Tax Havens and Their Impact on Unemployment

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Abstract-The research investigates and evaluates the role of tax haven economies in generating unemployment in an economy. The study adopts a 30-year sample size of four economies from 1986 to 2016. The economies employed in the study are; Singapore and Switzerland which are tax haven economies, and UK and US which are non-tax haven economies. RGDP, FDI, Total Investments and Total Revenue are used as macroeconomic indicators to distinguish a tax haven and not- tax haven economies. The ARDL Bounds Testing and ARDL Long-run Form has been utilised to empirically test this argument, whether a significant relationship exists and whether a short or long–run interaction is present between these economic indicators. The outcome from the empirical estimations suggests a short and long-run relationship between all the variables employed, thus with the Singapore and Switzerland results being valid and statistically significant, contrary to the outcome obtained on UK and US economies which show insignificant results despite showing both short and long-run relationship amongst the variables. The analyses done on the Singapore and Switzerland data show a negative relationship existing between unemployment, RGDP and total investments, a negative relationship between unemployment and FDI for the Singapore economy while showing a positive correlation between FDI and unemployment in Switzerland. For Singapore, the results indicate a positive relationship between unemployment and total revenue, while showing a negative correlation in Switzerland. These suggest a rise in the level of RGDP, and total investment will yield a decline in unemployment rate in the Singapore and Switzerland economies; an increase in FDI will reduce unemployment in Singapore while increasing unemployment in Switzerland. Furthermore, an increase in total revenue increases unemployment in Singapore and reduces unemployment in Switzerland. Nevertheless, the results on UK and US are statistically insignificant and invalid, thus leading to the conclusion that the empirical pieces of evidence obtained are inconclusive, and that the model adopted for both economies are incompatible.

1.INTRODUCTION

1.1 Background

It is an exciting time to research on tax havens. Tax havens have become a topic of much attention and debate. Since the 1980's, the start of globalisation, we have seen a growth in the number of tax havens across the world. Globalization, in recent years, has brought up new issues. Companies and capital are now more mobile, and governments have had to deal with this new dimension by taking it into account when formulating tax policies. The gradual removal of barriers to the movement of capital has led countries to compete using tax policies for global FDI.

Tax havens are low tax jurisdictions which offer tax breaks or very low taxes to corporations and individuals (Nicodème 2009). Its been used as a measure or a tool for tax avoidance practices by firms or individuals and has been said to result in fierce tax competitions between countries for foreign direct investments (See Stiglitz: 2013, Palan et al.: 2006). This has led to concerns of a possible race to the bottom (Christensen et al.: 2014). Since the late 1990's international organisations like the OECD have campaigned aggressively against harmful tax havens (OECD 1998, 2000).

Discussions on tax havens are based on the belief that tax incentives offered by countries heavily affect the behaviour of MNE (Commission of the European Communities, 2001). There is sufficient economic literature which tends to support this claim (See CEC, 1992). A summary of the early research on this suggests that the tax rate offered by countries to MNE have a significant effect on the inflow of FDI. The ability of tax havens to attract FDI through lower tax rates is an attempt to attract a higher inflow of FDI which will result in a greater level of economic growth, leading to a reduction in unemployment for the residents of the region through the introduction of new technologies (Desai et al. 2006).

Some studies have highlighted that tax havens existence can be beneficial to high tax countries (see Johannesen 2010; Hong and Smart 2010), whereas other papers have argued the opposite (e.g.,Haufler and Runkel 2012 and Slemrod and Wilson 2009). All together this goes to confirm that the activities of tax havens have come into prominence, they are at a stage where they play more than just a marginal role in shaping economic growth and development around the globe. When viewed as Individually, they appear to be small but in grouping play a preeminent role in the world market. A huge number of MNE have moved their activities to low-tax countries to reduce their tax obligation.

