercept and trend	0.9035	series has unit root
	without intercept and trend	0.8609	series has unit root
M2 (% of GDP)	with intercept	0.3156	series has unit root
	with intercept and trend	0.1240	series has unit root
	without intercept and trend	0.8314	series has unit root
FDI	with intercept	0.2310	series has unit root
	with intercept and trend	0.0271	series is stationary**
	without intercept and trend	0.7916	series has unit root

Variable	Presence of Unit root	ρ-value	Conclusion
Net Trade in Goods and Services	with intercept	0.9564	series has unit root
	with intercept and trend	0.8081	series has unit root
	without intercept and trend	0.8854	series has unit root

Note: *, ** and *** denote statistical significance at 90%, 95% and 99% confidence level respectively.

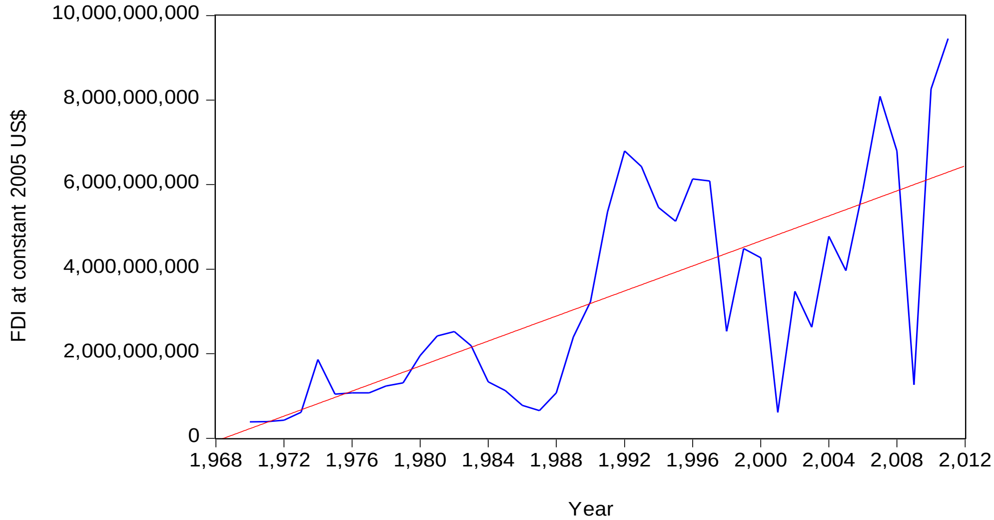

Figure 4.1: FDI's trend line

Figure 4.1 depicts a hypothetical trend line for given observations. Based on the graph, it could be inferred that FDI is a series with trend. Hence, inference on FDI's stationarity on the basis of without trend and intercept specification could be safely ruled out. This however, manages to leave ambiguity with regard to the other two specifications. At a theoretical level, it may be inferred that the series could be tested for stationarity without intercept at which level non-stationarity is accepted at 99% confidence level. For the purpose of determining stationarity with certainty, this paper concludes at 99% confidence level.

Having concluded that all variables are non-stationary at level, the first differences of the series are computed and subjected to similar unit root test procedure. Summary for the procedure is tabled as follows:

Table 4.2: Unit Root Test at First Differences

Variable	Presence of Unit root	ρ-value	Conclusion
GDP	with intercept	0.0000	series is stationary***
	with intercept and trend	0.0000	series is stationary***
	without intercept and trend	0.0000	series is stationary***
GINI Coefficient	with intercept	0.0187	series is stationary**
	with intercept and trend	0.0771	series is stationary*
	without intercept and trend	0.0019	series is stationary***
Domestic Credit Provided by Banking Sector (% of GDP)	with intercept	0.0000	series is stationary***
	with intercept and trend	0.0001	series is stationary***
	without intercept and trend	0.0000	series is stationary***
Domestic Credit to Private Sector (% of GDP)	with intercept	0.0001	series is stationary***
	with intercept and trend	0.0004	series is stationary***
	without intercept and trend	0.0000	series is stationary***

Variable	Presence of Unit root	ρ-value	Conclusion
M2 (% of GDP)	with intercept	0.0000	series is stationary***
	with intercept and trend	0.0000	series is stationary***
	without intercept and trend	0.0000	series is stationary***
FDI	with intercept	0.0000	series is stationary***
	with intercept and trend	0.0000	series is stationary***
	without intercept and trend	0.0000	series is stationary***
Trade in Goods and Services	with intercept	0.0000	series is stationary***
	with intercept and trend	0.0000	series is stationary***
	without intercept and trend	0.0000	series is stationary***

Note: *, ** and *** denote statistical significance at 90%, 95% and 99% confidence level respectively.

As expected with most economic variables, all series are first differenced stationary at 99% confidence level, with the exception of Gini indices. The income inequality measurement is first differenced stationary at 99% confidence level for without intercept and trend specification, at 95% for intercept specification and at 90% for intercept and trend specification. Generally however, Gini indices may be inferred to be first differenced stationary as well. In other words, the series considered in this paper are integrated at order 1, *I*(1).

4.2 Model Estimation

ADF test has concluded that all variables are stationary at first differences. It would therefore be viable to estimate an empirical model using OLS estimation method. Recall that the general model is to be estimated as:

$$GDP = f(GINI, M2, FDI, NT)$$

A specification of the variables is then warranted. *GINI* is the interpolated Gini index, *M2* is M2 measurement of money as a percentage of GDP, *FDI* is foreign direct investment at constant 2005 US$, *NT* is net trade in goods and services at constant 2005 US$ and *GDP* is gross domestic product at constant 2005 US$. Employment of *NT* as a measurement of trade is conventional. There are different proxies however, on measurement of financial development. Commonly used proxies include, total credit (Anwar & Sun, 2011; Zhang, et al., 2012), credit provision to private sector (Jalil & Ma, 2008; Kar, et al., 2011; Kar & Pentecost, 2009) and monetary aggregates (Kar, et al., 2011; Kar & Pentecost, 2009; Wang, 2000). In terms of monetary aggregates as a proxy, Kar and Pentecost (2009) argue that M2 would be more appropriate as opposed to M1. This is due to the fact that M1 is a narrow measurement of money that may not necessarily move in tandem with level of financial intermediation. The latter on the other hand, is a more illiquid measurement of money, which includes items of which operations are facilitated by financial development.

Hence, this paper experiments with three proxies for financial development, *DOMCDT* is domestic credit provided by banking sector as a percentage of GDP, *PVTCDT* is domestic credit provided to private sector as a percentage of GDP and *M2* which has been established earlier to represent M2 as a percentage of GDP. Three models are estimated, each with varying financial development indicator. Model 1 adopts *DOMCDT*, Model 2, *PVTCDT* and Model 3, *M2*. Note that with the exception of *NT*, all variables have undergone logarithmic transformation. *NT* is exempted from the transformation due to existence of negative values. Summary of OLS estimations of the models are tabled in the following:

Table 4.3: Ordinary Least Squares Estimations

Variable	Model 1	Model 2	Model 3
c	16.24060	17.55379	14.93942
	(0.698180)	(0.752941)	(0.683245)
log($GINI_t$)	-0.572319	0.830356	-0.891479
	(0.744023)	(0.874714)	(0.702381)
log($DOMCDT_t$)	0.447377***		
Or	(0.089032)		
log($PVTCDT_t$)		0.556771***	
Or		(0.099462)	
log($M2_t$)			0.603172***
			(0.119853)
log(FDI_t)	0.281904***	0.251841***	0.298601***
	(0.038934)	(0.038606)	(0.038250)
NT_t	1.87×10^{-11}***	1.92×10^{-11}***	1.57×10^{-11}***
	(2.19×10^{-12})	(2.10×10^{-12})	(2.22×10^{-12})
$\bar{R}^2$	0.934509	0.940342	0.934591
F-statistic	147.2607***	162.5628***	147.4559***
Durbin-Watson Statistics	1.368780	1.241455	1.505645
Sum Error of Regression	0.172956	0.165075	0.172849
Akaike Information Criterion	-0.560211	-0.653492	-0.561457

Note: Values in parentheses are standard errors. *, ** and *** denote statistical significance at 90%, 95% and 99% confidence level respectively.

Interpretation of the coefficients is in order. For Model 1, a percentage increase in $GINI_t$ will result in decline in GDP_t by 0.57%, holding other variables constant. Percentage increase in $DOMCDT_t$ and FDI_t exerts upward push on GDP_t by 0.45% and 0.28% respectively, ceteris paribus. A unit increase in NT_t results in increase in GDP_t by $1.87x10^{-9}$%. Taking exponential transformation of this value in order to get a better perspective, yields a unit of 1. Hence, an increase in NT_t by US$ 1 leads to increment in GDP_t by US$ 1, holding constant other variables. Value of $\bar{R}^2$ is 0.9345 which indicates that 93.45% of variations in GDP_t are explained by variables included in the model. This implies that the model generally is of a good fit, i.e. estimated values generated by the model do not diverge significantly from observed values. This is reinforced by a probability value of F-statistic of nil, indicating statistical significance at 99% confidence level. Additionally, three out of four variables included namely, $DOMCDT_t$, FDI_t and NT_t are statistically significant at 1% significance level.

Meanwhile for Model 2, a percentage increase in $GINI_t$, $PVTCDT_t$ and FDI_t is associated with 0.83%, 0.56% and 0.25% increment in GDP_t respectively, ceteris paribus. Increase in NT_t by US$ 1 induces GDP_t to increase by $1.92x10^{-9}$%, or US$ 1. Similarly, statistical significance of variables is achieved at 99% confidence level for $PVTCDT_t$, FDI_t and NT_t. Overall fit is substantiated by $\bar{R}^2$ value of 0.9403, indicating the model explains 94.03% *GDP* variations and statistical significance of F-statistic at 1% significance level.

Finally in Model 3, increase in $GINI_t$ by 1% results in fall in GDP_t by 0.89%. GDP_t increment by 0.6%, 0.3% and $1.57x10^{-9}$% or 1 US$ is associated with 1% increase in $M2_t$ and FDI_t as well as unit increase in NT_t respectively. 99% confidence level statistical significance is observed for $M2_t$, FDI_t, NT_t and F-statistic. 93.6% of variations in GDP_t are explained by the model, indicating a good overall fit.

Generally all models are considered satisfactory, in that it produces results that are close to expectations. With respect to financial development, all proxies indicate positive association with GDP_t, with $M2_t$ is the most prominent in terms of magnitude. It is necessary however, to select a model to be committed to further analytical procedures. A possible selection procedure constitutes examining AIC values. Model 1, 2 and 3 yield AIC values of -0.5602, -0.6535 and -0.5615 respectively. On the basis of lowest AIC scores, Model 2 and 3 are selected. Note that parameter for *GINI* variable for model 2 is positive. This is in contradiction to hypothesis projected in this paper. Moreover, Durbin-Watson statistics, *d* for model 2 is further than the threshold value of non-serially correlated series. *d* value for Model 2 is 1.24 while for Model 3 is 1.51. Model 3 is hence a safer path, to avoid with dealing with serially correlated series. Thus, on the basis of theoretical congruency and statistical delicateness, Model 3 is to be subjected to further scrutiny. Specifically, this paper proceeds with the following estimated model:

$$\log(\widehat{GDP_t}) = 14.9394 - 0.8915\log(GINI_t) + 0.6032\log(M2_t) + 0.2986\log(FDI_t) + 1.57\text{x}10^{-11}BOP_t$$

4.3 Cointegration

Recall that the endogenous as well as exogenous variables are non-stationary at level, but stationary at first differences. Additionally, the model chosen for further analysis includes GDP_t, $GINI_t$, $M2_t$, FDI_t and NT_t. Given the stationarity conditions of the said variables, there is a possibility of cointegration i.e. log-run relationship. Several methods are at disposal in statistics to validate existence of such relationship. This paper examines residuals of the chosen model and applies Johansen cointegration test for robustness.

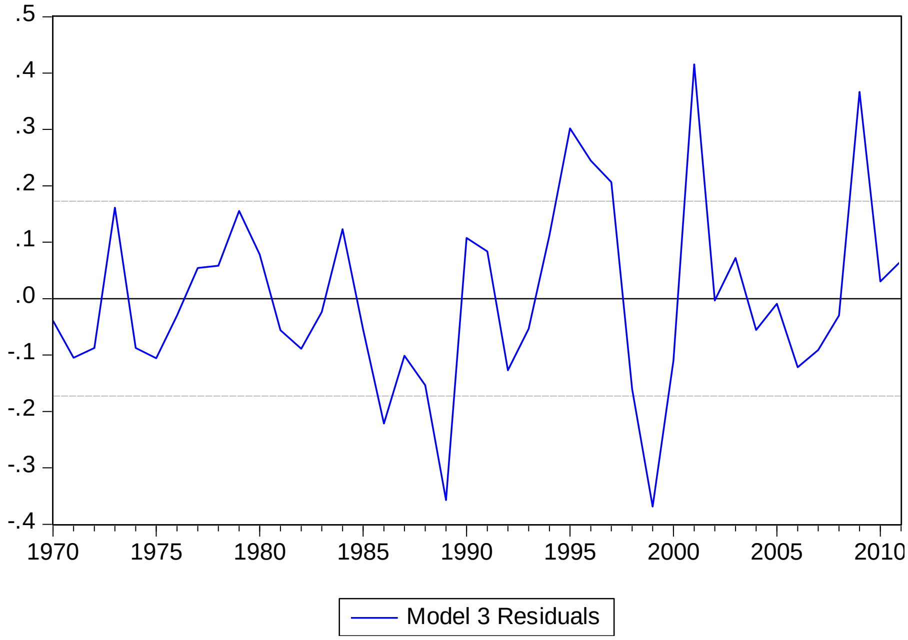

Figure 4.2: Estimated Residuals of Model 3

Figure 4.2 displays the plotted residuals generated by Model 3. The series exhibit fluctuation around a constant mean of zero. This behaviour indicates stationarity. For more concrete evidence however, ADF test is performed on the residuals.

Table 4.4: Unit Root Test of Residuals at Level

Variable	**Presence of Unit root**	**p-value**	**Conclusion**
$\hat{u}_t$	with intercept	0.0003	series is stationary***
	with intercept and trend	0.0016	series is stationary***
	without intercept and trend	0.0000	series is stationary***

Note: *, ** and *** denote statistical significance at 90%, 95% and 99% confidence level respectively.

The preceding table displays summary of unit root test for estimated residuals generated by Model 3. It is unambiguously inferred that the residuals are stationary at level at 99% confidence level, with all ADF test specifications. Since GDP_t, $GINI_t$, $M2_t$, FDI_t and NT_t are integrated at the same level, $I(1)$ and concurrently, u_t associated with the model containing the given explanatories is governed by an integration order, $I(0)$, it is viable to state that a cointegrating relationship exists among the variables. In other words, the variables exhibit similar stochastic drift such that it cancels out non-stationarity, as is projected in the residuals.

In lending rigour to this paper's discussion, Johansen cointegration test is performed on GDP_t, $GINI_t$, $M2_t$, FDI_t and NT_t. Summary of the results is tabled as follows:

Table 4.5: Johansen Cointegration Test

Hypothesised Cointegrating Relation	Trace Statistic	Probability
None	73.05544	0.0269
At most 1	44.37300	0.1024
At most 2	24.69148	0.1728
At most 3	12.21039	0.1471
At most 4	3.44472	0.0634

The first column in Table 4.5 lays out null hypotheses of the test. The second column is trace statistic, followed by its associated probability value in the last column. At 95% confidence level, null hypothesis of no cointegrating relationship is rejected. Meanwhile, null hypotheses of at most 1, 2, 3 and 4 cointegrating relationship fail to be rejected. Hence, there is at least one cointegrating vector among the variables.

The two tests performed in this section ascertain the existence of long-run relationship among GDP_t, $GINI_t$, $M2_t$, FDI_t and NT_t. Consequentially, it is beneficial to note at this stage that since the variables are cointegrated, the parameters computed in the OLS estimation earlier represent long-run coefficients, which the variables follow.

Table 4.6: Pairwise Engle-Granger Cointegration Test

	Dependent Variable				
	log(GDP_t)	**log($GINI_t$)**	**log($M2_t$)**	**log(FDI_t)**	**NT_t**
log(GDP_t)	-	-12.5307	-13.76006	-25.86227***	-5.396463
		(0.1846)	(0.1403)	(0.0046)	(0.6824)
log($GINI_t$)	-11.0871	-	-13.35003	-19.97464**	-1.200148
	(0.2525)		(0.1543)	(0.0280)	(0.9626)
log($M2_t$)	-9.529951	-8.608679	-	-19.74550**	-3.000559
	(0.3469)	(0.4119)		(0.0299)	(0.8758)
log(FDI_t)	-15.81246*	-8.827421	-13.31668	-	-3.477780
	(0.0853)	(0.3958)	(0.1555)		(0.8425)
NT_t	-6.365429	-2.107906	-8.517560	-15.03068	-
	(0.5963)	(0.9269)	(0.4187)	(0.1035)	

Note: In parentheses are probabilities of statistics. *, ** and *** denote statistical significance at 90%, 95% and 99% confidence level respectively.

Long-run equilibrium in the model has been established. There is however, possibility of pairwise cointegration among the variables. Table 4.6 summarises pairwise Engle-Granger cointegration test among variables included in the model. Presented are the z-statistics, with probabilities in parentheses. Engle-Granger is a residual based test, which detects cointegrating variables in a single cointegration equation. The first equation where log(GDP_t) is endogenous, coefficient for log(FDI_t) statistically significant at 90% confidence level. Meanwhile in the equation where log(FDI_t) is endogenous, coefficient for

$\log(GDP_{t})$ is statistically significant at 99% confidence level, $\log(GINI_t)$ and $\log(M2_t)$ at 95% confidence levels. No cointegrating relationship is detected in $\log(GINI_t)$, $\log(M2_t)$ and NT_t cointegrating equations. There is hence, cointegrating relationship between GDP_{t} and FDI_t, $GINI_t$ and FDI_t as well as $M2_t$ and FDI_t.

4.4 Error Correction Model

It has been established in previous section that there is a long-run relationship or equilibrium in the empirical model specified. In the short-run however, there may be disequilibrium, of which is corrected across time dimension. ECM model is presented in this section, to obtain insight into short-run dynamics. Additionally a point to note that, ECM is not a different estimation technique, but rather a different model specification on the same estimation method.

Table 4.7 lays out the corresponding ECM for Model 3. Note that in ECM specification, the first differences of the variables have been generated prior to estimation, a procedure of which has been described in section 3.5.3. Coefficients for differenced explanatories are the short-run parameters. For instance, while the long-run relationship between GDP_t and $GINI_t$ is negative, with a coefficient value of 0.89, the short-run relationship on the other hand, is positive, with a coefficient value of 0.81. Hence, a percentage change in $GINI_t$ induces a short-run response in GDP_t, that is governed by the same direction of change, by 0.89%. Similarly, percentage change in $M2_t$ and FDI_t induce the same direction of change in GDP_t, by 0.04% and 0.11% respectively. Finally, a unit change in NT_t induces an opposing change of magnitude $6.44\text{x}10^{-13}$% or US$ 1.

Table 4.7: Ordinary Least Squares Estimation and Corresponding Error Correction Model

OLS		ECM	
Variable	**Statistics**	**Variable**	**Statistics**
c	14.93942	**c**	0.056686
	(0.683245)		(0.017137)
log($GINI_t$)	-0.891479	**Δlog($GINI_t$)**	0.805128
	(0.702381)		(1.088793)
log($M2_t$)	0.603172***	**Δlog($M2_t$)**	0.041177
	(0.119853)		(0.117386)
log(FDI_t)	0.298601***	**Δlog(FDI_t)**	0.111418***
	(0.038250)		(0.026287)
NT_t	$1.57\text{x}10^{-11}$***	ΔNT_t	$-6.44\text{x}10^{-15}$
	($2.22\text{x}10^{-12}$)		($3.67\text{x}10^{-12}$)
		$\hat{u}_{t-1}$	-0.267644**
			(0.113209)
$\bar{R}^2$	0.934591	$\bar{R}^2$	0.286709
F-statistic	147.4559***	**F-statistic**	4.215621***
Durbin-Watson Statistics	1.505645	**Durbin-Watson Statistics**	1.515547
Sum Error of Regression	0.172849	**Sum Error of Regression**	0.098933
Akaike Information Criterion	-0.561457	**Akaike Information Criterion**	-1.654288

Note: Values in parentheses are standard errors. *, ** and *** denote statistical significance at 90%, 95% and 99% confidence level respectively.

Several saliences in the estimated ECM are worth to be highlighted. While statistical significance of the collective explanatory power of explanatories is still within rejection interval of null hypothesis, statistical significance of the variables individually has swayed. Specifically, $M2_t$ and NT_t have lost statistical significance even at 90% confidence level in the ECM model. FDI_t retained significance at 99% confidence level and $GINI_t$ remains statistically insignificant. Secondly, the direction of relationship between some of the exogenous variables with GDP_t has also changed. While increase in Gini index is associated with decline in GDP in the long-run, GDP increases with Gini index increment in the short-run. On the other hand, while the relationship between NT_t and GDP_t is positive in the long-run, a negative relationship is exhibited by the two in the short-run.

A final and perhaps the most important interpretation is in order. The coefficient for $\hat{u}_{t-1}$, the error correction term (ECT) is -0.2676. As expected, the term carries a negative sign (Antzoulatos, 1996). This means that any disequilibrium in the short-run is corrected, within a year, by as much as 26.76%. Recall that short-run parameters are starkly different than the long-run equilibrium counterparts, on the basis of sign and magnitude. This will inevitably lead to a divergence in GDP_t, from its equilibrium. This is corrected within a year by 26.76%, achieving a steady state in the long-run.

4.5 Diagnostics

This section presents diagnostic examinations on OLS and ECM models specified earlier. Diagnostic examinations are done on residuals, parameters and models' stability.

4.5.1 Coefficient Diagnostics

A common problem associated with coefficient diagnostics is multicollinearity. For both models, VIFs have been computed, in order to assess the existence of such violation of Gaussian assumption.

Table 4.8: Variance Inflation Factors

Variable	Model	
	OLS	ECM
$GINI_t$	3.223903	1.032242
$M2_t$	2.928463	1.271718
FDI_t	1.724421	1.309432
NT_t	1.469353	1.08226
u_t		1.44153

Table 4.8 displays VIF values for each variable in both OLS estimation and its ECM counterpart. Applying rule of thumb that is, since VIF values for all variables are less than 5, there is no severe multicollinearity problem in both models. Hence, parameters are stable with respect to changes in data or model specification. Also note that the degree of multicollinearity exhibited by variables in OLS estimation has been reduced in ECM model.

Another issue associated with coefficient estimates are the extent of force exerted by independent variables on growth in comparison to each other. Hence, standardized coefficients which are presented in Table 4.9 will certainly put on a better perspective, for analysis.

For the conventional OLS estimation, increase in $GINI_t$ by one standard deviation reduces GDP_t by 0.09 standard deviation. Meanwhile increase in FDI_t, $M2_t$ and NT_t by one standard deviation increases GDP_t by 0.343, 0.41 and 0.341 standard deviation respectively. Based on the standardized coefficients, it may be inferred that FDI_t exerts the most influence on GDP_t in the long-run. The force declines with $M2_t$, NT_t and $GINI_t$ in that order.

Table 4.9: Scaled Coefficients

	Model	
Variable	**OLS**	**ECM**
$GINI_t$	-0.0910240	0.1003260
	(0.0266610)	(-0.0462630)
$M2_t$	0.3439850	0.0528250
	(0.1105230)	(0.0994620)
FDI_t	0.4094550	0.6476870
	(0.2577100)	(0.1353470)
NT_t	0.3410490	-0.0002440
	(0.0066450)	(-0.0000969)
u_t		-0.3790440
		(0.0067770)

Note: Values in parentheses are elasticity at means.

With respect to ECM model, one standard deviation increment in $GINI_t$, $M2_t$ and FDI_t increases GDP_t by 0.1, 0.053 and 0.65 respectively. While a standard deviation increase in NT_t is predicted to reduce GDP_t by 0.00024 standard deviation. Hence short-run variations emanating from FDI_t is again, the most forceful. The effects of short-run variations decline with $M2_t$, $GINI_t$ and NT_t in that respect.

A notable feature from these inferences is that $GINI_t$ and FDI_t seem to exert more influence in the short-run as opposed in the long-run. The reverse is true for $M2_t$ and NT_t, thus changes stemming from these two variables are not likely to affect short term economic prospects significantly. Secondly, the effects of variations in FDI on GDP seem to be prevalent on both accounts of long- and short-run, an element worth to be highlighted for the attention of interested parties.

4.5.2 Stability Diagnostics

Another form of important diagnostics that need to be performed on empirical models are stability tests. This section presents some measures to ascertain whether the estimated models are stable.

A source of instability in empirical models is misspecification, which in turn may result from omission of important variables or an underlying non-linear relationship. To assess this, RESET test is performed on the models specified earlier.

Table 4.10: Ramsey RESET Test

Exponential power	Model	
	OLS	ECM
2	0.1791	0.0715*
2 and 3	0.4076	0.1845

Note: *, ** and *** denote statistical significance at 90%, 95% and 99% confidence level respectively.

Preceding table summarises RESET test results. The first column specifies number of exponential power for the test specification. Exponential power of 2 indicates that squared residuals from original equation are included as a regressors. Exponential power of 2 and 3 simply means that squared residuals and cube residuals are included as regressors in the test equation. Significance of test statistics which is achieved if probabilities are less than significance levels implies that the model suffers from misspecification. For congruency, a benchmark of 95% confidence level i.e. 5% significance level is set. At 5% significance level, both test specifications indicate no model misspecification for OLS model. Though ECM's performance is not equivalent to that of OLS's, it could still be concluded that the model does not suffer from any misspecification at 95% confidence level.

Another method commonly used to assess model stability is recursive least squares, a technique that estimates the model repeatedly, using more observations at successive estimation. This paper presents recursive residuals, cumulative sum of recursive residuals (CUSUM) and recursive coefficient estimates as additional measures of stability diagnostics.

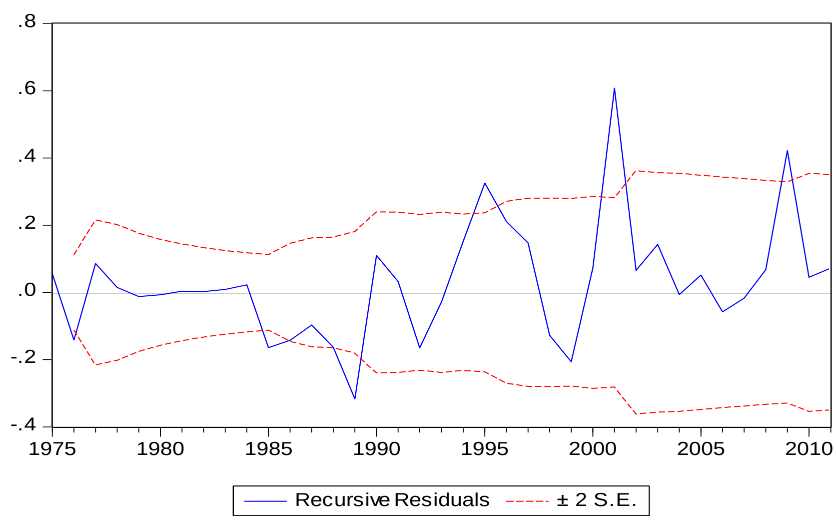

Figure 4.3: Recursive Residuals for OLS estimation

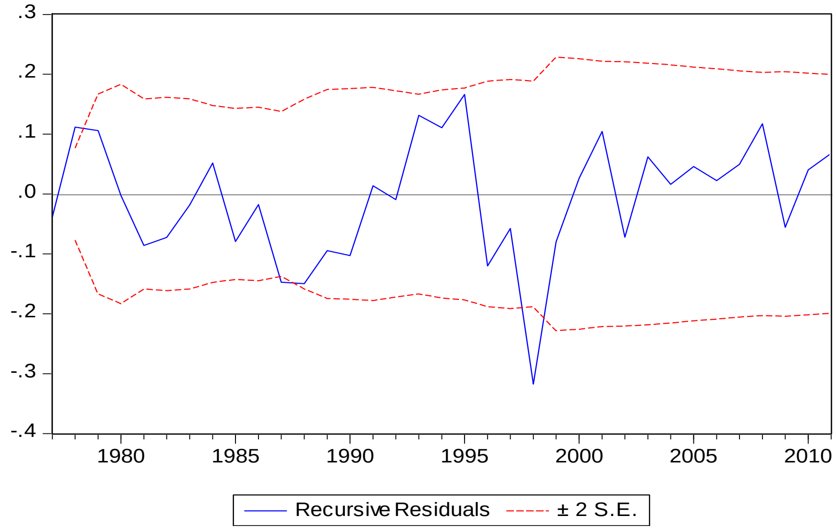

Figure 4.4: Recursive Residuals for ECM model

Figure 4.3 shows recursive residuals for OLS and Figure 4.4 for ECM. Residuals that persistently lie outside the standard error margin indicate model instability. OLS residuals generally lie within the two standard error margin, with the exception in 1985, 1989, 1995, 2001 and 2009. Indication of instability in the corresponding years may be due to exogenous shocks that destabilises the model. The year 1987 for instance, witnessed a stock market crash in the U.S. which may have affected global trade and hence Malaysia's economy. The economic downturn persisted to early 1990s. In 2000, another recession took place mostly in developed countries, which was due to a boom in 1990s. 2007 was the beginning of Global Financial Crisis in U.S., which echoed throughout the world. Of the five years that residuals are beyond the standard error band, only in 2001 is the extent of divergence is severe. In other years, the residuals merely lie near the peripherals. ECM's recursive residuals perform better. Only in 1998 that residuals unambiguously lie beyond 2 standard error margin. This may be due to the fact that ECM better predicts short-run variations in the variables. The outlier in 1998 however, is most probably due to magnitude of shock generated, in the 1997 Asian Financial Crisis.

This paper now turns to recursive coefficients. This form of recursive tool shows evolution of coefficients as more data are used for estimation. Violent fluctuation of recursive coefficient is an indication of model instability and implies a structural break with regard to the variable associated with the parameter.

Figure 4.5 shows recursive coefficients for OLS estimation. Note that C(1) is a constant while C(2), C(3), C(4) and C(5) are coefficients for $GINI_t$, $M2_t$, FDI_t and NT_t respectively. As more observations are used for estimation, parameter for $GINI_t$ declines and stabilises by the first five observations. Coefficient for $M2_t$ also stabilises by the first five data, but exhibits slight variation between 1983 and 1990. Recursive estimates for FDI_t and NT_t however, indicate instability. After stabilising within the first five observations, the parameter fluctuates considerably between data points 1983 and 2001. Parameter for NT_t also experiences violent fluctuations between 1985 and 2001, before stabilising to final coefficient value.

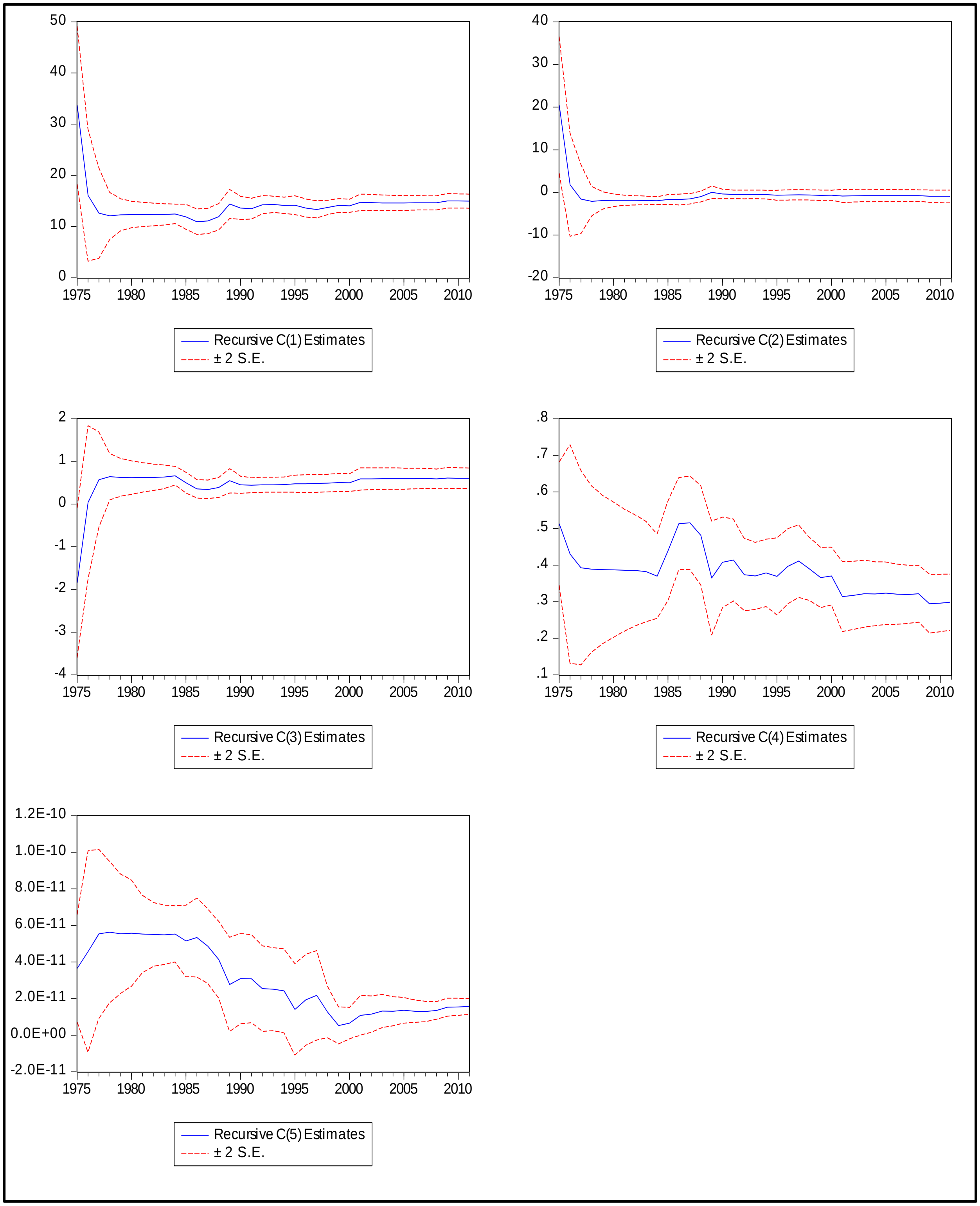

Figure 4.5: Recursive Coefficients for OLS

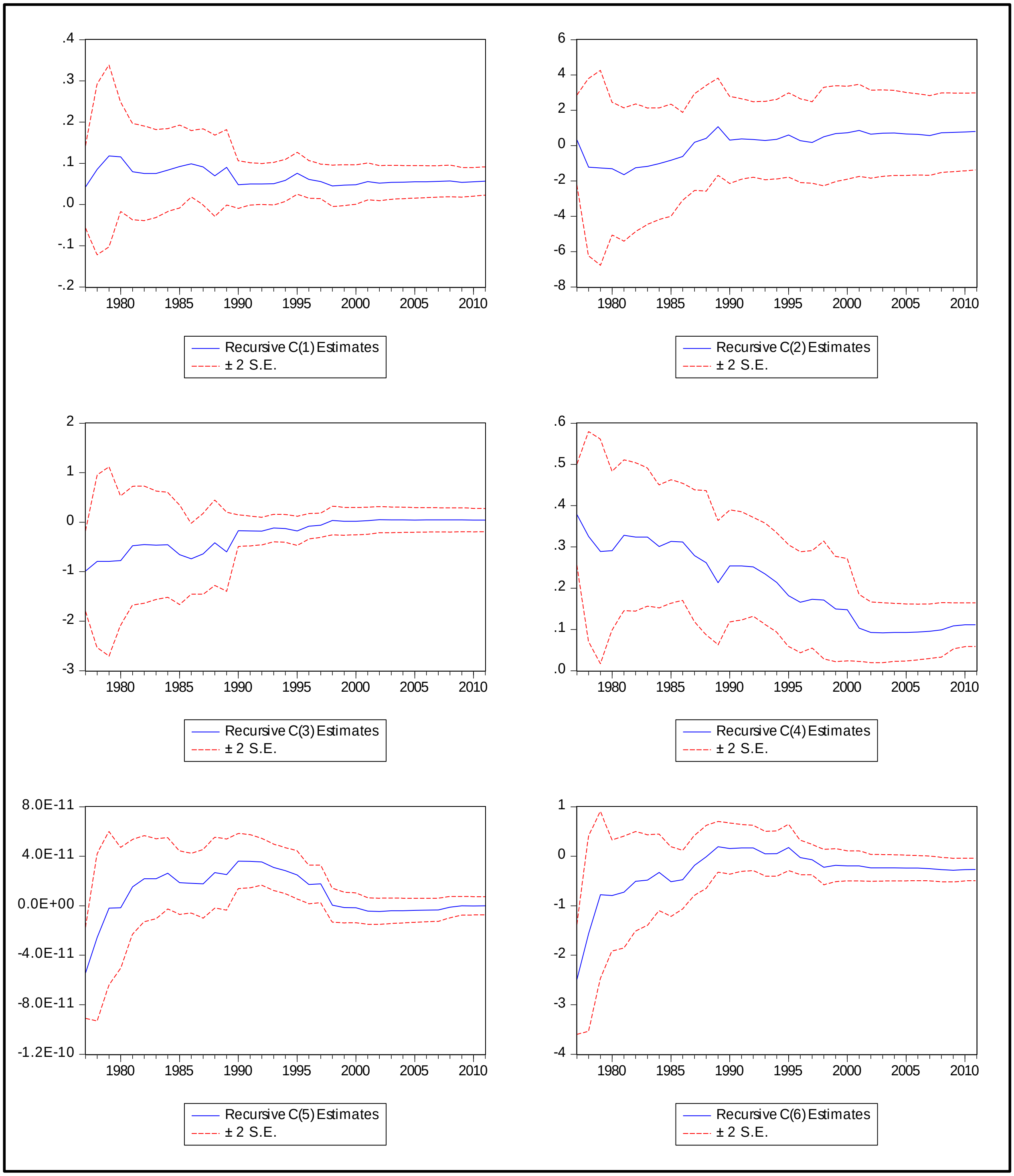

Figure 4.6: Recursive Coefficients for ECM

Figure 4.6 depicts recursive coefficients for ECM model. Note that C(1) is a constant while C(2), C(3), C(4), C(5) and C(6) are coefficients for $GINI_t$, $M2_t$, FDI_t, NT_t and ECT respectively. Parameters for $GINI_t$ and $M2_t$ behaved similarly, exhibiting fluctuations from the first data point to 1990. After that period, the coefficients stabilise and converge to its respective final values. Coefficient for FDI_t and NT_t shows similar erratic behaviour as seen in the original OLS estimation model. Parameters for both variables stabilise after the data point 2000. Meanwhile, recursive coefficients for ECT show slight fluctuations in the first half of the data set. The parameter however, achieves stability and converges after data point 1995.

At this juncture, on the basis of recursive coefficients, some readers may infer that instability is a problem in this paper's empirical model especially with respect to FDI_t and NT_t. In spite of this limitation that is inherently unavoidable, this author highlights that even for FDI_t and NT_t, recursive estimates show that the parameters manage to stabilise before converging to the final value obtained in the output.

For conclusiveness, this paper presents another measure to assess coefficient instability. CUSUM test plots the cumulative sum of residuals generated by the model, coupled by a 5% significance level band. Coefficient instability may be inferred if the statistics sway beyond the interval.

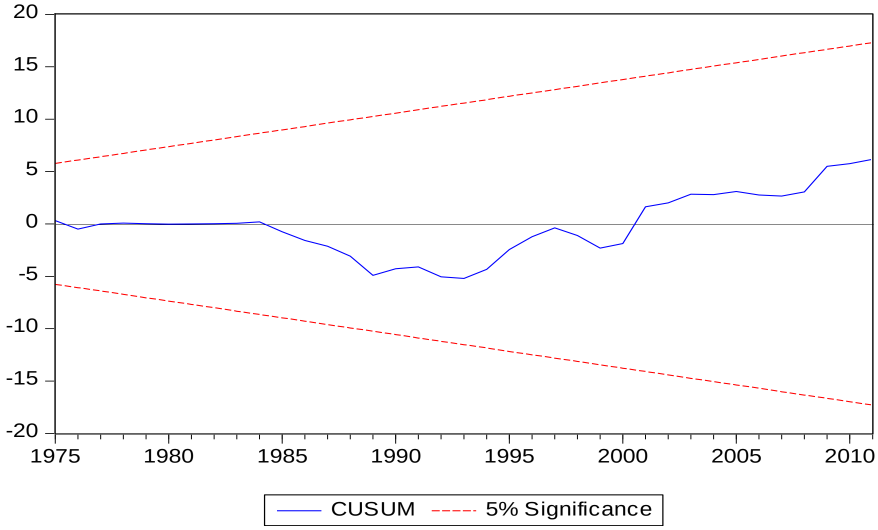

Figure 4.7: CUSUM Statistics for OLS

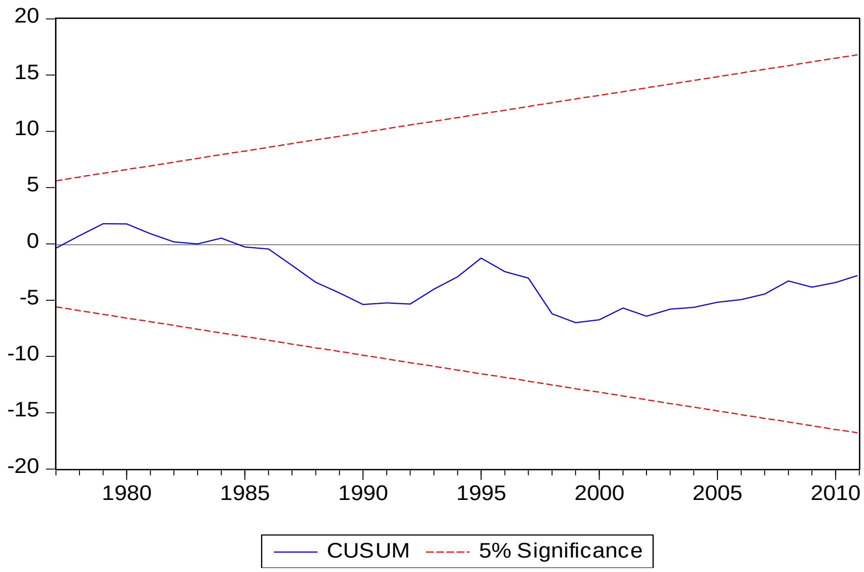

Figure 4.8: CUSUM Statistics for ECM

CUSUM plot for OLS and ECM models as depicted in Figure 4.7 and 4.8 respectively clearly indicates model stability since the statistics lie within 5% significance level interval.

On the account of stability, tests presented in this section imply that the empirical model specified is appropriate and thus, fit for further analysis.

4.5.3 Residual Diagnostics

Another aspect of empirical models that needs to be examined is the residuals. The residuals ought to be free of serial correlation, where the residuals are correlated with each other across time and Heteroskedasticity where the variances of residuals are not constant.

Table 4.11: Summary of Residual Diagnostics

Diagnostics	**Test**	**Null Hypothesis**	**OLS**	**ECM**
Serial Correlation	Serial Correlation LM	No Serial Correlation	0.0639	0.0161
Heteroskedasticity	Breusch-Pagan-Godfrey	Homoskedastic Residuals	0.0137	0.2631
Heteroskedasticity	Harvey	Homoskedastic Residuals	0.0802	0.7424
Heteroskedasticity	White	Homoskedastic Residuals	0.0194	0.4043
Heteroskedasticity	ARCH	Homoskedastic Residuals	0.6529	0.2012
ARMA	Squared Residuals Correlogram	-	No ARMA structure	No ARMA structure

A summary of residuals diagnostics performed in this section is presented in Table 4.11. Probability value of test statistics for the original OLS model under LM Test is

0.0639, thereby failing to reject null hypothesis. Thus, serial correlation may be ruled out as a problem for this model. Breusch-Pagan-Godfrey ρ-value is 0.0137, which is less than 5% significance level. This indicates heteroskedasticity problem in the model. Harvey test however, rules out heteroskedasticity at 95% confidence level. As a measure of certainty, White's test and ARCH test are also carried out. With a probability value of 0.0194 White's test indicate presence of heteroskedasticity while ARCH rules out heteroskedasticity with a ρ-value of 0.6529. There is hence, a certain degree of uncertainty with regards to variances of residuals in the model.

Probability value of test statistics for ECM under LM test is 0.0161, implying that the model faces serial correlation problem. This however, requires some interpretation. Serial correlation is innate in any ECM specification. To illustrate, consider a simple two variable model:

$$y_t = \beta_0 + \beta_1 x_t + \mu_t \tag{4.1}$$

The error correction model would then be:

$$y_t - y_{t-1} = \alpha_0 + \alpha_1(x_t - x_{t-1}) + \mu_{t-1} + v_t \tag{4.2}$$

Hence, yielding an innovation of:

$$v_t = y_t - y_{t-1} - \alpha_0 - \alpha_1(x_t - x_{t-1}) - \mu_{t-1} \tag{4.3}$$

At $t + 1$:

$$v_{t+1} = y_{t+1} - y_t - \alpha_0 - \alpha_1(x_{t+1} - x_t) - \mu_t \tag{4.4}$$

Where:

$$\mu_t = y_t - \beta_0 - \beta_1 x_t, \tag{4.5}$$

$$v_{t+1} = -\alpha_0 + \beta_0 + y_{t+1} - 2y_t - \alpha_1 x_{t+1} + (\alpha_1 + \beta_1)x_t \tag{4.6}$$

Therefore:

$$E[v_{t+1}, v_t] = f(x_t, y_t) \tag{4.7}$$

$$E[v_{t+1}, v_t] \neq 0 \tag{4.8}$$

It has been shown that the expectation between innovations in an ECM specification is non-zero. Therefore, serial correlation in ECM is systemic. This however is remitted, as the implication of the model is needed as part of analysis.

Breusch-Pagan-Godfrey, Harvey, White and ARCH test indicate that the model does not suffer from heteroskedasticity, as all probability values are greater than 0.05. Additionally, an examination on correlogram of residuals of both original OLS and ECM specifications does not indicate that any ARMA structure needs to be included.

4.5.3.1 Feasible Generalised Least Squares and Autoregressive Conditional Heteroskedasticity Estimations

Given the ambiguity with regards to presence of heteroskedasticity in OLS estimation, there are now two alternatives. First is to accept Harvey and ARCH test conclusions that variances of residuals are constant and proceed with the OLS estimation. Second is to apply estimation methods that can remove heteroskedasticity and derive inferences from the new models. This section proposes an application of Feasible Generalised Least Squares (FGLS) and Autoregressive Conditional Heteroskedasticity (ARCH) estimation techniques for this paper's framework.

Table 4.12: Feasible Generalised Least Squares and Autoregressive Conditional Heteroskedasticity Estimations

	Estimation Method	
Variable	**FGLS**	**ARCH**
c	15.42899	14.93942
	(0.58175)	(1.361426)
log($GINI_t$)	-1.278305***	-0.891479
	(0.330172)	(2.085266)
log($M2_t$)	0.677685***	0.603172*
	(0.08006)	(0.322232)
log(FDI_t)	0.24749***	0.298601***
	(0.035288)	(0.067822)
NT_t	1.49×10^{-11}***	1.57×10^{-11}
	(1.82×10^{-12})	(1.56×10^{-11})
$\bar{R}^2$	0.930219	0.934591
Durbin-Watson Statistics	1.221371	1.505645
Sum Error of Regression	0.178531	0.172849

Note: Values in parentheses are standard errors. *, ** and *** denote statistical significance at 90%, 95% and 99% confidence level respectively.

Table 4.11 presents the statistics for FGLS and ARCH estimations. FGLS estimation predicts that an increase in $GINI_t$ by 1% induces a decline in GDP_t by 1.28%. While increase in $M2_t$, FDI_t and NT_t is associated with 0.68%, 0.25% and 1.49×10^{-9}% (US$ 1) increase in GDP_t respectively. Several interesting features that arise in this estimation are worth mentioning. $GINI_t$ and $M2_t$ are projected in this estimation, to exert a greater effect on GDP_t compared to that of OLS. Influence of FDI_t and NT_t on the other hand, are of less magnitude. Additionally, all variables are statistically significant at 99% confidence level. This however, needs to be treated with caution. Notice that Durbin-Watson statistics are considerably low, indicating serial correlation. Although this does not lead to biased estimation, conclusions on statistical significances are not reliable.

Notice that ARCH estimation does not alter coefficients generated by OLS. Hence interpretations made in section 4.2 still hold. Improvements in this estimation are made upon standard errors of variables, which leads to more reliable conclusions on statistical significance. Indeed, $M2_t$ that is significant at 99% confidence level in OLS, only manages to achieve statistical significance at 90% confidence level in ARCH. NT_t in ARCH is not significant at all confidence levels, while being significant at 99% confidence level in OLS. Only FDI_t retains statistical significance in ARCH estimation. The model as a whole however, is still a good fit, with $\bar{R}^2$ value of 0.9350. A Durbin-Watson value of 1.51 also indicates that extent of interference stemming from serial correlation is also less in ARCH as opposed to FGLS.

This author hence guides readers who wish to obtain strictly unbiased estimated coefficients to refer to FGLS estimation. However, good faith should not be placed on statistical significance of the model. ARCH estimation improves upon that of made using OLS, by offering more reliable statistical significance test conclusions.

Table 4.13: Heteroskedasticity Tests on FGLS and ARCH

Test	Null Hypothesis	FGLS	ARCH
Breusch-Pagan-Godfrey	Homoskedastic Residuals	0.6038	-
Harvey	Homoskedastic Residuals	0.0926	-
White	Homoskedastic Residuals	0.0657	-
ARCH	Homoskedastic Residuals	0.6640	-
ARCH LM Test	Homoskedastic Residuals	-	0.4530

Table 4.13 summarises heteroskedasticity tests on the two new estimations. Breusch-Pagan-Godfrey, Harvey, White and ARCH tests rule out heteroskedasticity in FGLS at 95% confidence level. A special heteroskedasticity test is applied on ARCH estimation, and it is concluded that model estimated with this technique is also void of heteroskedasticity. That is, probability if ARCH LM test is 0.453, which is greater than 5% significance level. This section therefore has offered reliable model estimations, on the basis of rejection of Harvey and ARCH test conclusions conducted earlier.

4.6 System Equations

Having established the general empirical model, this paper now turns to system equations. VECM is employed to analyse lagged interactions among the variables.

Table 4.14: Vector Error Correction Model

Exogenous Variables	Endogenous Variables				
	Δlog(GDP_t)	**Δlog($GINI_t$)**	**Δlog($M2_t$)**	**Δlog(FDI_t)**	**Δ(NT_t)**
log(GDP_{t-1}) - (2.0×10^{-11}) NT_{t-1} - 24.79551	-0.214034	0.000675	0.279604	2.304108**	1.50×10^{10}*
	(0.2910)	(0.9755)	(0.3137)	(0.0365)	(0.0852)
log($GINI_{t-1}$) - (5.61×10^{-13})NT_{t-1}+ 0.754731	-1.359047	-0.178256***	0.542732	-7.115873**	2.68×10^{10}
	(0.0116)	(0.0025)	(0.4561)	(0.0143)	(0.2418)
log($M2_{t-1}$) - (5.49×10^{-12})NT_{t-1} - 4.554921	-0.223826	-0.029072	-0.420528	-2.599693**	-3.74×10^{09}
	(0.2358)	(0.1576)	(0.1047)	(0.0116)	(0.6437)
log(FDI_{t-1}) - (2.11×10^{-14})NT_{t-1} - 21.59833	0.064861	-0.003363	-0.024806	-1.258051***	-3.79×10^{09}
	(0.4142)	(0.6970)	(0.8194)	(0.0039)	(0.2670)
Δlog(GDP_{t-1})	0.208310	-0.007589	-0.093287	-1.211700	-1.81×10^{10}**
	(0.3282)	(0.7430)	(0.7487)	(0.2923)	(0.0493)
Δlog(GDP_{t-2})	-0.482758**	-0.004211	0.084915	-1.711561	-1.14×10^{10}
	(0.0322)	(0.8624)	(0.7812)	(0.1573)	(0.2377)
Δlog($GINI_{t-1}$)	-3.181284*	0.514737***	1.345270	-17.04089*	-2.46×10^{10}
	(0.0517)	(0.0042)	(0.5450)	(0.0535)	(0.7243)
Δlog($GINI_{t-2}$)	2.945848*	-0.118687	-1.188829	16.57056**	6.88×10^{10}
	(0.0595)	(0.4826)	(0.5761)	(0.0498)	(0.3033)
Δlog($M2_{t-1}$)	0.111283	0.026154	0.074924	0.887205	3.55×10^{09}
	(0.4733)	(0.1229)	(0.7242)	(0.2902)	(0.5942)
Δlog($M2_{t-2}$)	0.052761	0.012517	-0.257667	0.526418	-6.41×10^{08}
	(0.7070)	(0.4132)	(0.1817)	(0.4877)	(0.9153)
Δlog(FDI_{t-1})	-0.086713	0.005234	-0.021849	0.255458	4.09×10^{09}
	(0.1486)	(0.4216)	(0.7895)	(0.4291)	(0.1130)
Δlog(FDI_{t-2})	-0.016203	0.006961	-0.056968	0.255144	2.54×10^{09}
	(0.7314)	(0.1769)	(0.3788)	(0.3177)	(0.2115)
Δ(NT_{t-1})	-1.06×10^{-11}**	-6.73×10^{-13}	8.36×10^{-12}	-2.14×10^{-11}	0.041626
	(0.0285)	(0.1972)	(0.2031)	(0.4078)	(0.8394)
Δ(NT_{t-2})	-8.45×10^{-12}*	-1.13×10^{-13}	2.45×10^{-12}	-8.90×10^{-12}	0.184008
	(0.0741)	(0.8253)	(0.7041)	(0.7259)	(0.3630)
c	0.097143	-0.003091	0.031740	0.205996	2.23×10^{09}

	(0.0002)	(0.2608)	(0.3583)	(0.1317)	(0.0414)

Note: In parentheses are ρ-values. *, ** and *** denote statistical significance at 90%, 95% and 99% confidence level respectively.