Over two million international businesses are said to reside in tax havens, and 30% of all foreign direct investment and above 50% of international banking lending are recorded in these economies. On average the population of a low tax jurisdiction is 116000 without two countries, Panama and Liberia. The rationale behind why investors find tax havens appealing is not difficult to comprehend, tax havens make it possible for investors to hold on to most or all the profit they make in their jurisdictions. Tax havens are said to have developed different policies in a move to attract a larger volume of FDI at the cost of high tax countries. Hines best captured this rising sensation by concluding, "Other considerations being equal. Therefore, countries with lower tax rates should be expected to offer a broader range of attractive investment opportunities, and, therefore, draw larger volumes of foreign investment, than do otherwise similar countries with higher tax rates."

At the heart of tax havens is its confidentiality characteristic, this has led to the labelling of tax havens as "secrecy havens" (Hampton:1996). Take for instance, it is a criminal offence for a financial service provider to disclose the information of a customer online in other countries like the UK where all banks are required by law to report to HM Revenue & Customs interest earned on accounts maintained by them on an annual basis. Due to the secrecy in tax havens, figures on facts and taxes are hard to obtain and what is mostly available are estimates. In some countries, secrecy is so deeply entrenched, that for something to be done about it, there must be a constitutional change.

1.2 Justification and purpose of study

Tax havens play a significant role in the global economy, and there have been little empirical studies on the activities of tax havens, the primary motivation for this research is to contribute more to the tax haven literature and fill a gap of the research gap. The main purpose of this study is to examine how being a designated tax haven impacts the rate of unemployment in tax havens and non-tax haven countries. For this reason, an empirical study is employed for four countries, two tax havens and two non-haven countries are used for this purpose. The empirical analysis starts with the use of unit root test for stationary to get the trend of the data then later conduct ARDL bound testing to ascertain the short run and long run relationships.

1.3 Ethical consideration

The study will adopt the secondary approach of the data analysis. This will include the use of time series data obtained from the World Band database and the International Monetary Fund (IMF). Materials employed will be sourced from academic journals, published works, online articles and the research will ensure that the materials used are appropriately cited and referenced consistently with the Harvard referencing style. Also, the data sourced for the empirical study will not be manipulated or misrepresented.

1.4 Research structure

The research compromises of 5 chapters. Chapter 2 reviews the foundation of the concept of tax havens and a section on foreign direct investment. After covering tax havens and their role in exacerbating tax competition, this chapter will then review the role of tax havens in attracting FDI and then move on to review the existing literature on how FDI can affect unemployment. The section entails both theoretical and empirical studies done on. Rhe chapter aims to create a link between tax havens and unemployment. The chapter ends with a conclusion on how the study intends to fill gaps missing in the tax haven literature.

Chapter 3 entails the explanation of the methodology used for the study, with an overview of the source and definition of data and method of data analysis employed.

Chapter 4 provides the findings and empirical justification of the statistical technique estimates in the research.

Chapter 5 provides a summary of the research, a conclusion based on the findings in chapter 4, policy implications, and recommendations for further research

2 LITERATURE REVIEW

2.1. Introduction

Tax havens have come into the arena of public debate in the past few years. There has been a surge in the number of individuals and MNE who have moved their activities to regions or Islands which offer little tax rates in an attempt to reduce their tax obligations. Given that tax havens now play a major role in shaping development across the globe, it has resulted in significant differences in opinion between economists and policy advisers with some arguing that tax havens have a parasitic effect on the economies on non-tax haven countries through their effect on tax competition for FDI. On the other hand, other economists have pointed out that tax competition is, in fact, good for individuals and businesses. Other avenues on how tax havens are parasitic on the economies of other countries include aiding tax avoidance practices. MNE's are said to take advantage of tax havens and transfer pricing too is said to be the tool they used for tax avoidance purposes (Klassen et al.).