Summary of a VECM system is presented in Table 4.14. The first column lists exogenous variables in each equation. The first four items in this column are the ECTs obtained from cointegrating relations. The following columns list coefficients and ρ-values in each equation of which endogenous variable is listed at the top. The first equation concerns the endogenous variable, $\Delta\log(GDP_t)$. $\Delta\log(GDP_{t-2})$ is found to be statistically significant at 95% confidence level, $\Delta\log(GINI_{t-1})$ and $\Delta\log(GINI_{t-2})$ at 90% significance levels, $\Delta(NT_{t-1})$ and $\Delta(NT_{t-2})$ at 95% and 90% significance levels respectively. In $\Delta\log(GINI_t)$ equation, only $\Delta\log(GINI_{t-1})$ is statistically significant, at 99% confidence level. No variable is found to be significant in the equation of $\Delta\log(M2_t)$. $\Delta\log(GINI_{t-1})$ and $\Delta\log(GINI_{t-2})$ are statistically significant at 90% and 95% confidence levels respectively in explaining $\Delta\log(FDI_t)$. Finally only $\Delta\log(GDP_{t-1})$ is significant, at 95% confidence level, in the last equation which concerns $\Delta(NT_t)$.

To sum up, lagged persistence effect is found in GDP, which emanate from its own lag of order two, first and second lag of Gini coefficient as well as first and second lag of NT. There is persistence in Gini coefficient arising out of its own first lag. First and second lag of Gini coefficient are also significant in explaining FDI, while first lag of GDP seems to influence NT.

Additionally, ECTs are significant at 95% confidence levels for equations where $GINI_t$ and FDI_t are endogenous. This indicates cointegrating relationship exists between $GINI_t$ and FDI_t with the respective exogenous variables. It may be anomalous though, that none of the ECTs for the equation where GDP_t is endogenous is statistically significant while section 4.4 has recognised significance of the correction term. This contradiction may arise out of the fact that in VECM specification, four cointegrating relationships are tested and only one ECT is included in previous ECM. The statistical paradox however, is negated since statistical significance in section 4.4 was soundly established at 95% confidence level.

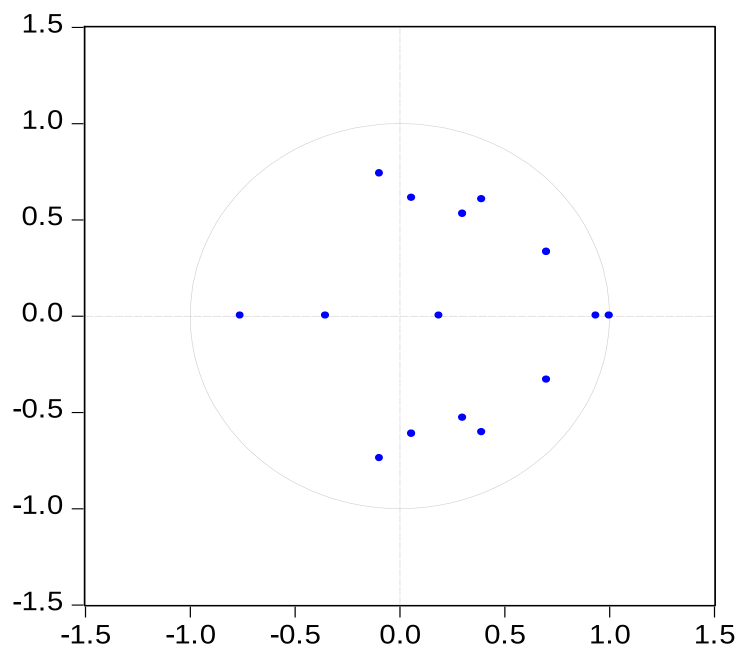

Figure 4.9: Lag Structure AR Roots Graph for VECM

The stability of VECM specified in this section is validated by an AR roots graph. The model is deemed as stable if the modulus of all roots are less than one, which is depicted graphically as points lying inside a unit circle. Figure 4.9 indicates that VECM specified in this paper is indeed stable and inferences derived upon it are valid.

4.6.1 Causality

Deriving from VECM system specified in this chief-section, a granger causality test is conducted, to examine causal linkages at another level. Summary of the results is tabled in the following:

Table 4.15: Granger Causality Test

	Dependent Variable				
	Δlog(GDP_t)	**Δlog($GINI_t$)**	**Δlog($M2_t$)**	**Δlog(FDI_t)**	**Δ(NT_t)**
Δlog(GDP_t)	-	0.9413	0.8950	0.2628	0.0986*
Δlog($GINI_t$)	0.0902*	-	0.8024	0.0834*	0.5656
Δlog($M2_t$)	0.7634	0.2831	-	0.5312	0.8296
Δlog(FDI_t)	0.2177	0.3883	0.5960	-	0.2752
Δ(NT_t)	0.0405**	0.4264	0.4409	0.7031	-

Note: Values are probabilities. *, ** and *** denote statistical significance at 90%, 95% and 99% confidence level respectively.

$GINI_t$ and NT_t are found to granger cause GDP_t at 10% and 5% significance levels respectively. No granger causation that runs towards $GINI_t$ and $M2_t$ is detected. At 90% confidence level, $GINI_t$ granger causes FDI_t and GDP_t granger causes NT_t. There are hence, short-run unidirectional causalities that run from $GINI_t$ to GDP_t, and $GINI_t$ to FDI_t. Meanwhile, bidirectional causality is detected between NT_t and GDP_t. Causality results may be compressed notationally as $GINI_t \rightarrow GDP_t$, $GINI_t \rightarrow FDI_t$ and $NT_t \leftrightarrow GDP_t$.

4.6.2 Impulse Responses

VECM specification enables researchers to examine the impact of exogenous increase of variables on endogenous variables. This may be represented by impulse response functions (IRF). In line with results in section 4.6, impulse responses on $GINI_t$ and FDI_t are examined.

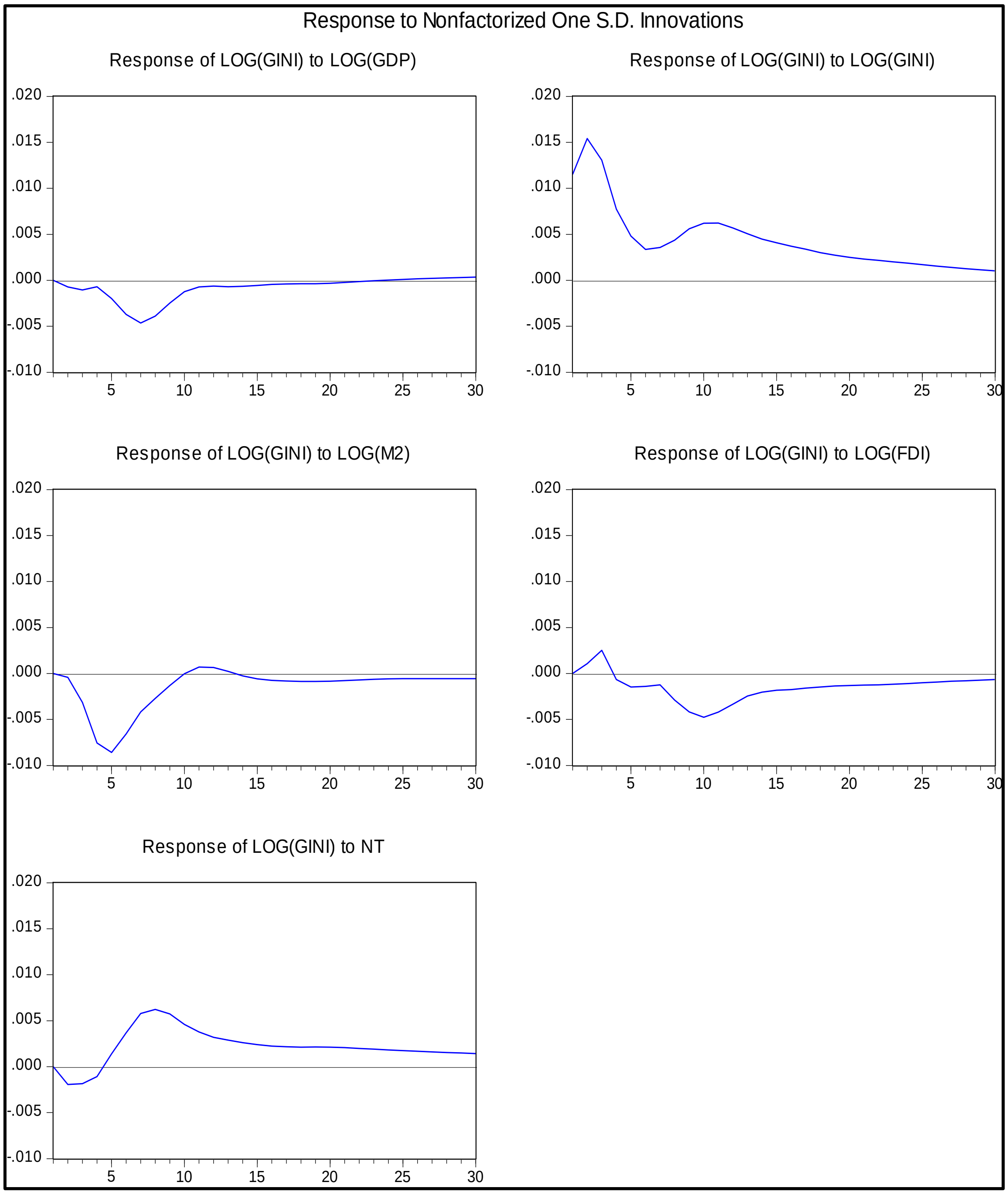

Figure 4.10: Impulse Response of One Standard Deviation Shocks on Gini Indices

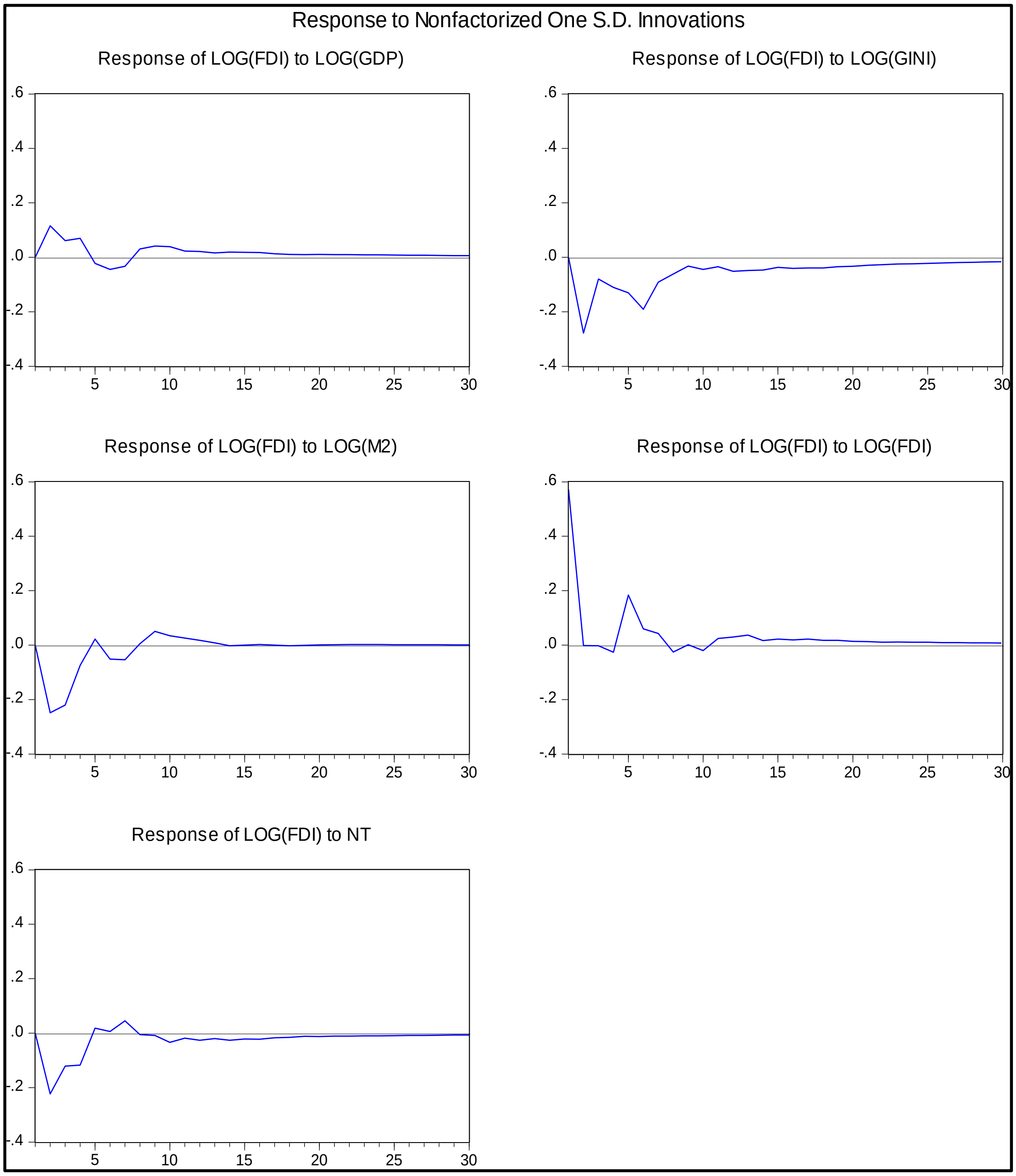

Figure 4.11: Impulse Response of One Standard Deviation Shocks on FDI

Figure 4.10 displays IRF of $GINI_t$. The impact of one standard deviation exogenous increase in GDP_t is relatively benign within the first four periods. The absolute magnitude reaches its peak in the seventh period, dying out gradually afterwards. The net effect on $GINI_t$ is negative. Meanwhile, response in $GINI_t$ from its own exogenous increase is greater and lasts longer, which is indicated by a slow and an extremely gradual decline of the IRF. Net effect of its own shock is positive. A one standard deviation shock in $M2_t$ induces a negative response in $GINI_t$, which dies out after the fifth period. Exogenous increase in FDI_t causes a positive response within the first 3 periods and turns negative afterwards. The effect dies out after the tenth period, although at an extremely slow pace. The immediate response in $GINI_t$ from one standard deviation shock in NT_t is negative within the first five periods and turns positive afterwards. The effect dies out at an extremely slow pace after the eight period.

Figure 4.11 displays the IRF for FDI_t. One standard deviation shock in GDP_t induces positive response in FDI_t which dies out after the second period. Note however, between the fifth and eight period, the effect on FDI_t is negative. The impulse response in FDI_t from one standard deviation shock in $GINI_t$ is negative and begins to die out after the second period. Exogenous increase in $M2_t$ induces a negative response in FDI_t, of which effect starts to die out after the second period. FDI_t responses positively to one standard deviation shock of its self and starts to display declining response immediately after the shock period. Finally, one standard deviation exogenous increase in NT_t induces a negative response in FDI_t, of which effect dies out after the second period. At this point, it would be beneficial to note that exogenous increase in variables induce relatively longer lasting effect on $GINI_t$ as opposed to FDI_t.

4.7 Cointegrating Regressions

Though analysis thus far proves that OLS estimation has been adequate in estimating model employed, this paper delves into further empirical investigation by comparing three alternative estimation methods. Fully Modified Ordinary Least Squares, Canonical Cointegrating Regression and Dynamic Ordinary Least Squares offer more efficient long-run equilibrium estimates for cointegrated variables.

Table 4.16: Cointegrating Regressions

	Estimation Method		
Variable	**FMOLS**	**CCR**	**DOLS**
c	14.01624	13.99444	13.47208
	(0.727489)	(0.722895)	(0.852468)
log($GINI_t$)	-0.357419	-0.438706	0.059469
	(0.72341)	(0.665166)	(0.948708)
log($M2_t$)	0.653909***	0.614700***	0.646237***
	(0.130133)	(0.120671)	(0.193804)
log(FDI_t)	0.348847***	0.355269***	0.391346***
	(0.038694)	(0.041835)	(0.047598)
NT_t	1.67×10^{-11}***	1.71×10^{-11}***	1.65×10^{-11}***
	(2.21×10^{-12})	(2.26×10^{-12})	(2.13×10^{-12})
$\bar{R}^2$	0.920905	0.928005	0.970928
Durbin-Watson Statistics	1.752895	1.762570	1.251187
Sum Error of Regression	0.182246	0.183279	0.132729
Jarque-Bera Probability	0.245963	0.172609	0.649337

Note: Values in parentheses are standard errors. *, ** and *** denote statistical significance at 90%, 95% and 99% confidence level respectively.

Table 4.16 summarises output for the three cointegrating regressions. FMOLS predicts an opposite direction change of 0.35% in GDP_t from a percentage increase in

$GINI_t$. Percentage increase in $M2_t$ and FDI_t is expected to increase GDP_t by 0.65% and 0.35% respectively. A unit increase in NT_t is expected to induce GDP_t increment of 1.67×10^{-9} or US$ 1. $\bar{R}^2$ indicates that 92.09% of GDP_t variations is explained by the model. $M2_t$, FDI_t and NT_t are all statistically significant at 99% confidence level. Given number of parameters and observations, d_L and d_U are 1.29584 and 1.72048 respectively. Since Durbin-Watson statistics, d is 1.75, the model is concluded to be free of serial correlation.

A percentage increase in $GINI_t$ is estimated to induce a decline in GDP_t by 0.44% in CCR estimation. GDP_t increases by 0.61% and 0.36% from a percentage positive change in $M2_t$ and FDI_t respectively and increases by 1.71×10^{-9}% or US$ 1 from a unit increase in NT_t. Approximately 92.8% variations are captured by the model and serial correlation is not a problem, since d is 1.76, well above d_U. Similarly, $M2_t$, FDI_t and NT_t are statistically significant at 99% confidence level.

DOLS estimation predicts a positive relationship between GDP_t and $GINI_t$, with a magnitude of 0.059%. This is in contrast to relationship obtained from the first two estimations. Consistent with FMOLS and CCR, positive relationship is observed between $M2_t$ and FDI_t with GDP_t, of which magnitude are 0.65% and 0.39% respectively. A unit increase in NT_t is projected to increase GDP_t by 1.65×10^{-9}% or US$ 1. $\bar{R}^2$ value of 0.97 suggests an extremely good fit. Durbin-Watson's d however, indicates that the estimated model suffers from serial correlation. d value is 1.25, lower than d_L value of 1.27, thereby unambiguously rejecting null hypothesis of Durbin-Watson test. Note that DOLS estimation contains 39 observations, a result of adjustments in leads and lags, thus the difference in Durbin-Watson critical values.

Since model generated with DOLS estimation technique suffers from serial correlation, it is probably not the best of the three. Although Jarque-Bera probability rejects null hypothesis of normality for all models, the values indicate that CCR estimation is the closest to producing residuals that resemble normal distribution. A point to note is that, rejection of normality in small sample is common, leading to Type I error of hypothesis testing. This section therefore concludes that CCR procedure produces the most desirable result in estimation of the cointegrated series.

Table 4.17: Cointegrating Regression Cointegration Tests

		Estimation Method		
Test	**Null Hypothesis**	**FMOLS**	**CCR**	**DOLS**
Hansen Parameter Instability	Series are cointegrated	0.1838	>0.2000	> 0.2000
Engle-Granger	Series are not cointegrated	0.0370**	0.0370**	0.0370**
Phillips-Ouliaris	Series are not cointegrated	0.0467**	0.0467**	0.0467**

Note: Values presented are probabilities of statistics. *, ** and *** denote statistical significance at 90%, 95% and 99% confidence level respectively.

Special tests were performed on the cointegrating regressions. Summary for the tests is provided in Table 4.17. Probabilities for Hansen Parameter Instability test statistics are greater than 0.05, failing to reject null hypothesis of cointegrated series for all three methods. Additionally, probabilities for Engle-Granger and Phillips-Ouliaris test statistics for all estimations are less than 0.05, rejecting null hypotheses of non-cointegrated series at 95% confidence level. Hence, the three additional tests lend rigour in proving that variables in this paper’s model are indeed cointegrated.

4.8 Gini Coefficient and Moderating Variables

This section is dedicated to examine indirect linkages between financial development, FDI and trade with growth, that operate through income inequality. Note that prior to estimations in this section, the variables have been standardized in order to eliminate multicollinearity that arises from such specification as employed here. Additionally, AR(1) terms were included to eliminate serial correlation by Marquardt algorithm.

Table 4.18: Moderating Variables Regressions

Variable	Moderator		
	Financial Development	**Foreign Direct Investment**	**Trade**
c	-1.387570	676.5334	-1.953938
	(1.015550)	(179356.1)	(1.455931)
$GINI_t$	0.094648	0.031240	0.044422
	(0.161019)	(0.133345)	(0.163387)
$M2_t$	-0.042221		
or	(0.116537)		
FDI_t		0.155193**	
or		(0.073725)	
NT_t			-0.081182
			(0.145422)
$GINI_t{*}M2_t$	0.102029		
or	(0.126315)		
$GINI_t{*}FDI_t$		-0.060970	
or		(0.081158)	
$GINI_t{*}NT_t$			-0.151925
			(0.147567)
AR(1)	1.074336***	0.999875***	1.055793***
	(0.040641)	(0.033223)	(0.038859)
Durbin-Watson	2.129156	1.535736	2.111671
ARCH Test Statistic Probability	0.2905	0.8846	0.1608
Jarque-Bera Probability	0.0000	0.001330	0.0000

Note: Values in parentheses are standard errors. *, ** and *** denote statistical significance at 90%, 95% and 99% confidence level respectively.

Preceding table summarises three regressions concerning moderator variable effects. Of interest in examining moderating effects, are coefficients for $GINI_t$ and interaction term between $GINI_t$ and the corresponding moderating variable. The first equation pertains to financial development's role in the Gini coefficient and GDP relationship. One standard deviation increase in $GINI_t$ is expected to change GDP_t by (0.095 + 0.102 $M2_t$) standard deviation. Number of observations used is 41 and parameters are 5, which correspond to d_L and d_U values of 1.29584 and 1.72048 respectively. Since d = 2.13 is between two and 4 – d_U = 2.28, Durin-Watson test rules out serial correlation. Additionally, ARCH test statistic probability and Jarque-Bera probability indicate that the model is homoskedastic and samples are selected from a normally distributed population.

On moderating role of FDI, it is expected that one standard deviation increase in $GINI_t$ results in (0.031 - 0.061 FDI_t) standard deviation change in GDP_t. Value of Durbin-Watson statistics, d is 1.54 which falls between d_L = 1.29584 and d_U = 1.72048, thus conclusion on existence of serial correlation is inconclusive. ARCH test statistic probability of 0.8846 rules out heteroskedasticity and Jarque-Bera probability of 0.00133 indicates normally distributed samples.

Meanwhile on moderating effect of NT_t, one standard deviation in $GINI_t$ is predicted to change GDP_t by (0.044 – 0.15 NT_t). Since d value is 2.11, the model is deemed to be free of serial correlation. ARCH test statistic probability is 0.16, thus null hypothesis of homoskedastic residuals is not rejected. Moreover, Jarque-Bera probability of nil indicates normality of residuals.

As noted earlier, coefficient of interaction terms are central in this section. The parameters represent moderating effect that the respective variables have on $GINI_t$ in influencing GDP_t. For instance in the first regression, GDP_t is expected to change by (0.095 + 0.102 $M2_t$) standard deviation from a standard deviation increase in $GINI_t$. Notice that the net effect will be influenced by value of $M2_t$. As $M2_t$ increases, $GINI_t$ exerts greater influence on GDP_t. Hence, financial development supplements income inequality effects on growth. With respect to the second regression, of which effect of a standard deviation increase in $GINI_t$ on GDP_t is (0.031 - 0.061 FDI_t) standard deviation, a different mechanism is at hand. The coefficient of interaction term between $GINI_t$ and FDI_t is negative. Thus, the effect of income inequality is dampened by FDI_t. The greater is the change in FDI_t, the more insignificant is the effect of change in $GINI_t$ on GDP_t. Furthermore, beyond a certain threshold value, the net effect will be negative. Similar argument holds for the moderating effect of NT_t. The associated change in GDP_t from a standard deviation increase in $GINI_t$ is (0.044 – 0.15 NT_t) standard deviation. Again, the interaction term between moderator and $GINI_t$ is negative, leading to opposing forces and a net negative effect on GDP_t, as NT_t crosses the threshold.

Interpretation of moderation effects in this section however, needs to be at the discretion of readers. This is because on all accounts of acceptable significance levels, parameters of the interaction terms are not statistically significant. The results obtained here however, shed light on indirect linkages that may exist between financial development, FDI and trade on growth, via income inequality.

5 DISCUSSION ON FINDINGS

This chapter presents discussion on findings made in preceding chapter. Emphasis will be made on regression results, cointegration and causal linkages.

5.1 Regression Results

Chapter 4 provides detailed interpretations of estimated coefficients. This section hence focuses on qualitative aspects of the regressions. Effectively, four estimation methods were employed on the general empirical model specified in section 3.5.2. One of the regression method used was the standard OLS. Additional three cointegrating regression methods namely FMOLS, CCR and DOLS were employed to more efficiently estimate the long-run equilibrium of the model.

The first estimation utilises standard OLS procedure, which is presented in section 4.2. Three models were estimated, each specifying different measurements for financial development. This is in appreciation of argument forwarded by Kar et al. (2011), of which article finds differing conclusion on relationship between growth and financial development on the basis of indicator used in analysis. With respect to Model 1 which specifies financial development as domestic credit provided by banking sector as a percentage of GDP, a positive relationship is observed between output and financial progress. This supports findings by Liu and Hsu (2006), Hassan et al. (2011) as well as Liang and Teng (2006). This paper hence, lends rigour to the argument that financial development promotes economic growth, particularly for Malaysia. Financial intermediation fulfils purposes such as improvement in resource allocation through transfer of funds (D.-H. Kim, et al., 2012;

Misati & Nyamongo, 2012). Progress in financial sector improves efficiency in this process and enables an economy to achieve higher output, as found in this paper. Moreover, this finding is found to be robust across different measurements of financial development. Model 2 for instance, utilises domestic credit provided to private sector as a percentage of GDP to measure financial development also indicates positive association between financial progress and output growth. Similarly, a positive relationship is observed in Model 3, which specifies financial development as, M2 as a percentage of GDP. Results of FMOLS, CCR and DOLS mirror that of the three OLS Models.

With respect to income inequality which is captured by the variable $GINI_t$ in all three estimated models, the results are mixed. Model 1 and Model 3 predicts that increase in income inequality will result in a decline in output. This is in concordance to findings of Sukiassyan (2007), Scully (2003) and Qin et al. (2009). Additionally, FMOLS and CCR estimation techniques were found to be consistent to predictions of Model 1 and Model 3. Reducing income inequality, thus increasing equity is achievable without at the expense of economic growth. In other words, there is no trade-off between equity and efficiency. Basing judgement on Model 2 on the other hand, increasing income inequality i.e. reducing equity is positively associated with output growth. DOLS estimation also produces a positive outcome in the interaction between income inequality and output growth. This finding may conform to arguments forwarded by neoliberal theorists which postulate that income inequality to a certain extent is beneficial to output growth, of which effect materialises through productivity encouragement. Alternatively, it may be explained by the initial capital endowment argument as forwarded by García-Peñalosa and Turnovsky

(2005). Additionally, higher tax rates and technological progress are also among the channels cited to explain this positive relationship (García-Peñalosa & Turnovsky, 2005). Note however, estimated coefficient for Gini index is not statistically significant across all estimation techniques. Therefore interpretations on income inequality need to be taken with caution. Section 6.2.1 discusses policy implications of this finding.

Relationship between output and FDI has been robust across several dimensions in this paper. The three OLS models estimate a positive relationship between FDI and output growth. Moreover, the coefficients are statistically significant at 99% confidence levels. In addition, FMOLS, CCR and DOLS estimations echo the relationship estimated in OLS procedure. This strong positive relationship confirms findings of Li and Liu (2005), Yao and Wei (2007) and in particular Ahmed (2012) who found positive relationship between FDI and growth in Malaysia to be input-driven. FDI influences growth in Malaysia primarily through human capital formation, labour force and physical capital (Ahmed, 2012). This is not surprising as the same factors are essential in growth process. FDI develops the essential inputs, making higher output growth attainable.

Trade also exhibits robust positive relationship with economic growth. OLS, FMOLS, CCR and DOLS procedures estimate that increase in trade, measured by NT_t, induces output growth. This finding is substantiated by Bojanic (2012) and Shahbaz (2012). Apart from the conventional channel where trade expands consumption possibility frontier, there is also the possibility of a link between trade and productivity as proposed by E. Kim (2000). Domestic firms that are open to foreign competition find the incentive to increase efficiency, hence productivity, appealing. This results from consumers' access to greater variety, thereby encouraging domestic firms to compete for domestic market share. More importantly perhaps, is the fact that trade expands production possibility frontier of domestic firms. Access to global market enables firms to produce at a larger scale, rendering benefits of scale economies possible. The different channels of which trade operates share a common denominator, that is they generate higher output growth. Thus, positive relationship predicted in this paper's estimations is backed by both, theory and empirical evidence.

In section 4.4, results of ECM estimation were presented. It has been noted therein that $M2_t$ and NT_t which were statistically significant in the cointegration regressions are no longer significant in ECM specification. Note that insignificance of trade in short-run specification answers a research problem stipulated in section 1.2, where a long-run covariance was acknowledged, but short-run relationship was questioned. Meanwhile, the direction of change in output has turned positive with respect to income inequality and negative for trade. The positive relationship between income inequality and output in short-run specification is supported by García-Peñalosa and Turnovsky (2005). Unaccommodative tax rates for instance, thwart human capital formation, which is essential for growth. The negative relationship between trade and growth may be the result of measure used to represent trade, which is net trade. The negative association implies that a reduction in trade surplus position or even a gain in trade deficit in the short-run, is beneficial for the economy. This may be due to the fact that significant portion of Malaysia's manufacturing sector are involved in vertical supply chain, where parts and components are imported to produce output that are in turn exported. Therefore in the short-run, increase in import i.e. decline in net trade translates into higher output, underpinned by manufacturers involved in vertical supply chain. Expanding the process into long-run horizon, domestically manufactured goods which use imported inputs are exported, generating a positive relationship in the long-run. This view mirrors arguments forwarded by Hummels et al. (2001). Note that ECM specification generated a negative ECT coefficient, implying that the model corrects short-run discrepancies, achieving equilibrium in the long-run. The negative sign is necessary, indicating that there is no short-run misspecification (Antzoulatos, 1996). Additionally, based on VECM specified in section 4.6, this paper infers that shocks generate persistent impulse responses with regard to $GINI_t$. Impulse responses of FDI_t on the other hand, last for period shorter than that of $GINI_t$. This may be a result of income inequality stickiness which renders it harder to correct its self from exogenous changes.

5.2 Cointegrating Relationships

Empirical model cointegration as well as pairwise cointegration was examined in section 4.3. Residual based ADF test and Johansen cointegration test on OLS estimation indicate that the model exhibits long-run equilibrium. In other words, there is at least one cointegrating vector among GDP_t, $GINI_t$, $M2_t$, FDI_t and NT_t. This is substantiated by Hansen Parameter Instability, Engle-Granger and Phillips-Ouliaris cointegration tests performed on FMOLS, CCR and DOLS estimations. The specified model is therefore relevant in explaining long-run variations in Malaysia's output.

Engle-Granger cointegration test indicate pairwise cointegration between GDP_t and FDI_t, $GINI_t$ and FDI_t as well as $M2_t$ and FDI_t. This paper's findings hence supports that of Ang and McKibbin (2007), which proved long-run relationship between FDI and Malaysia's economic growth. Spillover, productivity and input enhancement are among the channels of which a long-run relationship between the two persists (Ito, et al., 2012; Ouyang & Fu, 2012; Yao & Wei, 2007). Additionally, this paper contributes to literature, by proving that long-run relationship is also existent between FDI with income inequality and financial development. Cointegration between FDI and financial development is due to supplementary roles played in promoting output growth (Choong, 2011). A well-developed financial market ensures investments, including FDI are utilised optimally. This induces the two variables to move in sync in the long-run. Cointegration between FDI and income inequality may be explained by the argument that foreign investments typically induce inflow of homogenous-skilled tasks. Depending in the nature of tasks created by the FDI inflows, wage gap between high-skilled and low-skilled workers will widen, thus increasing income inequality (Chintrakarn, Herzer, & Nunnenkamp, 2010). On the other hand, certain FDI may be attracted to low inequality condition, favouring stability over low-labour cost.

5.3 Causal Linkages

Causality test was performed on all variables and presented in section 4.6.1. Unidirectional causality run was detected from $GINI_t$ to GDP_t, and $GINI_t$ to $FDI_{t.}$. Meanwhile, bidirectional causality is evident between NT_t and GDP_t.

Since a negative relationship between inequality and growth is the predominant finding in this paper, causal link is explained in the context of equity-efficiency non-trade-off. An exogenous increase in income inequality may result in political or social instability. This may result in disruption in various economic activities, hence output (Shin, 2012). Increment in income inequality also affects economic growth through investment channel, where prevailing unequal opportunities discourages savings and therefore investment, which will in turn reduce output growth. In explaining causal link between income inequality and FDI, arguments may be derived from proposition forwarded by Chintrakarn et al. (2010). Foreign firms that intend to commit in a direct investment generally seek low labour cost. Thus an increase in income inequality stemming from a low wage rate of lower income earners will attract FDI, explaining causal link between the two.

Causal link that runs from trade to output growth may be explained by channels of productivity inducement, expansion of consumption possibility frontier and production possibility frontier as discussed in section 5.1 The fact that trade need to increase before these intermediate factors translate into higher output growth explains how trade granger cause output growth. The causal feedback from growth to trade may be explained by scale economies, efficiency and comparative advantage (Kónya, 2006). Aforementioned intermediate variables are the outcome of output growth. The same factors also induce trade flows, providing a causal link that runs from output growth to trade. Note however, the existence of causal link between trade and output for Malaysia is in contrast to findings of Lean and Smyth (2010), a discrepancy that may arise out of trade representation.

6 CONCLUSION

This chapter summarises empirical findings made in this paper. As the mechanics of relationship found has been discussed in previous chapter, emphasis here is placed on answering research objectives delineated earlier. Additionally, implications of the paper's findings are discussed.

6.1 Conclusions and Implications

As has been noted in preceding chapter, several estimation techniques were employed to examine the relationship among variables in this paper. With respect to income inequality, a negative relationship with economic growth is found under OLS, FMOLS and CCR estimations. This implies that there is no trade-off between equity and efficiency, specifically for Malaysia. This is expected because the country's development is suspected to not have reached the threshold where a positive relationship is anticipated, where increase in inequity increases economic growth. Hence, it is possible to pursue income inequality reduction policies, while maintaining favourable growth prospects. Although DOLS estimation produces a positive relationship, this paper places faith on negative relationship on the basis that: (i) results produced by OLS have undergone rigorous empirical scrutiny and (ii) OLS results are substantiated by the other two additional cointegrating regression estimation as in section 4.7. The relationship between FDI and growth has been established as positive in this paper. All four estimation methods namely OLS, FMOLS, CCR and DOLS find that FDI spurs economic development. Thus, it would be of interest for Malaysia to encourage direct investment inflow in the long-run.

Financial development is positively associated with economic growth. This finding is found to be robust across several measurements of financial development employed in this paper namely domestic credit provided by banking sector as a percentage of GDP, domestic credit provided to private sector as a percentage of GDP and M2 as a percentage of GDP. Moreover, additional cointegrating regression methods ascertain this relationship. A positive relationship is also found between trade and growth, a finding robust across all estimation methods. It is also important to highlight that statistical significance on affecting output growth is achieved for FDI, financial development and trade.

ADF, Johansen, Hansen Parameter Instability, Engle-Granger and Phillips-Ouliaris cointegration tests indicate a long-run relationship in the model employed in this paper. Explanatory variables considered within this study's framework are therefore relevant in explaining long-run variations in Malaysia's output. Focus on maintaining favourable conditions with respect to income inequality, FDI, financial development and trade will consequently serve Malaysia's economic development well. Additionally, bivariate long-run relationship is also found between growth and FDI, income inequality and FDI as well as financial development and FDI. This provides an indirect link between the considered variables with output.

Having dealt with long-run relationships, this paper delves into short-run relationships. With regard to regression results, financial development and trade are not significant determinants in the short-run. Additionally, sign of change with respect to income inequality and trade in short-run is the reverse to that of found in long-run specification. Explanations for these findings have been discussed in section 5.1.

On the issue of causal relationship, this paper finds proof of unidirectional causality from income inequality to growth and income inequality to FDI. Variations in income inequality are therefore expected to cause changes in growth and FDI. Meanwhile, bidirectional causality is detected between trade and growth, making a two-way causation possible. It is therefore imperative that favourable short-run conditions of income inequality and trade is in check to ensure stable economic progress.

On a side note, examination on IRF reveals that exogenous shocks are likely to generate more lasting effects on income inequality than on FDI. Actions that alter variables that adversely affect income inequality hence are relatively more damaging. Finally, this paper's experimentation on moderating effects of financial development, trade and FDI on equity-efficiency nexus fails to find any significant relationship.

This study has therefore managed to address research problems and objectives stipulated in the first chapter of the paper.

6.2 Recommendations

In line with conclusions and implications derived, this author proposes several suggestions that serve the interest of policy makers and academics.

6.2.1 Policy

Since FDI, financial development and trade have been proven to transmit significant implications on long-term economic growth, it would hence be in the best interest for policy makers to monitor the developments of aforementioned variables. In light of increasing competition for FDI from low-cost countries like China, Indonesia and Vietnam and newly liberalised economies like Myanmar, this author suggests that policy makers press on FDI inflow inducement policies that are targeted to improve productivity. The recommendation to compete for foreign investments is derived from this paper's findings, that FDI continually exhibit robust positive relationship with growth, both in short- and long-term prospects. Similarly, development of financial sector and trade needs to be stressed upon, for Malaysia to maintain strong growth momentum.

Although historical data analysis indicates that income inequality is not a significant determinant, this author argues that proper equity enhancement has the potential to significantly promote economic growth. As has been highlighted earlier in this paper, income inequality reduction policies in this country have been largely targeted to reducing inter-ethnic income inequality. Thus, Gini indices which measure household income inequality irrespective of ethnicity naturally does not vary much since the policies pursued probably did not address an underlying equity problem. Basing judgement on ample empirical and theoretical studies discussed in this paper, this author hence argues that equity enhancement policies that are targeted to reduce inter-personal income inequality should be pursued, in order to achieve greater economic development. This is possible as this paper finds no proof of equity-efficiency trade-off for Malaysia.

This paper has demonstrated that apart from the direct link between FDI, income inequality, financial development with growth, there is a bivariate long-run relationship between FDI and growth, income inequality and FDI as well as financial development and FDI. Another policy perspective is hence, economic equity and financial development is crucial to FDI and hence growth. This is not to state that development efforts should be exclusively for the two, rather it is to acknowledge that polices meant to develop the financial sector and improve economic equity has the potential to complement FDI inflow attraction, which ultimately leads to economic growth.

6.2.2 Academia

This paper provides path for prospecting research into similar area of studies. It would be interesting to critically analyse the effects of income inequality and financial development on FDI. This proposal stems from a long-run relationship found between the two explanatories with FDI. Evidence of significant relationship would provide insights for policy makers on effort to encourage FDI inflows.

On the equity-efficiency nexus, this author suggests that perhaps advanced estimation method such as Generalised Method of Moments (GMM) could be used to analyse the effects of income inequality on economic growth in a bivariate framework, to more efficiently capture the underlying relationship between the two. As such, income inequality effects could be analysed with greater detail, incorporating urban-rural, inter-regional as well as inter-ethnicity settings.

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APPENDICES

Appendix 1 - ADF Unit Root Test at Level for GDP

Null Hypothesis: GDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.799240	0.9996
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 01/03/13 Time: 09:42
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	0.069231	0.038478	1.799240	0.0797
C	-1.35E+08	3.70E+09	-0.036593	0.9710

R-squared	0.076645	Mean dependent var	5.53E+09
Adjusted R-squared	0.052969	S.D. dependent var	1.28E+10
S.E. of regression	1.24E+10	Akaike info criterion	49.37491
Sum squared resid	6.04E+21	Schwarz criterion	49.45850
Log likelihood	-1010.186	Hannan-Quinn criter.	49.40535
F-statistic	3.237265	Durbin-Watson stat	2.185356
Prob(F-statistic)	0.079722		

Null Hypothesis: GDP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.196641	0.9910
Test critical values:	1% level	-4.198503	
	5% level	-3.523623	
	10% level	-3.192902	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 01/03/13 Time: 09:44
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	-0.020456	0.104026	-0.196641	0.8452
C	-1.45E+09	3.97E+09	-0.365489	0.7168
@TREND(1970)	4.12E+08	4.44E+08	0.928235	0.3591

R-squared	0.097117	Mean dependent var	5.53E+09
Adjusted R-squared	0.049597	S.D. dependent var	1.28E+10
S.E. of regression	1.25E+10	Akaike info criterion	49.40127
Sum squared resid	5.91E+21	Schwarz criterion	49.52665
Log likelihood	-1009.726	Hannan-Quinn criter.	49.44693
F-statistic	2.043700	Durbin-Watson stat	2.052112
Prob(F-statistic)	0.143548		

Null Hypothesis: GDP has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		3.409701	0.9997
Test critical values:	1% level	-2.622585	
	5% level	-1.949097	
	10% level	-1.611824	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 01/03/13 Time: 09:44
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	0.068033	0.019953	3.409701	0.0015

R-squared	0.076613	Mean dependent var	5.53E+09
Adjusted R-squared	0.076613	S.D. dependent var	1.28E+10
S.E. of regression	1.23E+10	Akaike info criterion	49.32617
Sum squared resid	6.04E+21	Schwarz criterion	49.36796
Log likelihood	-1010.186	Hannan-Quinn criter.	49.34138
Durbin-Watson stat	2.182819		

Appendix 2 - ADF Unit Root Test at Level for GINI Index

Null Hypothesis: GINI has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.562253	0.4922
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GINI)
Method: Least Squares
Date: 01/03/13 Time: 09:45
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GINI(-1)	-0.045484	0.029115	-1.562253	0.1267
D(GINI(-1))	0.571674	0.132125	4.326769	0.0001
C	0.020730	0.013890	1.492491	0.1440

R-squared	0.350747	Mean dependent var	-0.001905
Adjusted R-squared	0.315652	S.D. dependent var	0.007340
S.E. of regression	0.006072	Akaike info criterion	-7.298145
Sum squared resid	0.001364	Schwarz criterion	-7.171479
Log likelihood	148.9629	Hannan-Quinn criter.	-7.252346
F-statistic	9.994288	Durbin-Watson stat	1.751236
Prob(F-statistic)	0.000339		

Null Hypothesis: GINI has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.447077	0.3513
Test critical values:	1% level	-4.205004	
	5% level	-3.526609	
	10% level	-3.194611	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GINI)
Method: Least Squares
Date: 01/03/13 Time: 09:46
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GINI(-1)	-0.133756	0.054659	-2.447077	0.0194
D(GINI(-1))	0.618528	0.130191	4.750938	0.0000
C	0.069072	0.028961	2.385054	0.0225
@TREND(1970)	-0.000294	0.000156	-1.884244	0.0676

R-squared	0.409030	Mean dependent var	-0.001905
Adjusted R-squared	0.359782	S.D. dependent var	0.007340
S.E. of regression	0.005873	Akaike info criterion	-7.342201
Sum squared resid	0.001242	Schwarz criterion	-7.173313
Log likelihood	150.8440	Hannan-Quinn criter.	-7.281136
F-statistic	8.305583	Durbin-Watson stat	1.814857
Prob(F-statistic)	0.000250		

Null Hypothesis: GINI has a unit root
Exogenous: None
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.016829	0.2728
Test critical values:	1% level	-2.624057	
	5% level	-1.949319	
	10% level	-1.611711	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GINI)
Method: Least Squares
Date: 01/03/13   Time: 09:46
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GINI(-1)	-0.002141	0.002106	-1.016829	0.3157
D(GINI(-1))	0.548228	0.133290	4.113055	0.0002

R-squared	0.311660	Mean dependent var	-0.001905
Adjusted R-squared	0.293546	S.D. dependent var	0.007340
S.E. of regression	0.006170	Akaike info criterion	-7.289684
Sum squared resid	0.001446	Schwarz criterion	-7.205240
Log likelihood	147.7937	Hannan-Quinn criter.	-7.259151
Durbin-Watson stat	1.702971		

Appendix 3 - ADF Unit Root Test at Level for Domestic Credit Provided by Banking Sector

Null Hypothesis: BNKCDT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.995594	0.2876
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BNKCDT)
Method: Least Squares
Date: 01/03/13 Time: 09:48
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BNKCDT(-1)	-0.111910	0.056078	-1.995594	0.0530
C	14.14044	6.166795	2.292997	0.0273

R-squared	0.092652	Mean dependent var	2.689457
Adjusted R-squared	0.069386	S.D. dependent var	14.99437
S.E. of regression	14.46481	Akaike info criterion	8.228866
Sum squared resid	8160.002	Schwarz criterion	8.312454
Log likelihood	-166.6917	Hannan-Quinn criter.	8.259304
F-statistic	3.982394	Durbin-Watson stat	1.853476
Prob(F-statistic)	0.052997		

Null Hypothesis: BNKCDT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.046576	0.5591
Test critical values:	1% level	-4.198503	
	5% level	-3.523623	
	10% level	-3.192902	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BNKCDT)
Method: Least Squares
Date: 01/03/13 Time: 09:49
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BNKCDT(-1)	-0.198309	0.096898	-2.046576	0.0477
C	15.41588	6.261528	2.462000	0.0185
@TREND(1970)	0.360250	0.329896	1.092013	0.2817

R-squared	0.120259	Mean dependent var	2.689457
Adjusted R-squared	0.073957	S.D. dependent var	14.99437
S.E. of regression	14.42925	Akaike info criterion	8.246747
Sum squared resid	7911.721	Schwarz criterion	8.372130
Log likelihood	-166.0583	Hannan-Quinn criter.	8.292405
F-statistic	2.597272	Durbin-Watson stat	1.757397
Prob(F-statistic)	0.087647		

Null Hypothesis: BNKCDT has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.358175	0.7836
Test critical values:	1% level	-2.622585	
	5% level	-1.949097	
	10% level	-1.611824	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BNKCDT)
Method: Least Squares
Date: 01/03/13 Time: 09:49
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BNKCDT(-1)	0.007740	0.021608	0.358175	0.7221

R-squared	-0.029674	Mean dependent var	2.689457
Adjusted R-squared	-0.029674	S.D. dependent var	14.99437
S.E. of regression	15.21521	Akaike info criterion	8.306556
Sum squared resid	9260.102	Schwarz criterion	8.348350
Log likelihood	-169.2844	Hannan-Quinn criter.	8.321775
Durbin-Watson stat	1.839235		

Appendix 4 - ADF Unit Root Test at Level for Domestic Credit to Private Sector

Null Hypothesis: PVTCDT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.527043	0.5101
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(PVTCDT)
Method: Least Squares
Date: 01/03/13 Time: 09:50
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PVTCDT(-1)	-0.058462	0.038284	-1.527043	0.1348
C	7.396549	3.648554	2.027255	0.0495

R-squared	0.056418	Mean dependent var	2.358394
Adjusted R-squared	0.032224	S.D. dependent var	10.13928
S.E. of regression	9.974584	Akaike info criterion	7.485508
Sum squared resid	3880.200	Schwarz criterion	7.569097
Log likelihood	-151.4529	Hannan-Quinn criter.	7.515947
F-statistic	2.331861	Durbin-Watson stat	1.701510
Prob(F-statistic)	0.134821		

Null Hypothesis: PVTCDT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.170020	0.9035
Test critical values:	1% level	-4.198503	
	5% level	-3.523623	
	10% level	-3.192902	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(PVTCDT)
Method: Least Squares
Date: 01/03/13 Time: 09:51
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PVTCDT(-1)	-0.088333	0.075497	-1.170020	0.2493
C	7.458957	3.688458	2.022243	0.0502
@TREND(1970)	0.119612	0.259626	0.460709	0.6476

R-squared	0.061659	Mean dependent var	2.358394
Adjusted R-squared	0.012273	S.D. dependent var	10.13928
S.E. of regression	10.07687	Akaike info criterion	7.528718
Sum squared resid	3858.648	Schwarz criterion	7.654102
Log likelihood	-151.3387	Hannan-Quinn criter.	7.574376
F-statistic	1.248507	Durbin-Watson stat	1.661443
Prob(F-statistic)	0.298436		

Null Hypothesis: PVTCDT has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.690705	0.8609
Test critical values:	1% level	-2.622585	
	5% level	-1.949097	
	10% level	-1.611824	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(PVTCDT)
Method: Least Squares
Date: 01/03/13 Time: 09:51
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PVTCDT(-1)	0.011721	0.016969	0.690705	0.4937

R-squared	-0.043015	Mean dependent var	2.358394
Adjusted R-squared	-0.043015	S.D. dependent var	10.13928
S.E. of regression	10.35506	Akaike info criterion	7.536915
Sum squared resid	4289.090	Schwarz criterion	7.578710
Log likelihood	-153.5068	Hannan-Quinn criter.	7.552135
Durbin-Watson stat	1.650514		

Appendix 5 - ADF Unit Root Test at Level for M2

Null Hypothesis: M2 has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.930287	0.3156
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(M2)
Method: Least Squares
Date: 01/03/13 Time: 09:52
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2(-1)	-0.128201	0.066415	-1.930287	0.0609
C	15.70501	7.122009	2.205137	0.0334

R-squared	0.087207	Mean dependent var	2.589604
Adjusted R-squared	0.063802	S.D. dependent var	14.12740
S.E. of regression	13.66929	Akaike info criterion	8.115732
Sum squared resid	7287.135	Schwarz criterion	8.199321
Log likelihood	-164.3725	Hannan-Quinn criter.	8.146170
F-statistic	3.726007	Durbin-Watson stat	2.093397
Prob(F-statistic)	0.060866		

Null Hypothesis: M2 has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.081967	0.1240
Test critical values:	1% level	-4.198503	
	5% level	-3.523623	
	10% level	-3.192902	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(M2)
Method: Least Squares
Date: 01/03/13 Time: 09:54
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2(-1)	-0.384285	0.124688	-3.081967	0.0038
C	24.99483	7.784116	3.211004	0.0027
@TREND(1970)	0.805169	0.338725	2.377059	0.0226

R-squared	0.205365	Mean dependent var	2.589604
Adjusted R-squared	0.163542	S.D. dependent var	14.12740
S.E. of regression	12.92065	Akaike info criterion	8.025886
Sum squared resid	6343.838	Schwarz criterion	8.151269
Log likelihood	-161.5307	Hannan-Quinn criter.	8.071543
F-statistic	4.910356	Durbin-Watson stat	1.869295
Prob(F-statistic)	0.012682		

Null Hypothesis: M2 has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.552614	0.8314
Test critical values:	1% level	-2.622585	
	5% level	-1.949097	
	10% level	-1.611824	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(M2)
Method: Least Squares
Date: 01/03/13 Time: 09:55
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2(-1)	0.011520	0.020847	0.552614	0.5836

R-squared	-0.026603	Mean dependent var	2.589604
Adjusted R-squared	-0.026603	S.D. dependent var	14.12740
S.E. of regression	14.31408	Akaike info criterion	8.184452
Sum squared resid	8195.715	Schwarz criterion	8.226247
Log likelihood	-166.7813	Hannan-Quinn criter.	8.199672
Durbin-Watson stat	2.140460		

Appendix 6 - ADF Unit Root Test at Level for FDI

Null Hypothesis: FDI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.139395	0.2310
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI)
Method: Least Squares
Date: 01/03/13 Time: 09:56
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI(-1)	-0.265021	0.123877	-2.139395	0.0387
C	1.05E+09	4.81E+08	2.172223	0.0360

R-squared	0.105033	Mean dependent var	2.21E+08
Adjusted R-squared	0.082085	S.D. dependent var	1.93E+09
S.E. of regression	1.85E+09	Akaike info criterion	45.55886
Sum squared resid	1.33E+20	Schwarz criterion	45.64244
Log likelihood	-931.9565	Hannan-Quinn criter.	45.58929
F-statistic	4.577009	Durbin-Watson stat	2.179433
Prob(F-statistic)	0.038719		

Null Hypothesis: FDI has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.792721	0.0271
Test critical values:	1% level	-4.198503	
	5% level	-3.523623	
	10% level	-3.192902	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI)
Method: Least Squares
Date: 01/03/13 Time: 09:56
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI(-1)	-0.593166	0.156396	-3.792721	0.0005
C	1.11E+08	5.36E+08	0.207414	0.8368
@TREND(1970)	93095788	30774940	3.025052	0.0044

R-squared	0.278726	Mean dependent var	2.21E+08
Adjusted R-squared	0.240764	S.D. dependent var	1.93E+09
S.E. of regression	1.68E+09	Akaike info criterion	45.39187
Sum squared resid	1.07E+20	Schwarz criterion	45.51725
Log likelihood	-927.5333	Hannan-Quinn criter.	45.43753
F-statistic	7.342268	Durbin-Watson stat	1.931497
Prob(F-statistic)	0.002013		

Null Hypothesis: FDI has a unit root
Exogenous: None
Lag Length: 2 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.389597	0.7916
Test critical values:	1% level	-2.625606	
	5% level	-1.949609	
	10% level	-1.611593	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI)
Method: Least Squares
Date: 01/03/13 Time: 09:57
Sample (adjusted): 1973 2011
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI(-1)	0.031153	0.079963	0.389597	0.6991
D(FDI(-1))	-0.448446	0.177190	-2.530878	0.0159
D(FDI(-2))	-0.489262	0.201864	-2.423719	0.0205

R-squared	0.190014	Mean dependent var	2.31E+08
Adjusted R-squared	0.145015	S.D. dependent var	1.98E+09
S.E. of regression	1.83E+09	Akaike info criterion	45.56481
Sum squared resid	1.20E+20	Schwarz criterion	45.69278
Log likelihood	-885.5138	Hannan-Quinn criter.	45.61072
Durbin-Watson stat	1.961398		

Appendix 7 - ADF Unit Root Test at Level for Net Trade

Null Hypothesis: NT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.035655	0.9564
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NT)
Method: Least Squares
Date: 01/03/13 Time: 10:00
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NT(-1)	0.001794	0.050327	0.035655	0.9717
C	9.48E+08	8.60E+08	1.102838	0.2769

R-squared	0.000033	Mean dependent var	9.66E+08
Adjusted R-squared	-0.025608	S.D. dependent var	4.44E+09
S.E. of regression	4.49E+09	Akaike info criterion	47.33715
Sum squared resid	7.87E+20	Schwarz criterion	47.42074
Log likelihood	-968.4116	Hannan-Quinn criter.	47.36759
F-statistic	0.001271	Durbin-Watson stat	2.021297
Prob(F-statistic)	0.971739		

Null Hypothesis: NT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.514963	0.8081
Test critical values:	1% level	-4.198503	
	5% level	-3.523623	
	10% level	-3.192902	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NT)
Method: Least Squares
Date: 01/03/13 Time: 10:00
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NT(-1)	-0.116099	0.076635	-1.514963	0.1381
C	-1.66E+09	1.55E+09	-1.068976	0.2918
@TREND(1970)	1.80E+08	90310394	1.987591	0.0541

R-squared	0.094200	Mean dependent var	9.66E+08
Adjusted R-squared	0.046527	S.D. dependent var	4.44E+09
S.E. of regression	4.33E+09	Akaike info criterion	47.28702
Sum squared resid	7.13E+20	Schwarz criterion	47.41241
Log likelihood	-966.3840	Hannan-Quinn criter.	47.33268
F-statistic	1.975944	Durbin-Watson stat	1.984088
Prob(F-statistic)	0.152619		

Null Hypothesis: NT has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.821796	0.8854
Test critical values:	1% level	-2.622585	
	5% level	-1.949097	
	10% level	-1.611824	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NT)
Method: Least Squares
Date: 01/03/13 Time: 10:00
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NT(-1)	0.033853	0.041194	0.821796	0.4161

R-squared	-0.031152	Mean dependent var	9.66E+08
Adjusted R-squared	-0.031152	S.D. dependent var	4.44E+09
S.E. of regression	4.51E+09	Akaike info criterion	47.31908
Sum squared resid	8.12E+20	Schwarz criterion	47.36087
Log likelihood	-969.0411	Hannan-Quinn criter.	47.33430
Durbin-Watson stat	2.023916		

Appendix 8 - ADF Unit Root Test at First Difference for GDP

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.837976	0.0000
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 01/03/13 Time: 10:02
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-0.993152	0.170119	-5.837976	0.0000
C	5.63E+09	2.23E+09	2.523763	0.0159

R-squared	0.472822	Mean dependent var	7.51E+08
Adjusted R-squared	0.458949	S.D. dependent var	1.78E+10
S.E. of regression	1.31E+10	Akaike info criterion	49.47710
Sum squared resid	6.51E+21	Schwarz criterion	49.56155
Log likelihood	-987.5420	Hannan-Quinn criter.	49.50763
F-statistic	34.08196	Durbin-Watson stat	1.911411
Prob(F-statistic)	0.000001		

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.368995	0.0000
Test critical values:	1% level	-4.205004	
	5% level	-3.526609	
	10% level	-3.194611	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 01/03/13 Time: 10:03
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-1.077054	0.169109	-6.368995	0.0000
C	-1.60E+09	4.22E+09	-0.380726	0.7056
@TREND(1970)	3.56E+08	1.78E+08	1.996576	0.0533

R-squared	0.524095	Mean dependent var	7.51E+08
Adjusted R-squared	0.498371	S.D. dependent var	1.78E+10
S.E. of regression	1.26E+10	Akaike info criterion	49.42478
Sum squared resid	5.88E+21	Schwarz criterion	49.55145
Log likelihood	-985.4956	Hannan-Quinn criter.	49.47058
F-statistic	20.37334	Durbin-Watson stat	1.966352
Prob(F-statistic)	0.000001		

Null Hypothesis: D(GDP) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.947196	0.0000
Test critical values:	1% level	-2.624057	
	5% level	-1.949319	
	10% level	-1.611711	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 01/03/13 Time: 10:03
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-0.832299	0.168236	-4.947196	0.0000

R-squared	0.384459	Mean dependent var	7.51E+08
Adjusted R-squared	0.384459	S.D. dependent var	1.78E+10
S.E. of regression	1.40E+10	Akaike info criterion	49.58206
Sum squared resid	7.60E+21	Schwarz criterion	49.62429
Log likelihood	-990.6413	Hannan-Quinn criter.	49.59733
Durbin-Watson stat	1.920294		

Appendix 9 - ADF Unit Root Test at First Difference for Gini Index

Null Hypothesis: D(GINI) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.356386	0.0187
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GINI,2)
Method: Least Squares
Date: 01/03/13 Time: 10:04
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GINI(-1))	-0.449424	0.133901	-3.356386	0.0018
C	-0.000914	0.001007	-0.907213	0.3700

R-squared	0.228666	Mean dependent var	-0.000105
Adjusted R-squared	0.208368	S.D. dependent var	0.006953
S.E. of regression	0.006186	Akaike info criterion	-7.284266
Sum squared resid	0.001454	Schwarz criterion	-7.199822
Log likelihood	147.6853	Hannan-Quinn criter.	-7.253734
F-statistic	11.26533	Durbin-Watson stat	1.701469
Prob(F-statistic)	0.001803		

Null Hypothesis: D(GINI) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.323334	0.0771
Test critical values:	1% level	-4.205004	
	5% level	-3.526609	
	10% level	-3.194611	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GINI,2)
Method: Least Squares
Date: 01/03/13 Time: 10:04
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GINI(-1))	-0.450092	0.135434	-3.323334	0.0020
C	-0.001631	0.002108	-0.773390	0.4442
@TREND(1970)	3.33E-05	8.57E-05	0.388246	0.7001

R-squared	0.231796	Mean dependent var	-0.000105
Adjusted R-squared	0.190272	S.D. dependent var	0.006953
S.E. of regression	0.006257	Akaike info criterion	-7.238332
Sum squared resid	0.001448	Schwarz criterion	-7.111666
Log likelihood	147.7666	Hannan-Quinn criter.	-7.192533
F-statistic	5.582148	Durbin-Watson stat	1.707547
Prob(F-statistic)	0.007609		

Null Hypothesis: D(GINI) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.240596	0.0019
Test critical values:	1% level	-2.624057	
	5% level	-1.949319	
	10% level	-1.611711	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GINI,2)
Method: Least Squares
Date: 01/03/13 Time: 10:04
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GINI(-1))	-0.420360	0.129717	-3.240596	0.0024

R-squared	0.211960	Mean dependent var	-0.000105
Adjusted R-squared	0.211960	S.D. dependent var	0.006953
S.E. of regression	0.006172	Akaike info criterion	-7.312838
Sum squared resid	0.001486	Schwarz criterion	-7.270616
Log likelihood	147.2568	Hannan-Quinn criter.	-7.297572
Durbin-Watson stat	1.707692		

Appendix 10 - ADF Unit Root Test at First Difference for Domestic Credit Provided by Banking Sector

Null Hypothesis: D(BNKCDT) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.802287	0.0000
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BNKCDT,2)
Method: Least Squares
Date: 01/03/13 Time: 10:06
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BNKCDT(-1))	-0.939996	0.162004	-5.802287	0.0000
C	2.524576	2.468878	1.022560	0.3130

R-squared	0.469766	Mean dependent var	-0.070511
Adjusted R-squared	0.455813	S.D. dependent var	20.81659
S.E. of regression	15.35620	Akaike info criterion	8.349623
Sum squared resid	8960.891	Schwarz criterion	8.434066
Log likelihood	-164.9925	Hannan-Quinn criter.	8.380155
F-statistic	33.66653	Durbin-Watson stat	1.967215
Prob(F-statistic)	0.000001		

Null Hypothesis: D(BNKCDT) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.866520	0.0001
Test critical values:	1% level	-4.205004	
	5% level	-3.526609	
	10% level	-3.194611	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BNKCDT,2)
Method: Least Squares
Date: 01/03/13 Time: 10:06
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BNKCDT(-1))	-0.962944	0.164142	-5.866520	0.0000
C	6.858412	5.266735	1.302213	0.2009
@TREND(1970)	-0.198627	0.213115	-0.932018	0.3574

R-squared	0.481929	Mean dependent var	-0.070511
Adjusted R-squared	0.453925	S.D. dependent var	20.81659
S.E. of regression	15.38281	Akaike info criterion	8.376417
Sum squared resid	8755.339	Schwarz criterion	8.503083
Log likelihood	-164.5283	Hannan-Quinn criter.	8.422215
F-statistic	17.20941	Durbin-Watson stat	1.979889
Prob(F-statistic)	0.000005		

Null Hypothesis: D(BNKCDT) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.708207	0.0000
Test critical values:	1% level	-2.624057	
	5% level	-1.949319	
	10% level	-1.611711	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BNKCDT,2)
Method: Least Squares
Date: 01/03/13 Time: 10:07
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BNKCDT(-1))	-0.909986	0.159417	-5.708207	0.0000

R-squared	0.455176	Mean dependent var	-0.070511
Adjusted R-squared	0.455176	S.D. dependent var	20.81659
S.E. of regression	15.36518	Akaike info criterion	8.326767
Sum squared resid	9207.463	Schwarz criterion	8.368989
Log likelihood	-165.5353	Hannan-Quinn criter.	8.342033
Durbin-Watson stat	1.959119		

Appendix 11 - ADF Unit Root Test at First Difference for Domestic Credit to Private Sector

Null Hypothesis: D(PVTCDT) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.303385	0.0001
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(PVTCDT,2)
Method: Least Squares
Date: 01/03/13 Time: 10:10
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PVTCDT(-1))	-0.850874	0.160440	-5.303385	0.0000
C	2.011273	1.671030	1.203613	0.2362

R-squared	0.425339	Mean dependent var	-0.023311
Adjusted R-squared	0.410216	S.D. dependent var	13.39398
S.E. of regression	10.28623	Akaike info criterion	7.548195
Sum squared resid	4020.645	Schwarz criterion	7.632639
Log likelihood	-148.9639	Hannan-Quinn criter.	7.578727
F-statistic	28.12590	Durbin-Watson stat	1.959141
Prob(F-statistic)	0.000005		

Null Hypothesis: D(PVTCDT) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.379831	0.0004
Test critical values:	1% level	-4.205004	
	5% level	-3.526609	
	10% level	-3.194611	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(PVTCDT,2)
Method: Least Squares
Date: 01/03/13 Time: 10:10
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PVTCDT(-1))	-0.876709	0.162962	-5.379831	0.0000
C	4.985307	3.559901	1.400406	0.1697
@TREND(1970)	-0.135454	0.143109	-0.946507	0.3500

R-squared	0.438924	Mean dependent var	-0.023311
Adjusted R-squared	0.408595	S.D. dependent var	13.39398
S.E. of regression	10.30035	Akaike info criterion	7.574271
Sum squared resid	3925.595	Schwarz criterion	7.700937
Log likelihood	-148.4854	Hannan-Quinn criter.	7.620069
F-statistic	14.47235	Durbin-Watson stat	1.962226
Prob(F-statistic)	0.000023		

Null Hypothesis: D(PVTCDT) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.135561	0.0000
Test critical values:	1% level	-2.624057	
	5% level	-1.949319	
	10% level	-1.611711	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(PVTCDT,2)
Method: Least Squares
Date: 01/03/13 Time: 10:10
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PVTCDT(-1))	-0.806540	0.157050	-5.135561	0.0000

R-squared	0.403431	Mean dependent var	-0.023311
Adjusted R-squared	0.403431	S.D. dependent var	13.39398
S.E. of regression	10.34523	Akaike info criterion	7.535610
Sum squared resid	4173.925	Schwarz criterion	7.577832
Log likelihood	-149.7122	Hannan-Quinn criter.	7.550876
Durbin-Watson stat	1.964273		

Appendix 12 - ADF Unit Root Test at First Difference for M2

Null Hypothesis: D(M2) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.720773	0.0000
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(M2,2)
Method: Least Squares
Date: 01/03/13   Time: 10:11
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(M2(-1))	-1.086319	0.161636	-6.720773	0.0000
C	2.794721	2.320120	1.204559	0.2358

R-squared	0.543098	Mean dependent var	0.022599
Adjusted R-squared	0.531074	S.D. dependent var	21.08699
S.E. of regression	14.43998	Akaike info criterion	8.226585
Sum squared resid	7923.496	Schwarz criterion	8.311029
Log likelihood	-162.5317	Hannan-Quinn criter.	8.257118
F-statistic	45.16879	Durbin-Watson stat	2.046459
Prob(F-statistic)	0.000000		

Null Hypothesis: D(M2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.683263	0.0000
Test critical values:	1% level	-4.205004	
	5% level	-3.526609	
	10% level	-3.194611	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(M2,2)
Method: Least Squares
Date: 01/03/13 Time: 10:12
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(M2(-1))	-1.094574	0.163778	-6.683263	0.0000
C	5.230785	4.936936	1.059520	0.2962
@TREND(1970)	-0.112325	0.200411	-0.560475	0.5785

R-squared	0.546944	Mean dependent var	0.022599
Adjusted R-squared	0.522455	S.D. dependent var	21.08699
S.E. of regression	14.57209	Akaike info criterion	8.268131
Sum squared resid	7856.791	Schwarz criterion	8.394797
Log likelihood	-162.3626	Hannan-Quinn criter.	8.313930
F-statistic	22.33383	Durbin-Watson stat	2.051876
Prob(F-statistic)	0.000000		

Null Hypothesis: D(M2) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.574054	0.0000
Test critical values:	1% level	-2.624057	
	5% level	-1.949319	
	10% level	-1.611711	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(M2,2)
Method: Least Squares
Date: 01/03/13 Time: 10:12
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(M2(-1))	-1.051705	0.159978	-6.574054	0.0000

R-squared	0.525652	Mean dependent var	0.022599
Adjusted R-squared	0.525652	S.D. dependent var	21.08699
S.E. of regression	14.52323	Akaike info criterion	8.214058
Sum squared resid	8226.040	Schwarz criterion	8.256280
Log likelihood	-163.2812	Hannan-Quinn criter.	8.229324
Durbin-Watson stat	2.022252		

Appendix 13 - ADF Unit Root Test at First Difference for FDI

Null Hypothesis: D(FDI) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.451634	0.0000
Test critical values:	1% level	-3.610453	
	5% level	-2.938987	
	10% level	-2.607932	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI,2)
Method: Least Squares
Date: 01/03/13 Time: 10:12
Sample (adjusted): 1973 2011
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI(-1))	-1.931905	0.299444	-6.451634	0.0000
D(FDI(-1),2)	0.488794	0.195943	2.494573	0.0173
C	3.32E+08	2.90E+08	1.143354	0.2604

R-squared	0.692879	Mean dependent var	29692749
Adjusted R-squared	0.675817	S.D. dependent var	3.16E+09
S.E. of regression	1.80E+09	Akaike info criterion	45.53335
Sum squared resid	1.17E+20	Schwarz criterion	45.66131
Log likelihood	-884.9003	Hannan-Quinn criter.	45.57926
F-statistic	40.60891	Durbin-Watson stat	1.973048
Prob(F-statistic)	0.000000		

Null Hypothesis: D(FDI) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.333064	0.0000
Test critical values:	1% level	-4.211868	
	5% level	-3.529758	
	10% level	-3.196411	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI,2)
Method: Least Squares
Date: 01/03/13 Time: 10:13
Sample (adjusted): 1973 2011
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI(-1))	-1.925309	0.304009	-6.333064	0.0000
D(FDI(-1),2)	0.481921	0.199668	2.413608	0.0212
C	1.53E+08	6.46E+08	0.236244	0.8146
@TREND(1970)	8143061.	26128965	0.311649	0.7572

R-squared	0.693729	Mean dependent var	29692749
Adjusted R-squared	0.667478	S.D. dependent var	3.16E+09
S.E. of regression	1.82E+09	Akaike info criterion	45.58186
Sum squared resid	1.16E+20	Schwarz criterion	45.75248
Log likelihood	-884.8462	Hannan-Quinn criter.	45.64308
F-statistic	26.42600	Durbin-Watson stat	1.976168
Prob(F-statistic)	0.000000		

Null Hypothesis: D(FDI) has a unit root
Exogenous: None
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.341468	0.0000
Test critical values:	1% level	-2.625606	
	5% level	-1.949609	
	10% level	-1.611593	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI,2)
Method: Least Squares
Date: 01/03/13 Time: 10:13
Sample (adjusted): 1973 2011
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI(-1))	-1.896646	0.299086	-6.341468	0.0000
D(FDI(-1),2)	0.475375	0.196401	2.420424	0.0205

R-squared	0.681727	Mean dependent var	29692749
Adjusted R-squared	0.673125	S.D. dependent var	3.16E+09
S.E. of regression	1.81E+09	Akaike info criterion	45.51773
Sum squared resid	1.21E+20	Schwarz criterion	45.60305
Log likelihood	-885.5958	Hannan-Quinn criter.	45.54834
Durbin-Watson stat	1.946545		

Appendix 14 - ADF Unit Root Test at First Difference for Net Trade

Null Hypothesis: D(NT) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.222009	0.0000
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NT,2)
Method: Least Squares
Date: 01/03/13 Time: 10:14
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NT(-1))	-1.010430	0.162396	-6.222009	0.0000
C	9.60E+08	7.35E+08	1.306187	0.1993

R-squared	0.504650	Mean dependent var	21110435
Adjusted R-squared	0.491614	S.D. dependent var	6.38E+09
S.E. of regression	4.55E+09	Akaike info criterion	47.36373
Sum squared resid	7.87E+20	Schwarz criterion	47.44817
Log likelihood	-945.2746	Hannan-Quinn criter.	47.39426
F-statistic	38.71339	Durbin-Watson stat	1.997753
Prob(F-statistic)	0.000000		

Null Hypothesis: D(NT) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.435815	0.0000
Test critical values:	1% level	-4.205004	
	5% level	-3.526609	
	10% level	-3.194611	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NT,2)
Method: Least Squares
Date: 01/03/13 Time: 10:14
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NT(-1))	-1.053203	0.163647	-6.435815	0.0000
C	-8.38E+08	1.51E+09	-0.555966	0.5816
@TREND(1970)	85514255	62814266	1.361383	0.1816

R-squared	0.528279	Mean dependent var	21110435
Adjusted R-squared	0.502780	S.D. dependent var	6.38E+09
S.E. of regression	4.50E+09	Akaike info criterion	47.36485
Sum squared resid	7.49E+20	Schwarz criterion	47.49152
Log likelihood	-944.2970	Hannan-Quinn criter.	47.41065
F-statistic	20.71807	Durbin-Watson stat	2.012330
Prob(F-statistic)	0.000001		

Null Hypothesis: D(NT) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.029095	0.0000
Test critical values:	1% level	-2.624057	
	5% level	-1.949319	
	10% level	-1.611711	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NT,2)
Method: Least Squares
Date: 01/03/13 Time: 10:14
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NT(-1))	-0.966879	0.160369	-6.029095	0.0000

R-squared	0.482409	Mean dependent var	21110435
Adjusted R-squared	0.482409	S.D. dependent var	6.38E+09
S.E. of regression	4.59E+09	Akaike info criterion	47.35765
Sum squared resid	8.22E+20	Schwarz criterion	47.39987
Log likelihood	-946.1530	Hannan-Quinn criter.	47.37291
Durbin-Watson stat	1.998704		

Appendix 15 - Ordinary Least Squares Estimation for Model 1

Dependent Variable: LOG(GDP)
Method: Least Squares
Date: 01/03/13 Time: 10:16
Sample: 1970 2011
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.24060	0.698180	23.26136	0.0000
LOG(GINI)	-0.572319	0.744023	-0.769221	0.4466
LOG(BNKCDT)	0.447377	0.089032	5.024884	0.0000
LOG(FDI)	0.281904	0.038934	7.240565	0.0000
NT	1.87E-11	2.19E-12	8.525467	0.0000

R-squared	0.940899	Mean dependent var	24.96305
Adjusted R-squared	0.934509	S.D. dependent var	0.675844
S.E. of regression	0.172956	Akaike info criterion	-0.560211
Sum squared resid	1.106815	Schwarz criterion	-0.353345
Log likelihood	16.76443	Hannan-Quinn criter.	-0.484386
F-statistic	147.2607	Durbin-Watson stat	1.368780
Prob(F-statistic)	0.000000		

Appendix 16 - Ordinary Least Squares Estimation for Model 2

Dependent Variable: LOG(GDP)
Method: Least Squares
Date: 01/03/13 Time: 10:17
Sample: 1970 2011
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.55379	0.752941	23.31364	0.0000
LOG(GINI)	0.830356	0.874714	0.949289	0.3486
LOG(PVTCDT)	0.556771	0.099462	5.597822	0.0000
LOG(FDI)	0.251841	0.038606	6.523404	0.0000
NT	1.91E-11	2.10E-12	9.099925	0.0000

R-squared	0.946162	Mean dependent var	24.96305
Adjusted R-squared	0.940342	S.D. dependent var	0.675844
S.E. of regression	0.165075	Akaike info criterion	-0.653492
Sum squared resid	1.008239	Schwarz criterion	-0.446626
Log likelihood	18.72333	Hannan-Quinn criter.	-0.577668
F-statistic	162.5628	Durbin-Watson stat	1.241455
Prob(F-statistic)	0.000000		

Appendix 17 - Ordinary Least Squares Estimation for Model 3

Dependent Variable: LOG(GDP)
Method: Least Squares
Date: 12/20/12 Time: 20:50
Sample: 1970 2011
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	14.93942	0.683245	21.86539	0.0000
LOG(GINI)	-0.891479	0.702381	-1.269224	0.2123
LOG(M2)	0.603172	0.119853	5.032603	0.0000
LOG(FDI)	0.298601	0.038250	7.806517	0.0000
NT	1.57E-11	2.22E-12	7.044105	0.0000

R-squared	0.940972	Mean dependent var	24.96305
Adjusted R-squared	0.934591	S.D. dependent var	0.675844
S.E. of regression	0.172849	Akaike info criterion	-0.561457
Sum squared resid	1.105436	Schwarz criterion	-0.354592
Log likelihood	16.79060	Hannan-Quinn criter.	-0.485633
F-statistic	147.4559	Durbin-Watson stat	1.505645
Prob(F-statistic)	0.000000		

Appendix 18 - ADF Unit Root Test for Model 3 Residuals

Null Hypothesis: UHAT3 has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.853376	0.0003
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UHAT3)
Method: Least Squares
Date: 01/03/13 Time: 10:26
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UHAT3(-1)	-0.754455	0.155449	-4.853376	0.0000
C	0.001353	0.025474	0.053112	0.9579

R-squared	0.376551	Mean dependent var	0.002579
Adjusted R-squared	0.360565	S.D. dependent var	0.203968
S.E. of regression	0.163102	Akaike info criterion	-0.741325
Sum squared resid	1.037495	Schwarz criterion	-0.657736
Log likelihood	17.19717	Hannan-Quinn criter.	-0.710887
F-statistic	23.55526	Durbin-Watson stat	1.862270
Prob(F-statistic)	0.000020		

Null Hypothesis: UHAT3 has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.874360	0.0016
Test critical values:	1% level	-4.198503	
	5% level	-3.523623	
	10% level	-3.192902	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UHAT3)
Method: Least Squares
Date: 01/03/13 Time: 10:27
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UHAT3(-1)	-0.769760	0.157920	-4.874360	0.0000
C	-0.031315	0.052629	-0.595009	0.5554
@TREND(1970)	0.001554	0.002187	0.710744	0.4816

R-squared	0.384730	Mean dependent var	0.002579
Adjusted R-squared	0.352348	S.D. dependent var	0.203968
S.E. of regression	0.164147	Akaike info criterion	-0.705751
Sum squared resid	1.023883	Schwarz criterion	-0.580368
Log likelihood	17.46789	Hannan-Quinn criter.	-0.660093
F-statistic	11.88077	Durbin-Watson stat	1.864363
Prob(F-statistic)	0.000098		

Null Hypothesis: UHAT3 has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.915803	0.0000
Test critical values:	1% level	-2.622585	
	5% level	-1.949097	
	10% level	-1.611824	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UHAT3)
Method: Least Squares
Date: 01/03/13 Time: 10:27
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UHAT3(-1)	-0.754537	0.153492	-4.915803	0.0000

R-squared	0.376506	Mean dependent var	0.002579
Adjusted R-squared	0.376506	S.D. dependent var	0.203968
S.E. of regression	0.161057	Akaike info criterion	-0.790033
Sum squared resid	1.037570	Schwarz criterion	-0.748239
Log likelihood	17.19569	Hannan-Quinn criter.	-0.774814
Durbin-Watson stat	1.862016		

Appendix 19 - Johansen Cointegration Test

Date: 01/03/13 Time: 10:29
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments
Trend assumption: Linear deterministic trend
Series: GDP GINI M2 FDI NT
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.511815	73.05544	69.81889	0.0269
At most 1	0.388621	44.37300	47.85613	0.1024
At most 2	0.268039	24.69148	29.79707	0.1728
At most 3	0.196792	12.21039	15.49471	0.1471
At most 4	0.082514	3.444718	3.841466	0.0634

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.511815	28.68244	33.87687	0.1838
At most 1	0.388621	19.68152	27.58434	0.3636
At most 2	0.268039	12.48110	21.13162	0.5009
At most 3	0.196792	8.765667	14.26460	0.3062
At most 4	0.082514	3.444718	3.841466	0.0634

Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

GDP	GINI	M2	FDI	NT
-6.05E-11	54.81141	0.071737	1.03E-09	1.01E-10
-5.56E-11	-32.17624	-0.023926	5.06E-10	1.50E-10
2.52E-11	1.749146	-0.009914	3.17E-11	8.26E-12
-8.84E-12	-11.19105	0.027959	-5.00E-10	2.78E-11
3.99E-12	28.04126	-0.005682	-1.12E-10	5.62E-11

Unrestricted Adjustment Coefficients (alpha):

D(GDP)	2.91E+08	2.58E+09	4.94E+09	1.90E+09	1.38E+09
D(GINI)	-0.001439	0.002608	0.000254	0.000382	-0.000978
D(M2)	-3.682199	0.130934	-0.107392	-5.275191	1.255814
D(FDI)	-5.75E+08	23909895	4.94E+08	3.79E+08	1.82E+08
D(NT)	8.71E+08	-1.39E+09	1.30E+09	-4.62E+08	-5.61E+08

1 Cointegrating Equation(s): Log likelihood -2810.214

Normalized cointegrating coefficients (standard error in parentheses)

GDP	GINI	M2	FDI	NT
1.000000	-9.06E+11	-1.19E+09	-17.03540	-1.676541
	(1.9E+11)	(2.0E+08)	(2.17589)	(0.27384)

Adjustment coefficients (standard error in parentheses)

D(GDP)	-0.017595
	(0.12885)
D(GINI)	8.71E-14
	(6.0E-14)
D(M2)	2.23E-10
	(1.4E-10)
D(FDI)	0.034765
	(0.01616)
D(NT)	-0.052713
	(0.04328)

2 Cointegrating Equation(s): Log likelihood -2800.374

Normalized cointegrating coefficients (standard error in parentheses)

GDP	GINI	M2	FDI	NT
1.000000	0.000000	-2.00E+08	-12.19783	-2.300786
		(1.2E+08)	(1.73321)	(0.25635)
0.000000	1.000000	0.001088	5.34E-12	-6.89E-13
		(0.00015)	(2.1E-12)	(3.2E-13)

Adjustment coefficients (standard error in parentheses)

D(GDP)	-0.160828	-6.70E+10
	(0.17102)	(1.3E+11)
D(GINI)	-5.78E-14	-0.162824
	(7.2E-14)	(0.05560)
D(M2)	2.15E-10	-206.0395
	(1.9E-10)	(145.743)
D(FDI)	0.033437	-3.23E+10
	(0.02194)	(1.7E+10)
D(NT)	0.024264	9.23E+10
	(0.05533)	(4.3E+10)

3 Cointegrating Equation(s):	Log likelihood	-2794.133		
Normalized cointegrating coefficients (standard error in parentheses)				
GDP	GINI	M2	FDI	NT
1.000000	0.000000	0.000000	-21.90379	-4.285898
			(5.69696)	(0.80561)
0.000000	1.000000	0.000000	5.82E-11	1.01E-11
			(2.8E-11)	(3.9E-12)
0.000000	0.000000	1.000000	-4.86E-08	-9.94E-09
			(2.6E-08)	(3.6E-09)
Adjustment coefficients (standard error in parentheses)				
D(GDP)	-0.036265	-5.84E+10	-89823460	
	(0.16290)	(1.2E+11)	(1.4E+08)	
D(GINI)	-5.14E-14	-0.162380	-0.000168	
	(7.5E-14)	(0.05555)	(6.7E-05)	
D(M2)	2.13E-10	-206.2273	-0.266217	
	(2.0E-10)	(145.794)	(0.17488)	
D(FDI)	0.045879	-3.14E+10	-46694766	
	(0.02173)	(1.6E+10)	(1.9E+07)	
D(NT)	0.057087	9.46E+10	82748816	
	(0.05449)	(4.0E+10)	(4.8E+07)	

4 Cointegrating Equation(s):	Log likelihood	-2789.750		
Normalized cointegrating coefficients (standard error in parentheses)				
GDP	GINI	M2	FDI	NT
1.000000	0.000000	0.000000	0.000000	2.053691
				(1.54448)
0.000000	1.000000	0.000000	0.000000	-6.73E-12
				(2.4E-12)
0.000000	0.000000	1.000000	0.000000	4.13E-09
				(1.7E-09)
0.000000	0.000000	0.000000	1.000000	0.289429
				(0.10217)
Adjustment coefficients (standard error in parentheses)				
D(GDP)	-0.053066	-7.96E+10	-36694281	0.810900
	(0.16125)	(1.2E+11)	(1.5E+08)	(2.33849)
D(GINI)	-5.48E-14	-0.166659	-0.000157	-3.47E-13
	(7.5E-14)	(0.05624)	(7.1E-05)	(1.1E-12)
D(M2)	2.59E-10	-147.1924	-0.413708	-1.09E-09
	(1.8E-10)	(135.645)	(0.17068)	(2.6E-09)
D(FDI)	0.042531	-3.56E+10	-36105941	-0.753802
	(0.02109)	(1.6E+10)	(2.0E+07)	(0.30587)
D(NT)	0.061169	9.98E+10	69841035	0.469177
	(0.05434)	(4.1E+10)	(5.1E+07)	(0.78807)

Appendix 20 - Engle-Granger Cointegration Test for GDP and GINI

Date: 01/03/13 Time: 10:35
Series: LOG(GDP) LOG(GINI)
Sample: 1970 2011
Included observations: 42
Null hypothesis: Series are not cointegrated
Cointegrating equation deterministics: C
Automatic lags specification based on Schwarz criterion (maxlag=9)

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
LOG(GDP)	-2.235665	0.4169	-11.08705	0.2525
LOG(GINI)	-2.398343	0.3409	-12.53071	0.1846

*MacKinnon (1996) p-values.

Intermediate Results:

	LOG(GDP)	LOG(GINI)
Rho - 1	-0.153122	-0.150957
Rho S.E.	0.068490	0.062942
Residual variance	0.024775	0.000248
Long-run residual variance	0.081181	0.001070
Number of lags	1	1
Number of observations	40	40
Number of stochastic trends**	2	2

**Number of stochastic trends in asymptotic distribution

Appendix 21 - Engle-Granger Cointegration Test for GDP and M2

Date: 01/03/13 Time: 10:36
Series: LOG(GDP) LOG(M2)
Sample: 1970 2011
Included observations: 42
Null hypothesis: Series are not cointegrated
Cointegrating equation deterministics: C
Automatic lags specification based on Schwarz criterion (maxlag=9)

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
LOG(GDP)	-2.074078	0.4967	-9.529951	0.3469
LOG(M2)	-2.915719	0.1537	-13.76006	0.1403

*MacKinnon (1996) p-values.

Intermediate Results:

	LOG(GDP)	LOG(M2)
Rho - 1	-0.232438	-0.335611
Rho S.E.	0.112068	0.115104
Residual variance	0.064590	0.023606
Long-run residual variance	0.064590	0.023606
Number of lags	0	0
Number of observations	41	41
Number of stochastic trends**	2	2

**Number of stochastic trends in asymptotic distribution

Appendix 22 - Engle-Granger Cointegration Test for GDP and FDI

Date: 01/03/13 Time: 10:37
Series: LOG(GDP) LOG(FDI)
Sample: 1970 2011
Included observations: 42
Null hypothesis: Series are not cointegrated
Cointegrating equation deterministics: C
Automatic lags specification based on Schwarz criterion (maxlag=9)

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
LOG(GDP)	-3.065554	0.1172	-15.81246	0.0853
LOG(FDI)	-4.305938	0.0072	-25.86227	0.0046

*MacKinnon (1996) p-values.

Intermediate Results:

	LOG(GDP)	LOG(FDI)
Rho - 1	-0.385670	-0.630787
Rho S.E.	0.125808	0.146492
Residual variance	0.102242	0.267885
Long-run residual variance	0.102242	0.267885
Number of lags	0	0
Number of observations	41	41
Number of stochastic trends**	2	2

**Number of stochastic trends in asymptotic distribution

Appendix 23 - Engle-Granger Cointegration Test for GDP and NT

Date: 01/03/13 Time: 10:38
Series: LOG(GDP) NT
Sample: 1970 2011
Included observations: 42
Null hypothesis: Series are not cointegrated
Cointegrating equation deterministics: C
Automatic lags specification based on Schwarz criterion (maxlag=9)

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
LOG(GDP)	-2.408283	0.3361	-6.365429	0.5963
NT	-1.728396	0.6668	-5.396463	0.6824

*MacKinnon (1996) p-values.

Intermediate Results:

	LOG(GDP)	NT
Rho - 1	-0.155254	-0.131621
Rho S.E.	0.064467	0.076152
Residual variance	0.035523	2.31E+19
Long-run residual variance	0.035523	2.31E+19
Number of lags	0	0
Number of observations	41	41
Number of stochastic trends**	2	2

**Number of stochastic trends in asymptotic distribution

Appendix 24 - Engle-Granger Cointegration Test for GINI and M2

Date: 01/03/13 Time: 10:41
Series: LOG(GINI) LOG(M2)
Sample: 1970 2011
Included observations: 42
Null hypothesis: Series are not cointegrated
Cointegrating equation deterministics: C
Automatic lags specification based on Schwarz criterion (maxlag=9)

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
LOG(GINI)	-2.306611	0.3827	-8.608679	0.4119
LOG(M2)	-3.348507	0.0673	-13.35003	0.1543

*MacKinnon (1996) p-values.

Intermediate Results:

	LOG(GINI)	LOG(M2)
Rho - 1	-0.209968	-0.325611
Rho S.E.	0.091029	0.097241
Residual variance	0.000588	0.020969
Long-run residual variance	0.000588	0.020969
Number of lags	0	0
Number of observations	41	41
Number of stochastic trends**	2	2

**Number of stochastic trends in asymptotic distribution

Appendix 25 - Engle-Granger Cointegration Test for GINI and FDI

Date: 01/03/13 Time: 10:42
Series: LOG(GINI) LOG(FDI)
Sample: 1970 2011
Included observations: 42
Null hypothesis: Series are not cointegrated
Cointegrating equation deterministics: C
Automatic lags specification based on Schwarz criterion (maxlag=9)

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
LOG(GINI)	-2.196601	0.4357	-8.827421	0.3958
LOG(FDI)	-3.656542	0.0346	-19.97464	0.0280

*MacKinnon (1996) p-values.

Intermediate Results:

	LOG(GINI)	LOG(FDI)
Rho - 1	-0.215303	-0.487186
Rho S.E.	0.098016	0.133237
Residual variance	0.001123	0.362736
Long-run residual variance	0.001123	0.362736
Number of lags	0	0
Number of observations	41	41
Number of stochastic trends**	2	2

**Number of stochastic trends in asymptotic distribution

Appendix 26 - Engle-Granger Cointegration Test for GINI and NT

Date: 01/03/13 Time: 10:43
Series: LOG(GINI) NT
Sample: 1970 2011
Included observations: 42
Null hypothesis: Series are not cointegrated
Cointegrating equation deterministics: C
Automatic lags specification based on Schwarz criterion (maxlag=9)

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
LOG(GINI)	-1.158154	0.8694	-2.107906	0.9269
NT	-0.499791	0.9634	-1.200148	0.9626

*MacKinnon (1996) p-values.

Intermediate Results:

	LOG(GINI)	NT
Rho - 1	-0.051412	-0.029272
Rho S.E.	0.044392	0.058568
Residual variance	0.000274	2.01E+19
Long-run residual variance	0.000274	2.01E+19
Number of lags	0	0
Number of observations	41	41
Number of stochastic trends**	2	2

**Number of stochastic trends in asymptotic distribution

Appendix 27 - Engle-Granger Cointegration Test for M2 and FDI

Date: 01/03/13 Time: 10:44
Series: LOG(M2) LOG(FDI)
Sample: 1970 2011
Included observations: 42
Null hypothesis: Series are not cointegrated
Cointegrating equation deterministics: C
Automatic lags specification based on Schwarz criterion (maxlag=9)

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
LOG(M2)	-2.985176	0.1359	-13.31668	0.1555
LOG(FDI)	-3.498821	0.0490	-19.74550	0.0299

*MacKinnon (1996) p-values.

Intermediate Results:

	LOG(M2)	LOG(FDI)
Rho - 1	-0.324797	-0.481598
Rho S.E.	0.108803	0.137646
Residual variance	0.047469	0.424831
Long-run residual variance	0.047469	0.424831
Number of lags	0	0
Number of observations	41	41
Number of stochastic trends**	2	2

**Number of stochastic trends in asymptotic distribution

Appendix 28 - Engle-Granger Cointegration Test for M2 and NT

Date: 01/03/13 Time: 10:45
Series: LOG(M2) NT
Sample: 1970 2011
Included observations: 42
Null hypothesis: Series are not cointegrated
Cointegrating equation deterministics: C
Automatic lags specification based on Schwarz criterion (maxlag=9)

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
LOG(M2)	-2.831070	0.1778	-8.517560	0.4187
NT	-1.018717	0.8989	-3.000559	0.8758

*MacKinnon (1996) p-values.

Intermediate Results:

	LOG(M2)	NT
Rho - 1	-0.207745	-0.073184
Rho S.E.	0.073381	0.071840
Residual variance	0.023556	3.04E+19
Long-run residual variance	0.023556	3.04E+19
Number of lags	0	0
Number of observations	41	41
Number of stochastic trends**	2	2

**Number of stochastic trends in asymptotic distribution

Appendix 29 - Engle-Granger Cointegration Test for FDI and NT

Date: 01/03/13 Time: 10:45
Series: LOG(FDI) NT
Sample: 1970 2011
Included observations: 42
Null hypothesis: Series are not cointegrated
Cointegrating equation deterministics: C
Automatic lags specification based on Schwarz criterion (maxlag=9)

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
LOG(FDI)	-3.171125	0.0959	-15.03068	0.1035
NT	-1.133585	0.8751	-3.477780	0.8425

*MacKinnon (1996) p-values.

Intermediate Results:

	LOG(FDI)	NT
Rho - 1	-0.366602	-0.084824
Rho S.E.	0.115606	0.074828
Residual variance	0.390344	3.95E+19
Long-run residual variance	0.390344	3.95E+19
Number of lags	0	0
Number of observations	41	41
Number of stochastic trends**	2	2

**Number of stochastic trends in asymptotic distribution

Appendix 30 - ECM for Model 3

Dependent Variable: D(LOG(GDP))
Method: Least Squares
Date: 12/20/12 Time: 20:51
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.056686	0.017137	3.307788	0.0022
D(LOG(GINI))	0.805128	1.088793	0.739468	0.4646
D(LOG(M2))	0.041177	0.117386	0.350783	0.7279
D(LOG(FDI))	0.111418	0.026287	4.238582	0.0002
D(NT)	-6.44E-15	3.67E-12	-0.001756	0.9986
UHAT3(-1)	-0.267644	0.113209	-2.364149	0.0238

R-squared	0.375870	Mean dependent var	0.064193
Adjusted R-squared	0.286709	S.D. dependent var	0.117141
S.E. of regression	0.098933	Akaike info criterion	-1.654288
Sum squared resid	0.342571	Schwarz criterion	-1.403522
Log likelihood	39.91291	Hannan-Quinn criter.	-1.562973
F-statistic	4.215621	Durbin-Watson stat	1.515547
Prob(F-statistic)	0.004194		

Appendix 31 - VIF for Base Model

Variance Inflation Factors
Date: 01/03/13 Time: 10:49
Sample: 1970 2011
Included observations: 42

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.466824	656.2514	NA
LOG(GINI)	0.493339	389.7516	3.223903
LOG(M2)	0.014365	425.4310	2.928463
LOG(FDI)	0.001463	956.4122	1.724421
NT	4.94E-24	2.248976	1.469353

Appendix 32 - VIF for ECM

Variance Inflation Factors
Date: 01/03/13 Time: 10:50
Sample: 1970 2011
Included observations: 41

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.000294	1.230186	NA
D(LOG(GINI))	1.185471	1.099805	1.032242
D(LOG(M2))	0.013779	1.334665	1.271718
D(LOG(FDI))	0.000691	1.327032	1.309432
D(NT)	1.35E-23	1.134816	1.082260
UHAT3(-1)	0.012816	1.441672	1.441530

Appendix 33 - Scaled Coefficients for Base Model

Scaled Coefficients
Date: 01/03/13 Time: 10:51
Sample: 1970 2011
Included observations: 42

Variable	Coefficient	Standardized Coefficient	Elasticity at Means
C	14.93942	NA	0.598461
LOG(GINI)	-0.891479	-0.091024	0.026661
LOG(M2)	0.603172	0.343985	0.110523
LOG(FDI)	0.298601	0.409455	0.257710
NT	1.57E-11	0.341049	0.006645

Appendix 34 - Scaled Coefficients for ECM

Scaled Coefficients
Date: 01/03/13 Time: 10:52
Sample: 1970 2011
Included observations: 41

Variable	Coefficient	Standardized Coefficient	Elasticity at Means
C	0.056686	NA	0.883053
D(LOG(GINI))	0.805128	0.100326	-0.046263
D(LOG(M2))	0.041177	0.052825	0.021183
D(LOG(FDI))	0.111418	0.647687	0.135347
D(NT)	-6.44E-15	-0.000244	-9.69E-05
UHAT3(-1)	-0.267644	-0.379044	0.006777

Appendix 35 - Ramsey RESET Test for Base Model

Ramsey RESET Test
Equation: MODEL3
Specification: LOG(GDP) C LOG(GINI) LOG(M2) LOG(FDI) NT
Instrument specification: LOG(M2) LOG(FDI) BOP
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.370075	36	0.1791
F-statistic	1.877105	(1, 36)	0.1791
Likelihood ratio	2.134771	1	0.1440

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.054783	1	0.054783
Restricted SSR	1.105436	37	0.029877
Unrestricted SSR	1.050653	36	0.029185
Unrestricted SSR	1.050653	36	0.029185

LR test summary:

	Value	df
Restricted LogL	16.79060	37
Unrestricted LogL	17.85799	36

Unrestricted Test Equation:
Dependent Variable: LOG(GDP)
Method: Least Squares
Date: 01/03/13 Time: 10:56
Sample: 1970 2011
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	33.61211	13.64568	2.463205	0.0187
LOG(GINI)	-7.403646	4.803574	-1.541278	0.1320
LOG(M2)	4.828989	3.086643	1.564479	0.1265
LOG(FDI)	2.475491	1.589333	1.557565	0.1281
NT	1.34E-10	8.65E-11	1.550632	0.1297
FITTED^2	-0.145964	0.106537	-1.370075	0.1791

R-squared	0.943898	Mean dependent var	24.96305
Adjusted R-squared	0.936106	S.D. dependent var	0.675844
S.E. of regression	0.170836	Akaike info criterion	-0.564666
Sum squared resid	1.050653	Schwarz criterion	-0.316428
Log likelihood	17.85799	Hannan-Quinn criter.	-0.473677
F-statistic	121.1366	Durbin-Watson stat	1.338878
Prob(F-statistic)	0.000000		

Ramsey RESET Test
Equation: MODEL3
Specification: LOG(GDP) C LOG(GINI) LOG(M2) LOG(FDI) NT
Instrument specification: LOG(M2) LOG(FDI) BOP
Omitted Variables: Powers of fitted values from 2 to 3

	Value	df	Probability
F-statistic	0.920811	(2, 35)	0.4076
Likelihood ratio	2.153766	2	0.3407

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.055258	2	0.027629
Restricted SSR	1.105436	37	0.029877
Unrestricted SSR	1.050178	35	0.030005
Unrestricted SSR	1.050178	35	0.030005

LR test summary:

	Value	df
Restricted LogL	16.79060	37
Unrestricted LogL	17.86748	35

Unrestricted Test Equation:
Dependent Variable: LOG(GDP)
Method: Least Squares
Date: 01/03/13 Time: 10:58
Sample: 1970 2011
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	173.6792	1113.248	0.156011	0.8769
LOG(GINI)	-26.18730	149.3598	-0.175330	0.8618
LOG(M2)	17.50790	100.8124	0.173668	0.8631
LOG(FDI)	8.752014	49.90777	0.175364	0.8618
NT	4.63E-10	2.62E-09	0.177017	0.8605
FITTED^2	-0.992158	6.725873	-0.147514	0.8836
FITTED^3	0.011347	0.090179	0.125828	0.9006

R-squared	0.943923	Mean dependent var	24.96305
Adjusted R-squared	0.934310	S.D. dependent var	0.675844
S.E. of regression	0.173220	Akaike info criterion	-0.517499
Sum squared resid	1.050178	Schwarz criterion	-0.227888
Log likelihood	17.86748	Hannan-Quinn criter.	-0.411345
F-statistic	98.19008	Durbin-Watson stat	1.332025
Prob(F-statistic)	0.000000		

Appendix 36 - Ramsey RESET Test for ECM

Ramsey RESET Test
Equation: MODEL3_ECM
Specification: D(LOG(GDP)) C D(LOG(GINI)) D(LOG(M2)) D(LOG(FDI)) D(NT) UHAT3(-1)
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.860470	34	0.0715
F-statistic	3.461349	(1, 34)	0.0715
Likelihood ratio	3.974916	1	0.0462

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.031653	1	0.031653
Restricted SSR	0.342571	35	0.009788
Unrestricted SSR	0.310918	34	0.009145
Unrestricted SSR	0.310918	34	0.009145

LR test summary:

	Value	df
Restricted LogL	39.91291	35
Unrestricted LogL	41.90037	34

Unrestricted Test Equation:
Dependent Variable: D(LOG(GDP))
Method: Least Squares
Date: 01/03/13 Time: 10:57
Sample: 1971 2011
Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.095959	0.026832	3.576218	0.0011
D(LOG(GINI))	1.429827	1.104683	1.294332	0.2043
D(LOG(M2))	0.006267	0.115005	0.054491	0.9569
D(LOG(FDI))	0.138991	0.029415	4.725207	0.0000
D(NT)	-8.85E-13	3.58E-12	-0.247535	0.8060
UHAT3(-1)	-0.335593	0.115361	-2.909067	0.0063
FITTED^2	-4.067449	2.186248	-1.860470	0.0715

R-squared	0.433539	Mean dependent var	0.064193
Adjusted R-squared	0.333575	S.D. dependent var	0.117141
S.E. of regression	0.095628	Akaike info criterion	-1.702457
Sum squared resid	0.310918	Schwarz criterion	-1.409896
Log likelihood	41.90037	Hannan-Quinn criter.	-1.595923
F-statistic	4.336959	Durbin-Watson stat	1.550930
Prob(F-statistic)	0.002364		

Ramsey RESET Test
Equation: MODEL3_ECM
Specification: D(LOG(GDP)) C D(LOG(GINI)) D(LOG(M2)) D(LOG(FDI)) D(NT) UHAT3(-1)
Omitted Variables: Powers of fitted values from 2 to 3

	Value	df	Probability
F-statistic	1.779517	(2, 33)	0.1845
Likelihood ratio	4.199251	2	0.1225

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.033349	2	0.016675
Restricted SSR	0.342571	35	0.009788
Unrestricted SSR	0.309222	33	0.009370
Unrestricted SSR	0.309222	33	0.009370

LR test summary:

	Value	df
Restricted LogL	39.91291	35
Unrestricted LogL	42.01254	33

Unrestricted Test Equation:
Dependent Variable: D(LOG(GDP))
Method: Least Squares
Date: 01/03/13 Time: 10:57
Sample: 1971 2011
Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.096531	0.027195	3.549611	0.0012
D(LOG(GINI))	1.481113	1.124710	1.316885	0.1969
D(LOG(M2))	0.000336	0.117247	0.002869	0.9977
D(LOG(FDI))	0.162397	0.062549	2.596325	0.0140
D(NT)	-1.10E-12	3.66E-12	-0.301083	0.7652
UHAT3(-1)	-0.378754	0.154679	-2.448646	0.0198
FITTED^2	-2.636949	4.024897	-0.655160	0.5169
FITTED^3	-15.61770	36.70370	-0.425507	0.6732

R-squared	0.436630	Mean dependent var	0.064193
Adjusted R-squared	0.317127	S.D. dependent var	0.117141
S.E. of regression	0.096801	Akaike info criterion	-1.659148
Sum squared resid	0.309222	Schwarz criterion	-1.324793
Log likelihood	42.01254	Hannan-Quinn criter.	-1.537394
F-statistic	3.653720	Durbin-Watson stat	1.586130
Prob(F-statistic)	0.005011		

Appendix 37 - Serial Correlation LM Test for Base Model

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.636741	Prob. F(2,35)	0.0858
Obs*R-squared	5.499555	Prob. Chi-Square(2)	0.0639

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 01/03/13 Time: 11:01
Sample: 1970 2011
Included observations: 42
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.111470	0.702896	0.158586	0.8749
LOG(GINI)	0.006868	0.721462	0.009519	0.9925
LOG(M2)	0.010345	0.119275	0.086733	0.9314
LOG(FDI)	-0.007313	0.039318	-0.185991	0.8535
NT	3.55E-13	2.14E-12	0.166394	0.8688
RESID(-1)	0.318925	0.170943	1.865687	0.0705
RESID(-2)	-0.271929	0.172245	-1.578736	0.1234

R-squared	0.130942	Mean dependent var	-2.97E-15
Adjusted R-squared	-0.018040	S.D. dependent var	0.164201
S.E. of regression	0.165675	Akaike info criterion	-0.606564
Sum squared resid	0.960689	Schwarz criterion	-0.316953
Log likelihood	19.73785	Hannan-Quinn criter.	-0.500410
F-statistic	0.878914	Durbin-Watson stat	2.012883
Prob(F-statistic)	0.520386		

Appendix 38 - Serial Correlation LM Test for ECM

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	4.161275	Prob. F(2,33)	0.0245
Obs*R-squared	8.257586	Prob. Chi-Square(2)	0.0161

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 01/03/13 Time: 11:02
Sample: 1971 2011
Included observations: 41
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.002042	0.015803	-0.129241	0.8980
D(LOG(GINI))	0.173326	1.007248	0.172079	0.8644
D(LOG(M2))	0.007593	0.108082	0.070250	0.9444
D(LOG(FDI))	-0.002617	0.025344	-0.103258	0.9184
D(NT)	2.34E-12	3.59E-12	0.651260	0.5194
UHAT3(-1)	-0.026873	0.137726	-0.195118	0.8465
RESID(-1)	0.366057	0.203702	1.797027	0.0815
RESID(-2)	-0.385400	0.178648	-2.157316	0.0384

R-squared	0.201405	Mean dependent var	3.38E-18
Adjusted R-squared	0.032006	S.D. dependent var	0.092543
S.E. of regression	0.091050	Akaike info criterion	-1.781628
Sum squared resid	0.273576	Schwarz criterion	-1.447273
Log likelihood	44.52338	Hannan-Quinn criter.	-1.659874
F-statistic	1.188936	Durbin-Watson stat	1.923252
Prob(F-statistic)	0.335996		

Appendix 39 - Breusch-Pagan-Godfrey Heteroskedasticity Test for Base Model

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	3.944638	Prob. F(4,37)	0.0091
Obs*R-squared	12.55622	Prob. Chi-Square(4)	0.0137
Scaled explained SS	12.41501	Prob. Chi-Square(4)	0.0145

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 01/03/13 Time: 11:03
Sample: 1970 2011
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.163883	0.148149	1.106205	0.2758
LOG(GINI)	-0.293954	0.152298	-1.930127	0.0613
LOG(M2)	0.035887	0.025988	1.380911	0.1756
LOG(FDI)	-0.024006	0.008294	-2.894483	0.0063
NT	-3.74E-13	4.82E-13	-0.775205	0.4431

R-squared	0.298958	Mean dependent var	0.026320
Adjusted R-squared	0.223169	S.D. dependent var	0.042523
S.E. of regression	0.037479	Akaike info criterion	-3.618733
Sum squared resid	0.051973	Schwarz criterion	-3.411868
Log likelihood	80.99340	Hannan-Quinn criter.	-3.542909
F-statistic	3.944638	Durbin-Watson stat	2.035047
Prob(F-statistic)	0.009146		

Appendix 40 - Breusch-Pagan-Godfrey Heteroskedasticity Test for ECM

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.311719	Prob. F(5,35)	0.2816
Obs*R-squared	6.470440	Prob. Chi-Square(5)	0.2631
Scaled explained SS	5.403562	Prob. Chi-Square(5)	0.3686

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 01/03/13 Time: 11:04
Sample: 1971 2011
Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.007676	0.002176	3.527205	0.0012
D(LOG(GINI))	-0.044129	0.138273	-0.319147	0.7515
D(LOG(M2))	-0.000696	0.014908	-0.046673	0.9630
D(LOG(FDI))	-0.003781	0.003338	-1.132512	0.2651
D(NT)	8.83E-13	4.66E-13	1.894744	0.0664
UHAT3(-1)	0.011255	0.014377	0.782840	0.4390

R-squared	0.157816	Mean dependent var	0.008355
Adjusted R-squared	0.037504	S.D. dependent var	0.012807
S.E. of regression	0.012564	Akaike info criterion	-5.781484
Sum squared resid	0.005525	Schwarz criterion	-5.530717
Log likelihood	124.5204	Hannan-Quinn criter.	-5.690168
F-statistic	1.311719	Durbin-Watson stat	2.153580
Prob(F-statistic)	0.281617		

Appendix 41 - Harvey Heteroskedasticity Test for Base Model

Heteroskedasticity Test: Harvey

F-statistic	2.288326	Prob. F(4,37)	0.0782
Obs*R-squared	8.329605	Prob. Chi-Square(4)	0.0802
Scaled explained SS	6.172642	Prob. Chi-Square(4)	0.1866

Test Equation:
Dependent Variable: LRESID2
Method: Least Squares
Date: 01/03/13 Time: 11:06
Sample: 1970 2011
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.676324	7.210941	-0.093791	0.9258
LOG(GINI)	-15.89998	7.412902	-2.144907	0.0386
LOG(M2)	0.094285	1.264923	0.074538	0.9410
LOG(FDI)	-0.743562	0.403692	-1.841906	0.0735
NT	-4.41E-11	2.35E-11	-1.879823	0.0680

R-squared	0.198324	Mean dependent var	-4.861864
Adjusted R-squared	0.111656	S.D. dependent var	1.935490
S.E. of regression	1.824238	Akaike info criterion	4.151545
Sum squared resid	123.1302	Schwarz criterion	4.358411
Log likelihood	-82.18245	Hannan-Quinn criter.	4.227370
F-statistic	2.288326	Durbin-Watson stat	2.126633
Prob(F-statistic)	0.078199		

Appendix 42 - Harvey Heteroskedasticity Test for ECM

Heteroskedasticity Test: Harvey

F-statistic	0.498212	Prob. F(5,35)	0.7754
Obs*R-squared	2.724207	Prob. Chi-Square(5)	0.7424
Scaled explained SS	4.159479	Prob. Chi-Square(5)	0.5267

Test Equation:
Dependent Variable: LRESID2
Method: Least Squares
Date: 01/03/13 Time: 11:06
Sample: 1971 2011
Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.366582	0.497228	-12.80415	0.0000
D(LOG(GINI))	-12.21422	31.59122	-0.386633	0.7014
D(LOG(M2))	-0.563906	3.405939	-0.165566	0.8695
D(LOG(FDI))	-0.720842	0.762705	-0.945113	0.3511
D(NT)	1.03E-10	1.06E-10	0.963672	0.3418
UHAT3(-1)	0.955890	3.284754	0.291008	0.7728

R-squared	0.066444	Mean dependent var	-6.298875
Adjusted R-squared	-0.066921	S.D. dependent var	2.779049
S.E. of regression	2.870531	Akaike info criterion	5.081330
Sum squared resid	288.3983	Schwarz criterion	5.332097
Log likelihood	-98.16727	Hannan-Quinn criter.	5.172646
F-statistic	0.498212	Durbin-Watson stat	2.356190
Prob(F-statistic)	0.775396		

Appendix 43 - White Heteroskedasticity Test for Base Model

Heteroskedasticity Test: White

F-statistic	3.464468	Prob. F(14,27)	0.0027
Obs*R-squared	26.98064	Prob. Chi-Square(14)	0.0194
Scaled explained SS	26.67720	Prob. Chi-Square(14)	0.0212

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 01/03/13   Time: 11:07
Sample: 1970 2011
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.435349	4.365762	0.557829	0.5816
LOG(GINI)	16.30124	8.331905	1.956485	0.0608
(LOG(GINI))^2	-1.414830	3.185596	-0.444134	0.6605
(LOG(GINI))*(LOG(M2))	-1.282915	0.998343	-1.285045	0.2097
(LOG(GINI))*(LOG(FDI))	-0.599899	0.457206	-1.312099	0.2005
(LOG(GINI))*NT	-3.75E-11	3.17E-11	-1.180448	0.2481
LOG(M2)	-0.062959	0.853600	-0.073757	0.9417
(LOG(M2))^2	0.054234	0.150632	0.360043	0.7216
(LOG(M2))*(LOG(FDI))	-0.061474	0.052329	-1.174764	0.2503
(LOG(M2))*NT	-3.62E-13	6.04E-12	-0.059994	0.9526
LOG(FDI)	0.326627	0.505537	0.646100	0.5237
(LOG(FDI))^2	-0.011468	0.013714	-0.836234	0.4104
(LOG(FDI))*NT	-2.18E-12	7.19E-13	-3.027277	0.0054
NT	1.94E-11	2.73E-11	0.709233	0.4843
NT^2	-2.18E-23	5.20E-23	-0.420110	0.6777

R-squared	0.642396	Mean dependent var	0.026320
Adjusted R-squared	0.456972	S.D. dependent var	0.042523
S.E. of regression	0.031335	Akaike info criterion	-3.815686
Sum squared resid	0.026511	Schwarz criterion	-3.195089
Log likelihood	95.12940	Hannan-Quinn criter.	-3.588212
F-statistic	3.464468	Durbin-Watson stat	2.455154
Prob(F-statistic)	0.002731		

Appendix 44 - White Heteroskedasticity Test for ECM

Heteroskedasticity Test: White

F-statistic	1.037674	Prob. F(20,20)	0.4675
Obs*R-squared	20.87902	Prob. Chi-Square(20)	0.4043
Scaled explained SS	17.43639	Prob. Chi-Square(20)	0.6245

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 01/03/13 Time: 11:08
Sample: 1971 2011
Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003760	0.004832	0.778206	0.4456
D(LOG(GINI))	-0.052569	0.293071	-0.179374	0.8594
(D(LOG(GINI)))^2	3.538464	9.724097	0.363886	0.7198
(D(LOG(GINI)))*(D(LOG(M2)))	1.464333	2.464759	0.594108	0.5591
(D(LOG(GINI)))*(D(LOG(FDI)))	0.703463	0.589438	1.193447	0.2467
(D(LOG(GINI)))*(D(NT))	-1.60E-12	7.18E-11	-0.022347	0.9824
(D(LOG(GINI)))*UHAT3(-1)	-1.967907	2.104102	-0.935272	0.3608
D(LOG(M2))	0.028102	0.064020	0.438955	0.6654
(D(LOG(M2)))^2	0.108106	0.232742	0.464486	0.6473
(D(LOG(M2)))*(D(LOG(FDI)))	-0.142008	0.111683	-1.271528	0.2181
(D(LOG(M2)))*(D(NT))	-1.33E-11	1.32E-11	-1.003087	0.3278
(D(LOG(M2)))*UHAT3(-1)	-0.229857	0.531393	-0.432555	0.6700
D(LOG(FDI))	0.010393	0.009596	1.083072	0.2917
(D(LOG(FDI)))^2	0.006166	0.008071	0.763987	0.4538
(D(LOG(FDI)))*(D(NT))	-2.22E-12	1.28E-12	-1.731940	0.0987
(D(LOG(FDI)))*UHAT3(-1)	-0.105307	0.068662	-1.533694	0.1408
D(NT)	1.17E-12	1.23E-12	0.950692	0.3531
(D(NT))^2	-1.51E-22	1.55E-22	-0.976224	0.3406
(D(NT))*UHAT3(-1)	-1.16E-13	6.62E-12	-0.017568	0.9862
UHAT3(-1)	0.014923	0.028985	0.514871	0.6123
UHAT3(-1)^2	0.088345	0.147056	0.600754	0.5548

R-squared	0.509244	Mean dependent var	0.008355
Adjusted R-squared	0.018489	S.D. dependent var	0.012807
S.E. of regression	0.012688	Akaike info criterion	-5.589829
Sum squared resid	0.003220	Schwarz criterion	-4.712146
Log likelihood	135.5915	Hannan-Quinn criter.	-5.270226
F-statistic	1.037674	Durbin-Watson stat	2.342332
Prob(F-statistic)	0.467456		

Appendix 45 - ARCH Heteroskedasticity Test for Base Model

Heteroskedasticity Test: ARCH

F-statistic	0.193306	Prob. F(1,39)	0.6626
Obs*R-squared	0.202217	Prob. Chi-Square(1)	0.6529

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 01/03/13 Time: 11:09
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.028809	0.008007	3.598054	0.0009
RESID^2(-1)	-0.070163	0.159582	-0.439666	0.6626

R-squared	0.004932	Mean dependent var	0.026925
Adjusted R-squared	-0.020582	S.D. dependent var	0.042868
S.E. of regression	0.043307	Akaike info criterion	-3.393456
Sum squared resid	0.073144	Schwarz criterion	-3.309867
Log likelihood	71.56584	Hannan-Quinn criter.	-3.363017
F-statistic	0.193306	Durbin-Watson stat	1.972814
Prob(F-statistic)	0.662606		

Appendix 46 - ARCH Heteroskedasticity Test for ECM

Heteroskedasticity Test: ARCH

F-statistic	1.618246	Prob. F(1,38)	0.2111
Obs*R-squared	1.633839	Prob. Chi-Square(1)	0.2012

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 01/03/13 Time: 11:09
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.010139	0.002437	4.160707	0.0002
RESID^2(-1)	-0.202198	0.158948	-1.272103	0.2111

R-squared	0.040846	Mean dependent var	0.008430
Adjusted R-squared	0.015605	S.D. dependent var	0.012961
S.E. of regression	0.012859	Akaike info criterion	-5.820831
Sum squared resid	0.006283	Schwarz criterion	-5.736387
Log likelihood	118.4166	Hannan-Quinn criter.	-5.790299
F-statistic	1.618246	Durbin-Watson stat	1.974124
Prob(F-statistic)	0.211066		

Appendix 47 - Squared Residuals Correlogram for Base Model

Date: 01/03/13 Time: 11:11
Sample: 1970 2011
Included observations: 42

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.070	-0.070	0.2178	0.641
		2	0.197	0.193	2.0033	0.367
		3	0.039	0.067	2.0765	0.557
		4	-0.002	-0.035	2.0768	0.722
		5	-0.041	-0.067	2.1596	0.827
		6	0.102	0.105	2.6910	0.847
		7	-0.094	-0.061	3.1592	0.870
		8	0.123	0.083	3.9878	0.858
		9	-0.132	-0.110	4.9582	0.838
		10	0.248	0.227	8.4973	0.580
		11	-0.090	-0.044	8.9811	0.624
		12	0.132	0.058	10.056	0.611
		13	0.015	0.024	10.071	0.688
		14	-0.029	-0.070	10.127	0.753
		15	-0.056	-0.038	10.339	0.798
		16	-0.156	-0.240	12.069	0.739
		17	-0.070	0.026	12.434	0.773
		18	-0.145	-0.200	14.044	0.726
		19	-0.149	-0.061	15.823	0.669
		20	0.126	0.101	17.153	0.643

Appendix 48 - Squared Residuals Correlogram for ECM

Date: 01/03/13 Time: 11:13
Sample: 1971 2011
Included observations: 41

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.202	-0.202	1.7928	0.181
		2	0.085	0.046	2.1173	0.347
		3	0.013	0.040	2.1246	0.547
		4	-0.005	0.001	2.1259	0.713
		5	-0.133	-0.145	2.9984	0.700
		6	0.136	0.089	3.9352	0.685
		7	-0.115	-0.056	4.6156	0.707
		8	-0.061	-0.108	4.8135	0.777
		9	-0.012	-0.045	4.8209	0.850
		10	-0.014	-0.019	4.8313	0.902
		11	-0.051	-0.029	4.9867	0.932
		12	0.067	0.020	5.2620	0.949
		13	0.151	0.186	6.7001	0.917
		14	-0.075	-0.015	7.0638	0.932
		15	-0.099	-0.181	7.7236	0.934
		16	0.051	-0.015	7.9042	0.952
		17	0.080	0.161	8.3719	0.958
		18	-0.147	-0.110	10.029	0.931
		19	0.090	-0.047	10.685	0.934
		20	-0.048	0.020	10.880	0.949

Appendix 49 - FGLS Estimation for Model 3

Dependent Variable: LOG(GDP)
Method: Least Squares
Date: 12/20/12 Time: 20:51
Sample: 1970 2011
Included observations: 42
Weighting series: 1/UHAT3F_GLES
Weight type: Inverse standard deviation (EViews default scaling)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.42899	0.581750	26.52168	0.0000
LOG(GINI)	-1.278305	0.330172	-3.871632	0.0004
LOG(M2)	0.677685	0.080060	8.464748	0.0000
LOG(FDI)	0.247490	0.035288	7.013471	0.0000
NT	1.49E-11	1.82E-12	8.196485	0.0000

Weighted Statistics

R-squared	0.979241	Mean dependent var	24.77878
Adjusted R-squared	0.976996	S.D. dependent var	21.47446
S.E. of regression	0.117502	Akaike info criterion	-1.333374
Sum squared resid	0.510851	Schwarz criterion	-1.126508
Log likelihood	33.00085	Hannan-Quinn criter.	-1.257549
F-statistic	436.3291	Durbin-Watson stat	1.381269
Prob(F-statistic)	0.000000	Weighted mean dep.	24.47828

Unweighted Statistics

R-squared	0.937027	Mean dependent var	24.96305
Adjusted R-squared	0.930219	S.D. dependent var	0.675844
S.E. of regression	0.178531	Sum squared resid	1.179317
Durbin-Watson stat	1.221371		

Appendix 50 - ARCH Estimation for Model 3

Dependent Variable: LOG(GDP)
Method: ML - ARCH
Date: 12/20/12 Time: 20:54
Sample: 1970 2011
Included observations: 42
Convergence achieved after 1 iteration
Presample variance: backcast (parameter = 0.7)
GARCH = C(6) + C(7)*RESID(-1)^2 + C(8)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	14.93942	1.361426	10.97336	0.0000
LOG(GINI)	-0.891479	2.085266	-0.427513	0.6690
LOG(M2)	0.603172	0.322232	1.871858	0.0612
LOG(FDI)	0.298601	0.067822	4.402739	0.0000
NT	1.57E-11	1.56E-11	1.003424	0.3157
		Variance Equation		
C	0.017108	0.043260	0.395465	0.6925
RESID(-1)^2	0.150000	0.492007	0.304873	0.7605
GARCH(-1)	0.600000	0.963277	0.622874	0.5334

R-squared	0.940972	Mean dependent var	24.96305
Adjusted R-squared	0.934591	S.D. dependent var	0.675844
S.E. of regression	0.172849	Akaike info criterion	-0.269795
Sum squared resid	1.105436	Schwarz criterion	0.061189
Log likelihood	13.66571	Hannan-Quinn criter.	-0.148477
Durbin-Watson stat	1.505645		

Appendix 51 - Breusch-Pagan-Godfrey Heteroskedasticity Test for FGLS Estimation of Model 3

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.643349	Prob. F(4,37)	0.6350
Obs*R-squared	2.731193	Prob. Chi-Square(4)	0.6038
Scaled explained SS	1.356445	Prob. Chi-Square(4)	0.8517

Test Equation:
Dependent Variable: WGT_RESID^2
Method: Least Squares
Date: 01/04/13 Time: 20:02
Sample: 1970 2011
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.026761	0.016638	1.608427	0.1162
LOG(GINI)*WGT	0.096818	0.140209	0.690529	0.4942
LOG(M2)*WGT	-0.019099	0.016525	-1.155766	0.2552
LOG(FDI)*WGT	0.006384	0.006621	0.964061	0.3413
NT*WGT	1.93E-13	4.35E-13	0.444256	0.6594

R-squared	0.065028	Mean dependent var	0.012163
Adjusted R-squared	-0.036050	S.D. dependent var	0.013927
S.E. of regression	0.014176	Akaike info criterion	-5.563179
Sum squared resid	0.007436	Schwarz criterion	-5.356314
Log likelihood	121.8268	Hannan-Quinn criter.	-5.487355
F-statistic	0.643349	Durbin-Watson stat	1.893485
Prob(F-statistic)	0.635024		

Appendix 52 - Harvey Heteroskedasticity Test for FGLS Estimation of Model 3

Heteroskedasticity Test: Harvey

F-statistic	2.167458	Prob. F(4,37)	0.0918
Obs*R-squared	7.973162	Prob. Chi-Square(4)	0.0926
Scaled explained SS	4.499108	Prob. Chi-Square(4)	0.3427

Test Equation:
Dependent Variable: LWRESID2
Method: Least Squares
Date: 01/04/13 Time: 20:02
Sample: 1970 2011
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.355503	1.878213	-2.318961	0.0260
LOG(GINI)*WGT	1.720687	15.82750	0.108715	0.9140
LOG(M2)*WGT	-1.074951	1.865424	-0.576250	0.5679
LOG(FDI)*WGT	0.254180	0.747466	0.340056	0.7357
NT*WGT	-3.78E-11	4.91E-11	-0.769358	0.4466

R-squared	0.189837	Mean dependent var	-5.230895
Adjusted R-squared	0.102252	S.D. dependent var	1.688945
S.E. of regression	1.600268	Akaike info criterion	3.889563
Sum squared resid	94.75174	Schwarz criterion	4.096428
Log likelihood	-76.68082	Hannan-Quinn criter.	3.965387
F-statistic	2.167458	Durbin-Watson stat	1.791652
Prob(F-statistic)	0.091824		

Appendix 53 - White Heteroskedasticity Test for FGLS Estimation of Model 3

Heteroskedasticity Test: White

F-statistic	2.263710	Prob. F(14,27)	0.0333
Obs*R-squared	22.67878	Prob. Chi-Square(14)	0.0657
Scaled explained SS	11.26340	Prob. Chi-Square(14)	0.6652

Test Equation:
Dependent Variable: WGT_RESID^2
Method: Least Squares
Date: 01/04/13 Time: 20:04
Sample: 1970 2011
Included observations: 42
Collinear test regressors dropped from specification

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.027865	0.082048	0.339617	0.7368
WGT^2	-4.743058	4.100376	-1.156737	0.2575
(LOG(GINI))^2*WGT^2	-2.453026	6.573996	-0.373141	0.7120
(LOG(GINI))*WGT^2	14.98927	7.700352	1.946570	0.0621
(LOG(GINI))*(LOG(M2))*WGT^2	-1.322548	1.113042	-1.188228	0.2451
(LOG(GINI))*(LOG(FDI))*WGT^2	-0.597854	0.895432	-0.667671	0.5100
(LOG(GINI))*NT*WGT^2	1.17E-11	2.58E-11	0.453041	0.6541
(LOG(M2))^2*WGT^2	-0.139894	0.149415	-0.936281	0.3574
(LOG(M2))*WGT^2	-0.418318	0.722537	-0.578957	0.5674
(LOG(M2))*(LOG(FDI))*WGT^2	0.029885	0.095511	0.312892	0.7568
(LOG(M2))*NT*WGT^2	2.30E-12	4.72E-12	0.488242	0.6293
(LOG(FDI))^2*WGT^2	-0.037232	0.036423	-1.022203	0.3158
(LOG(FDI))*WGT^2	1.035942	0.703989	1.471531	0.1527
(LOG(FDI))*NT*WGT^2	-1.16E-13	1.24E-12	-0.093534	0.9262
NT^2*WGT^2	1.06E-23	4.29E-23	0.247178	0.8066

R-squared	0.539971	Mean dependent var	0.012163
Adjusted R-squared	0.301437	S.D. dependent var	0.013927
S.E. of regression	0.011640	Akaike info criterion	-5.796215
Sum squared resid	0.003658	Schwarz criterion	-5.175619
Log likelihood	136.7205	Hannan-Quinn criter.	-5.568742
F-statistic	2.263710	Durbin-Watson stat	2.351315
Prob(F-statistic)	0.033267		

Appendix 54 - ARCH Heteroskedasticity Test for FGLS Estimation of Model 3

Heteroskedasticity Test: ARCH

F-statistic	0.180302	Prob. F(1,39)	0.6734
Obs*R-squared	0.188676	Prob. Chi-Square(1)	0.6640

Test Equation:
Dependent Variable: WGT_RESID^2
Method: Least Squares
Date: 01/04/13 Time: 20:05
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.011602	0.002936	3.951741	0.0003
WGT_RESID^2(-1)	0.067345	0.158602	0.424620	0.6734

R-squared	0.004602	Mean dependent var	0.012423
Adjusted R-squared	-0.020921	S.D. dependent var	0.013996
S.E. of regression	0.014142	Akaike info criterion	-5.631776
Sum squared resid	0.007800	Schwarz criterion	-5.548187
Log likelihood	117.4514	Hannan-Quinn criter.	-5.601338
F-statistic	0.180302	Durbin-Watson stat	2.034943
Prob(F-statistic)	0.673447		

Appendix 55 - ARCH LM Heteroskedasticity Test for ARCH Estimation of Model 3

Heteroskedasticity Test: ARCH

F-statistic	0.543138	Prob. F(1,39)	0.4655
Obs*R-squared	0.563149	Prob. Chi-Square(1)	0.4530

Test Equation:
Dependent Variable: WGT_RESID^2
Method: Least Squares
Date: 01/04/13 Time: 20:06
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.580711	0.150384	3.861522	0.0004
WGT_RESID^2(-1)	-0.117169	0.158986	-0.736979	0.4655

R-squared	0.013735	Mean dependent var	0.519841
Adjusted R-squared	-0.011554	S.D. dependent var	0.800090
S.E. of regression	0.804698	Akaike info criterion	2.450852
Sum squared resid	25.25403	Schwarz criterion	2.534440
Log likelihood	-48.24246	Hannan-Quinn criter.	2.481290
F-statistic	0.543138	Durbin-Watson stat	1.973833
Prob(F-statistic)	0.465546		

Appendix 56 - VECM Specification for Model 3

Vector Error Correction Estimates
Date: 12/20/12 Time: 20:52
Sample (adjusted): 1973 2011
Included observations: 39 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1	CointEq2	CointEq3	CointEq4	
LOG(GDP(-1))	1.000000	0.000000	0.000000	0.000000	
LOG(GINI(-1))	0.000000	1.000000	0.000000	0.000000	
LOG(M2(-1))	0.000000	0.000000	1.000000	0.000000	
LOG(FDI(-1))	0.000000	0.000000	0.000000	1.000000	
NT(-1)	-2.00E-11	-5.61E-13	-5.49E-12	-2.11E-14	
	(1.5E-11)	(2.1E-12)	(7.2E-12)	(2.8E-11)	
	[-1.36436]	[-0.26597]	[-0.75997]	[-0.00076]	
C	-24.79551	0.754731	-4.554921	-21.59833	
Error Correction:	**D(LOG(GDP))**	**D(LOG(GINI))**	**D(LOG(M2))**	**D(LOG(FDI))**	**D(NT)**
CointEq1	-0.214034	0.000675	0.279604	2.304108	1.50E+10
	(0.20180)	(0.02196)	(0.27636)	(1.08951)	(8.7E+09)
	[-1.06064]	[0.03074]	[1.01175]	[2.11481]	[1.73574]
CointEq2	-1.359047	-0.178256	0.542732	-7.115873	2.68E+10
	(0.53003)	(0.05768)	(0.72587)	(2.86167)	(2.3E+10)
	[-2.56408]	[-3.09018]	[0.74770]	[-2.48662]	[1.17634]
CointEq3	-0.223826	-0.029072	-0.420528	-2.599693	-3.74E+09
	(0.18785)	(0.02044)	(0.25726)	(1.01421)	(8.1E+09)
	[-1.19151]	[-1.42204]	[-1.63466]	[-2.56327]	[-0.46364]
CointEq4	0.064861	-0.003363	-0.024806	-1.258051	-3.79E+09
	(0.07916)	(0.00862)	(0.10841)	(0.42738)	(3.4E+09)
	[0.81937]	[-0.39032]	[-0.22882]	[-2.94361]	[-1.11513]
D(LOG(GDP(-1)))	0.208310	-0.007589	-0.093287	-1.211700	-1.81E+10
	(0.21217)	(0.02309)	(0.29056)	(1.14551)	(9.1E+09)
	[0.98181]	[-0.32867]	[-0.32106]	[-1.05778]	[-1.98655]
D(LOG(GDP(-2)))	-0.482758	-0.004211	0.084915	-1.711561	-1.14E+10
	(0.22276)	(0.02424)	(0.30506)	(1.20267)	(9.6E+09)
	[-2.16721]	[-0.17370]	[0.27835]	[-1.42314]	[-1.18678]
D(LOG(GINI(-1)))	-3.181284	0.514737	1.345270	-17.04089	-2.46E+10
	(1.61852)	(0.17615)	(2.21654)	(8.73845)	(7.0E+10)
	[-1.96555]	[2.92221]	[0.60692]	[-1.95010]	[-0.35357]

D(LOG(GINI(-2)))	2.945848	-0.118687	-1.188829	16.57056	6.88E+10
	(1.54848)	(0.16852)	(2.12061)	(8.36027)	(6.7E+10)
	[1.90242]	[-0.70427]	[-0.56061]	[1.98206]	[1.03374]
D(LOG(M2(-1)))	0.111283	0.026154	0.074924	0.887205	3.55E+09
	(0.15470)	(0.01684)	(0.21185)	(0.83520)	(6.6E+09)
	[0.71937]	[1.55347]	[0.35366]	[1.06226]	[0.53421]
D(LOG(M2(-2)))	0.052761	0.012517	-0.257667	0.526418	-6.41E+08
	(0.14005)	(0.01524)	(0.19180)	(0.75615)	(6.0E+09)
	[0.37673]	[0.82118]	[-1.34341]	[0.69618]	[-0.10659]
D(LOG(FDI(-1)))	-0.086713	0.005234	-0.021849	0.255458	4.09E+09
	(0.05964)	(0.00649)	(0.08167)	(0.32199)	(2.6E+09)
	[-1.45396]	[0.80646]	[-0.26752]	[0.79336]	[1.59633]
D(LOG(FDI(-2)))	-0.016203	0.006961	-0.056968	0.255144	2.54E+09
	(0.04709)	(0.00513)	(0.06450)	(0.25426)	(2.0E+09)
	[-0.34406]	[1.35824]	[-0.88329]	[1.00346]	[1.25611]
D(NT(-1))	-1.06E-11	-6.73E-13	8.36E-12	-2.14E-11	0.041626
	(4.8E-12)	(5.2E-13)	(6.5E-12)	(2.6E-11)	(0.20494)
	[-2.21685]	[-1.29668]	[1.27963]	[-0.83067]	[0.20311]
D(NT(-2))	-8.45E-12	-1.13E-13	2.45E-12	-8.90E-12	0.184008
	(4.7E-12)	(5.1E-13)	(6.4E-12)	(2.5E-11)	(0.20151)
	[-1.80181]	[-0.22120]	[0.38071]	[-0.35135]	[0.91314]
C	0.097143	-0.003091	0.031740	0.205996	2.23E+09
	(0.02514)	(0.00274)	(0.03442)	(0.13571)	(1.1E+09)
	[3.86473]	[-1.12986]	[0.92207]	[1.51792]	[2.06181]
R-squared	0.502240	0.612329	0.435174	0.576667	0.367927
Adj. R-squared	0.211880	0.386188	0.105693	0.329723	-0.000782
Sum sq. resids	0.269303	0.003190	0.505075	7.850070	4.97E+20
S.E. equation	0.105929	0.011528	0.145068	0.571915	4.55E+09
F-statistic	1.729713	2.707729	1.320785	2.335216	0.997878
Log likelihood	41.68323	128.1833	29.42030	-24.07934	-913.1789
Akaike AIC	-1.368371	-5.804273	-0.739503	2.004069	47.59892
Schwarz SC	-0.728539	-5.164442	-0.099671	2.643900	48.23875
Mean dependent	0.064000	-0.004296	0.029726	0.079358	9.32E+08
S.D. dependent	0.119322	0.014715	0.153401	0.698561	4.55E+09

Determinant resid covariance (dof adj.)	1.05E+11
Determinant resid covariance	9.24E+09
Log likelihood	-724.1641
Akaike information criterion	42.00841
Schwarz criterion	46.06068

Appendix 57 - Granger Causality Test

VEC Granger Causality/Block Exogeneity Wald Tests
Date: 01/04/13 Time: 20:08
Sample: 1970 2011
Included observations: 39

Dependent variable: D(LOG(GDP))

Excluded	Chi-sq	df	Prob.
D(LOG(GINI))	4.810624	2	0.0902
D(LOG(M2))	0.540055	2	0.7634
D(LOG(FDI))	3.049271	2	0.2177
D(NT)	6.410484	2	0.0405
All	11.61456	8	0.1692

Dependent variable: D(LOG(GINI))

Excluded	Chi-sq	df	Prob.
D(LOG(GDP))	0.121018	2	0.9413
D(LOG(M2))	2.523814	2	0.2831
D(LOG(FDI))	1.892122	2	0.3883
D(NT)	1.704778	2	0.4264
All	8.335479	8	0.4014

Dependent variable: D(LOG(M2))

Excluded	Chi-sq	df	Prob.
D(LOG(GDP))	0.221957	2	0.8950
D(LOG(GINI))	0.440309	2	0.8024
D(LOG(FDI))	1.035028	2	0.5960
D(NT)	1.637799	2	0.4409
All	3.731567	8	0.8805

Dependent variable: D(LOG(FDI))

Excluded	Chi-sq	df	Prob.
D(LOG(GDP))	2.673048	2	0.2628
D(LOG(GINI))	4.968142	2	0.0834
D(LOG(M2))	1.265159	2	0.5312
D(NT)	0.704575	2	0.7031
All	8.688888	8	0.3692

Dependent variable: D(NT)

Excluded	Chi-sq	df	Prob.
D(LOG(GDP))	4.632621	2	0.0986
D(LOG(GINI))	1.139789	2	0.5656
D(LOG(M2))	0.373690	2	0.8296
D(LOG(FDI))	2.580771	2	0.2752
All	7.338445	8	0.5006

Appendix 58 - FMOLS Estimation of Model 3

Dependent Variable: LOG(GDP)
Method: Fully Modified Least Squares (FMOLS)
Date: 12/20/12 Time: 20:51
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments
Cointegrating equation deterministics: C
Long-run covariance estimate (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GINI)	-0.357419	0.723410	-0.494075	0.6243
LOG(M2)	0.653909	0.130133	5.024914	0.0000
LOG(FDI)	0.348847	0.038694	9.015464	0.0000
NT	1.67E-11	2.21E-12	7.557243	0.0000
C	14.01624	0.727489	19.26658	0.0000

R-squared	0.928814	Mean dependent var	24.99653
Adjusted R-squared	0.920905	S.D. dependent var	0.648011
S.E. of regression	0.182246	Sum squared resid	1.195689
Durbin-Watson stat	1.752895	Long-run variance	0.029338

Appendix 59 - CCR Estimation of Model 3

Dependent Variable: LOG(GDP)
Method: Canonical Cointegrating Regression (CCR)
Date: 12/20/12 Time: 20:50
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments
Cointegrating equation deterministics: C
Long-run covariance estimate (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GINI)	-0.438706	0.665166	-0.659544	0.5137
LOG(M2)	0.614700	0.120671	5.094024	0.0000
LOG(FDI)	0.355269	0.041835	8.492225	0.0000
NT	1.71E-11	2.26E-12	7.576408	0.0000
C	13.99444	0.722895	19.35887	0.0000

R-squared	0.928005	Mean dependent var	24.99653
Adjusted R-squared	0.920005	S.D. dependent var	0.648011
S.E. of regression	0.183279	Sum squared resid	1.209283
Durbin-Watson stat	1.762570	Long-run variance	0.029338

Appendix 60 - DOLS Estimation of Model 3

Dependent Variable: LOG(GDP)
Method: Dynamic Least Squares (DOLS)
Date: 12/20/12 Time: 20:50
Sample (adjusted): 1972 2010
Included observations: 39 after adjustments
Cointegrating equation deterministics: C
Fixed leads and lags specification (lead=1, lag=1)
Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GINI)	0.059469	0.948708	0.062684	0.9506
LOG(M2)	0.646237	0.193804	3.334477	0.0030
LOG(FDI)	0.391346	0.047598	8.221963	0.0000
NT	1.65E-11	2.13E-12	7.723430	0.0000
C	13.47208	0.852468	15.80361	0.0000

R-squared	0.970928	Mean dependent var	25.00103
Adjusted R-squared	0.949785	S.D. dependent var	0.592306
S.E. of regression	0.132729	Sum squared resid	0.387571
Durbin-Watson stat	1.251187	Long-run variance	0.017998

Appendix 61 - Hansen Parameter Instability Cointegration Test for FMOLS Estimation of Model 3

Cointegration Test - Hansen Parameter Instability
Date: 01/04/13 Time: 20:12
Equation: MODEL3_FMOLS
Series: LOG(GDP) LOG(GINI) LOG(M2) LOG(FDI) NT
Null hypothesis: Series are cointegrated
Cointegrating equation deterministics: C

Lc statistic	Stochastic Trends (m)	Deterministic Trends (k)	Excluded Trends (p2)	Prob.*
0.643503	4	0	0	0.1838

*Hansen (1992b) Lc(m2=4, k=0) p-values, where m2=m-p2 is the number of stochastic trends in the asymptotic distribution

Appendix 62 - Hansen Parameter Instability Cointegration Test for CCR Estimation of Model 3

Cointegration Test - Hansen Parameter Instability
Date: 01/04/13 Time: 20:14
Equation: MODEL3_CCR
Series: LOG(GDP) LOG(GINI) LOG(M2) LOG(FDI) NT
Null hypothesis: Series are cointegrated
Cointegrating equation deterministics: C

Lc statistic	Stochastic Trends (m)	Deterministic Trends (k)	Excluded Trends (p2)	Prob.*
0.279830	4	0	0	> 0.2

*Hansen (1992b) Lc(m2=4, k=0) p-values, where m2=m-p2 is the number of stochastic trends in the asymptotic distribution

Appendix 63 - Hansen Parameter Instability Cointegration Test for DOLS Estimation of Model 3

Cointegration Test - Hansen Parameter Instability
Date: 01/04/13 Time: 20:14
Equation: MODEL3_DOLS
Series: LOG(GDP) LOG(GINI) LOG(M2) LOG(FDI) NT
Null hypothesis: Series are cointegrated
Cointegrating equation deterministics: C

Lc statistic	Stochastic Trends (m)	Deterministic Trends (k)	Excluded Trends (p2)	Prob.*
0.066903	4	0	0	> 0.2

*Hansen (1992b) Lc(m2=4, k=0) p-values, where m2=m-p2 is the number of stochastic trends in the asymptotic distribution

Appendix 64 - Engle-Granger Cointegration Test for FMOLS Estimation of Model 3

Cointegration Test - Engle-Granger
Date: 01/04/13 Time: 20:14
Equation: MODEL3_FMOLS
Specification: LOG(GDP) LOG(GINI) LOG(M2) LOG(FDI) NT C
Cointegrating equation deterministics: C
Null hypothesis: Series are not cointegrated
Automatic lag specification (lag=0 based on Schwarz Info Criterion, maxlag=9)

	Value	Prob.*
Engle-Granger tau-statistic	-4.915803	0.0370
Engle-Granger z-statistic	-30.93601	0.0311

*MacKinnon (1996) p-values.

Intermediate Results:	
Rho - 1	-0.754537
Rho S.E.	0.153492
Residual variance	0.025939
Long-run residual variance	0.025939
Number of lags	0
Number of observations	41
Number of stochastic trends**	5

**Number of stochastic trends in asymptotic distribution.

Engle-Granger Test Equation:
Dependent Variable: D(RESID)
Method: Least Squares
Date: 01/04/13 Time: 20:14
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.754537	0.153492	-4.915803	0.0000

R-squared	0.376506	Mean dependent var	0.002579
Adjusted R-squared	0.376506	S.D. dependent var	0.203968
S.E. of regression	0.161057	Akaike info criterion	-0.790033
Sum squared resid	1.037570	Schwarz criterion	-0.748239
Log likelihood	17.19569	Hannan-Quinn criter.	-0.774814
Durbin-Watson stat	1.862016		

Appendix 65 - Engle-Granger Cointegration Test for CCR Estimation of Model 3

Cointegration Test - Engle-Granger
Date: 01/04/13 Time: 20:16
Equation: MODEL3_CCR
Specification: LOG(GDP) LOG(GINI) LOG(M2) LOG(FDI) NT C
Cointegrating equation deterministics: C
Null hypothesis: Series are not cointegrated
Automatic lag specification (lag=0 based on Schwarz Info Criterion, maxlag=9)

	Value	Prob.*
Engle-Granger tau-statistic	-4.915803	0.0370
Engle-Granger z-statistic	-30.93601	0.0311

*MacKinnon (1996) p-values.

Intermediate Results:	
Rho - 1	-0.754537
Rho S.E.	0.153492
Residual variance	0.025939
Long-run residual variance	0.025939
Number of lags	0
Number of observations	41
Number of stochastic trends**	5

**Number of stochastic trends in asymptotic distribution.

Engle-Granger Test Equation:
Dependent Variable: D(RESID)
Method: Least Squares
Date: 01/04/13 Time: 20:16
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.754537	0.153492	-4.915803	0.0000

R-squared	0.376506	Mean dependent var	0.002579
Adjusted R-squared	0.376506	S.D. dependent var	0.203968
S.E. of regression	0.161057	Akaike info criterion	-0.790033
Sum squared resid	1.037570	Schwarz criterion	-0.748239
Log likelihood	17.19569	Hannan-Quinn criter.	-0.774814
Durbin-Watson stat	1.862016		

Appendix 66 - Engle-Granger Cointegration Test for DOLS Estimation of Model 3

Cointegration Test - Engle-Granger
Date: 01/04/13 Time: 20:17
Equation: MODEL3_DOLS
Specification: LOG(GDP) LOG(GINI) LOG(M2) LOG(FDI) NT C
Cointegrating equation deterministics: C
Null hypothesis: Series are not cointegrated
Automatic lag specification (lag=0 based on Schwarz Info Criterion, maxlag=9)

	Value	Prob.*
Engle-Granger tau-statistic	-4.915803	0.0370
Engle-Granger z-statistic	-30.93601	0.0311

*MacKinnon (1996) p-values.

Intermediate Results:	
Rho - 1	-0.754537
Rho S.E.	0.153492
Residual variance	0.025939
Long-run residual variance	0.025939
Number of lags	0
Number of observations	41
Number of stochastic trends**	5

**Number of stochastic trends in asymptotic distribution.

Engle-Granger Test Equation:
Dependent Variable: D(RESID)
Method: Least Squares
Date: 01/04/13 Time: 20:17
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.754537	0.153492	-4.915803	0.0000

R-squared	0.376506	Mean dependent var	0.002579
Adjusted R-squared	0.376506	S.D. dependent var	0.203968
S.E. of regression	0.161057	Akaike info criterion	-0.790033
Sum squared resid	1.037570	Schwarz criterion	-0.748239
Log likelihood	17.19569	Hannan-Quinn criter.	-0.774814
Durbin-Watson stat	1.862016		

Appendix 67 - Phillips-Ouliaris Cointegration Test for FMOLS Estimation of Model 3

Cointegration Test - Phillips-Ouliaris
Date: 01/04/13 Time: 20:17
Equation: MODEL3_FMOLS
Specification: LOG(GDP) LOG(GINI) LOG(M2) LOG(FDI) NT C
Cointegrating equation deterministics: C
Null hypothesis: Series are not cointegrated
Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

	Value	Prob.*
Phillips-Ouliaris tau-statistic	-4.800650	0.0467
Phillips-Ouliaris z-statistic	-26.65172	0.0904

*MacKinnon (1996) p-values.

Intermediate Results:	
Rho - 1	-0.754537
Bias corrected Rho - 1 (Rho* - 1)	-0.650042
Rho* S.E.	0.135407
Residual variance	0.025939
Long-run residual variance	0.020187
Long-run residual autocovariance	-0.002876
Number of observations	41
Number of stochastic trends**	5

**Number of stochastic trends in asymptotic distribution.

Phillips-Ouliaris Test Equation:
Dependent Variable: D(RESID)
Method: Least Squares
Date: 01/04/13 Time: 20:17
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.754537	0.153492	-4.915803	0.0000

R-squared	0.376506	Mean dependent var	0.002579
Adjusted R-squared	0.376506	S.D. dependent var	0.203968
S.E. of regression	0.161057	Akaike info criterion	-0.790033
Sum squared resid	1.037570	Schwarz criterion	-0.748239
Log likelihood	17.19569	Hannan-Quinn criter.	-0.774814
Durbin-Watson stat	1.862016		

Appendix 68 - Phillips-Ouliaris Cointegration Test for CCR Estimation of Model 3

Cointegration Test - Phillips-Ouliaris
Date: 01/04/13 Time: 20:18
Equation: MODEL3_CCR
Specification: LOG(GDP) LOG(GINI) LOG(M2) LOG(FDI) NT C
Cointegrating equation deterministics: C
Null hypothesis: Series are not cointegrated
Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

	Value	Prob.*
Phillips-Ouliaris tau-statistic	-4.800650	0.0467
Phillips-Ouliaris z-statistic	-26.65172	0.0904

*MacKinnon (1996) p-values.

Intermediate Results:	
Rho - 1	-0.754537
Bias corrected Rho - 1 (Rho* - 1)	-0.650042
Rho* S.E.	0.135407
Residual variance	0.025939
Long-run residual variance	0.020187
Long-run residual autocovariance	-0.002876
Number of observations	41
Number of stochastic trends**	5

**Number of stochastic trends in asymptotic distribution.

Phillips-Ouliaris Test Equation:
Dependent Variable: D(RESID)
Method: Least Squares
Date: 01/04/13 Time: 20:18
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.754537	0.153492	-4.915803	0.0000

R-squared	0.376506	Mean dependent var	0.002579
Adjusted R-squared	0.376506	S.D. dependent var	0.203968
S.E. of regression	0.161057	Akaike info criterion	-0.790033
Sum squared resid	1.037570	Schwarz criterion	-0.748239
Log likelihood	17.19569	Hannan-Quinn criter.	-0.774814
Durbin-Watson stat	1.862016		

Appendix 69 - Phillips-Ouliaris Cointegration Test for FMOLS Estimation of Model 3

Cointegration Test - Phillips-Ouliaris
Date: 01/04/13 Time: 20:19
Equation: MODEL3_DOLS
Specification: LOG(GDP) LOG(GINI) LOG(M2) LOG(FDI) NT C
Cointegrating equation deterministics: C
Null hypothesis: Series are not cointegrated
Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

	Value	Prob.*
Phillips-Ouliaris tau-statistic	-4.800650	0.0467
Phillips-Ouliaris z-statistic	-26.65172	0.0904

*MacKinnon (1996) p-values.

Intermediate Results:	
Rho - 1	-0.754537
Bias corrected Rho - 1 (Rho* - 1)	-0.650042
Rho* S.E.	0.135407
Residual variance	0.025939
Long-run residual variance	0.020187
Long-run residual autocovariance	-0.002876
Number of observations	41
Number of stochastic trends**	5

**Number of stochastic trends in asymptotic distribution.

Phillips-Ouliaris Test Equation:
Dependent Variable: D(RESID)
Method: Least Squares
Date: 01/04/13 Time: 20:19
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.754537	0.153492	-4.915803	0.0000

R-squared	0.376506	Mean dependent var	0.002579
Adjusted R-squared	0.376506	S.D. dependent var	0.203968
S.E. of regression	0.161057	Akaike info criterion	-0.790033
Sum squared resid	1.037570	Schwarz criterion	-0.748239
Log likelihood	17.19569	Hannan-Quinn criter.	-0.774814
Durbin-Watson stat	1.862016		

Appendix 70 - OLS Estimation for Moderating Effects of Financial Development on Income Inequality

Dependent Variable: ZGDP
Method: Least Squares
Date: 11/28/12 Time: 00:31
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments
Convergence achieved after 12 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.387570	1.015550	-1.366324	0.1803
ZGINI	0.094648	0.161019	0.587808	0.5603
ZM2	-0.042221	0.116537	-0.362296	0.7192
ZGINI*ZM2	0.102029	0.126315	0.807741	0.4245
AR(1)	1.074336	0.040641	26.43501	0.0000

R-squared	0.955590	Mean dependent var	0.029472
Adjusted R-squared	0.950655	S.D. dependent var	0.993784
S.E. of regression	0.220755	Akaike info criterion	-0.069673
Sum squared resid	1.754386	Schwarz criterion	0.139299
Log likelihood	6.428306	Hannan-Quinn criter.	0.006423
F-statistic	193.6568	Durbin-Watson stat	2.129156
Prob(F-statistic)	0.000000		

Inverted AR Roots 1.07
Estimated AR process is nonstationary

Appendix 71 - OLS Estimation for Moderating Effects of FDI on Income Inequality

Dependent Variable: ZGDP
Method: Least Squares
Date: 11/28/12 Time: 00:30
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments
Convergence achieved after 80 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	676.5334	179356.1	0.003772	0.9970
ZGINI	0.031240	0.133345	0.234278	0.8161
ZFDI	0.155193	0.073725	2.105013	0.0423
ZGINI*ZFDI	-0.060970	0.081158	-0.751258	0.4574
AR(1)	0.999875	0.033223	30.09547	0.0000

R-squared	0.973229	Mean dependent var	0.029472
Adjusted R-squared	0.970254	S.D. dependent var	0.993784
S.E. of regression	0.171398	Akaike info criterion	-0.575802
Sum squared resid	1.057587	Schwarz criterion	-0.366830
Log likelihood	16.80395	Hannan-Quinn criter.	-0.499706
F-statistic	327.1786	Durbin-Watson stat	1.535736
Prob(F-statistic)	0.000000		

Inverted AR Roots	1.00

Appendix 72 - OLS Estimation for Moderating Effects of Trade on Income Inequality

Dependent Variable: ZGDP
Method: Least Squares
Date: 12/20/12 Time: 20:56
Sample (adjusted): 1971 2011
Included observations: 41 after adjustments
Convergence achieved after 10 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.953938	1.455931	-1.342054	0.1880
ZGINI	0.044422	0.163387	0.271881	0.7873
ZNT	-0.081182	0.145422	-0.558249	0.5801
ZGINI*ZNT	-0.151925	0.147567	-1.029532	0.3101
AR(1)	1.055793	0.038859	27.16971	0.0000

R-squared	0.953574	Mean dependent var	0.029472
Adjusted R-squared	0.948415	S.D. dependent var	0.993784
S.E. of regression	0.225711	Akaike info criterion	-0.025273
Sum squared resid	1.834037	Schwarz criterion	0.183699
Log likelihood	5.518096	Hannan-Quinn criter.	0.050823
F-statistic	184.8555	Durbin-Watson stat	2.111671
Prob(F-statistic)	0.000000		

Inverted AR Roots 1.06
Estimated AR process is nonstationary

Appendix 73A – Data Spread 1

Year	GDP (constant 2005 US$)	GINI Index (log-linear interpolated)	FDI (constant 2005 US$)	Net Trade (constant 2005 US$)
1970	17583237232	0.513000	386475020	855848767
1971	17678947495	0.517198	391618004	2426499877
1972	20142835693	0.521431	428063020	4118444008
1973	28998547020	0.525698	611942160	5007102454
1974	32944898986	0.530000	1861779686	-279131452
1975	29468201636	0.543332	1044284156	-486668778
1976	33127786337	0.557000	1074591214	2950967205
1977	37030740631	0.539097	1075488570	2603134497
1978	41248377803	0.521770	1238048905	2201332206
1979	49372257213	0.505000	1310644179	4209726443
1980	52229480867	0.500521	1956018431	1197856836
1981	48761086896	0.496082	2421846779	-3169843383
1982	49253342840	0.491683	2521939511	-4370691982
1983	53274743111	0.487322	2188679295	-2908265585
1984	57844890446	0.483000	1334553115	1019658560
1985	51594213089	0.473827	1128127518	2567552831
1986	44860259791	0.464828	776508856	2574416050
1987	49661132050	0.456000	652257517	6884532155
1988	52598090452	0.448945	1072809659	5368603749
1989	55830039186	0.442000	2396931079	3385837571
1990	60956201205	0.447596	3229534758	1245948264
1991	65795138148	0.453262	5354322167	-2408860655
1992	77575491828	0.459000	6797849385	1053862291
1993	85848335107	0.457998	6423942427	-86749397
1994	93676935648	0.456998	5460823691	-1452673039
1995	109187266763	0.456000	5135629153	-4280672542
1996	121803859926	0.457498	6133461534	1704139348
1997	118690955241	0.459000	6086301629	1114066976
1998	84336367055	0.450929	2527920543	18573218800
1999	91147906208	0.443000	4485813699	22834343365
2000	105721427108	0.448921	4269484374	20312191305
2001	102269145166	0.454920	610576780	17835803426
2002	109378667912	0.461000	3474481619	17966920355
2003	117061383389	0.461500	2627087681	23110684328
2004	128890236699	0.462000	4777700231	26258305182
2005	137952929781	0.454891	3966012726	30775516791

Year	GDP (constant 2005 US$)	GINI Index (log-linear interpolated)	FDI (constant 2005 US$)	Net Trade (constant 2005 US$)
2006	151707371485	0.447892	5886231240	34363166203
2007	175842301297	0.441000	8087269050	36265262618
2008	205166615790	0.441000	6793846532	47263406099
2009	175818477257	0.441000	1264462092	37869301336
2010	214257701360	0.441000	8259752284	38036491323
2011	244410279177	0.441000	9454214514	40451559846

Appendix 73B – Data Spread 2

Year	Domestic Credit Provided by Banking Sector (as a percentage of GDP)	Domestic Credit to Private Sector (as a percentage of GDP)	M2 Monetary Aggregate (as a percentage of GDP)
1970	21.79010	19.23352	36.95922
1971	24.44861	21.21328	40.15501
1972	28.43175	22.78956	44.90080
1973	31.53720	26.12659	45.05996
1974	47.29210	26.54584	56.26643
1975	57.34215	32.26330	66.96295
1976	52.94601	31.94870	67.04876
1977	55.80662	33.68108	67.43542
1978	60.38049	38.48714	71.93653
1979	57.75371	40.73063	72.54856
1980	68.22270	49.01074	79.18954
1981	80.23861	56.72140	87.81718
1982	89.33275	61.62306	94.06604
1983	96.20766	69.16165	98.06562
1984	101.68609	73.54177	100.26624
1985	116.46652	86.58700	113.06307
1986	138.84079	99.63907	138.22713
1987	133.69008	89.57662	127.02670
1988	129.51196	86.46249	121.07946
1989	136.21127	95.65289	129.48182
1990	72.67381	69.41267	64.37710

Year	Domestic Credit Provided by Banking Sector (as a percentage of GDP)	Domestic Credit to Private Sector (as a percentage of GDP)	M2 Monetary Aggregate (as a percentage of GDP)
1991	75.10986	73.76109	66.30929
1992	114.61097	108.52923	102.22303
1993	112.50457	106.46042	113.03496
1994	112.21800	109.21774	111.03954
1995	126.70691	124.41472	115.63037
1996	142.42331	141.63318	120.12478
1997	163.35453	158.38505	125.50687
1998	162.12719	158.50539	125.15190
1999	150.10577	149.15298	132.12104
2000	138.37217	134.99985	122.69875
2001	146.53130	129.10138	138.46070
2002	143.64128	121.82734	133.10447
2003	139.84795	118.97415	132.31127
2004	127.48360	111.93761	131.71137
2005	122.41484	110.83337	130.01894
2006	119.03284	107.69586	134.36886
2007	113.39751	105.26500	129.74423
2008	114.95098	100.32888	124.01624
2009	137.39851	117.01030	145.90328
2010	132.21975	114.88035	139.03323
2011	132.05785	115.92765	143.13296