Tax haven countries are recipients of a huge volume of FDI and consequently are said to have experienced quick financial and economic development in the past three decades (Hines, 2015). Until the beginning of the 21st century, most of the literature written on the activities of tax havens have been negative. From the 1980's there was a sustained, critic of the activities of havens by organisations such as OECD and IMF (See OECD 1998, 2000 and IMF 2014). A 1998 report by OECD states that governments of countries should not stand by and watch as "their tax bases are being eroded through the actions of tax havens", which leads to a reduction in the tax revenue which they use to provide public goods. This was followed by a paper two years later in which the organisation termed some 35 countries as "non-cooperating tax havens" (OECD:2000). In contrast to the negative impact of tax havens, recent economic papers have focused on the potentially active role tax havens have had in increasing efficiency through tax competition.

This chapter begins with a review of the current literature on tax havens and the effect of tax competition for FDI. Section 2. Will discuss the literature which discusses foreign direct investments, and how it can influence unemployment.

2.1.1 Theoretical Framework

Two significant conclusions can be drawn from the literature. Firstly, from the theoretical perspective the effect of tax havens on high tax countries is ambiguous.

Slemrod and Wilson (2006) theoretically modelled this orthodox viewpoint on tax havens. Slemrod and Wilson (2006) postulate that tax havens are parasitic on non-tax haven countries and are the main reason for some of the most radical tax laws around the world. In the model developed by Slemrod and Wilson (2006), tax havens are said to have a parasitic effect on non-haven economies. Firms in non-haven countries according to the model can choose to purchase "concealment services" from tax havens, and a consequence avoid the paying of taxes to the countries they are based. This induces non-havens to spend additional resources on enforcing tax compliance. Their model shows tax havens as intensifying tax competition, and they set in motion the setting of lower taxes by non-havens than they otherwise would, thereby leading to fewer tax revenues and subsequently a reduction in the reduction of public goods by the governments. These welfare losses can be eliminated from the model through the removal of tax havens from the model (Dharmapala, 2008). Tax havens offer not only low rates of taxation, but they are also very likely to provide an investment friendly environment to attract foreign capital and investments. The model also suggests that the existence of tax havens in a location will influence where MNE decide to invest. This redirection of FDI may be relatively more harmful to high-tax countries, Schmidt-Eisenlohr and Krautheim (2011), also support this pessimistic view.

Chu et al. (2014), also, pointed out that due to the existence of tax havens, governments of high tax economies must corporate amongst themselves to restrict MNE from engaging in tax planning activities, which will lead to loss of social welfare in these countries. Piccard and Pieretti (2010) state that due to the secrecy in tax havens, they thrive due to their ability to attract money launders and cheaters. In their paper, they argue that it is impossible to solve financial crime in such regions due to the way banks in tax havens behave neutrally towards their potential clients. Schwarz (2010) in a study shows that there is a very high chance that a tax haven will be involved in money laundering activities. Classifying tax havens according to their GDP per capita, Schwarz (2010) finds that poorer tax havens tend to supply this service because the gains from lower taxes offered are little compared to richer havens, and they are reluctant to provide the necessary regulatory environment to check money laundering. There is a fear that the confidential accounts in banking and corporate sectors offered by tax havens could enable criminal activities, including, drug-related offences and crimes by terrorist This may impede the well-ordered regulation, diminish the transparency and thereby the operation of financial and legal systems around the globe.

Also, Hong and Smart (2010) postulate that tax havens might lead to a rise in tax planning activities by MNE which might lead to an exertion of pressure on the political class to reduce the tax rate, which they suggest will result in the reduction in a "sub-optimally low tax rate below the efficient level".

Nonetheless, whether the existence of tax havens is unfavourable to high-tax countries becomes more debatable because an emergent number of studies postulate that there are certain channels where tax havens can be "beneficial". According to Honohan and Walsh (2002), being a designated tax haven will lead to improved economic growth due to higher inflow of FDI into the entity through the spillover of technical know-how and knowledge into the economy by foreign firms. According to Dyreng and Lindsey (2009), tax havens have helped to increase the global supply of capital which is to the benefit of all countries. This is because they have policies which have enabled MNC to reduce significantly capital costs by increasing their investment in these regions.

Hines (1997), postulates that being a tax haven increases unemployment in countries which increase political stability, he used Ireland to further his argument. Ireland has a mere corporate tax rate, which was specifically designed to attract FDI, Ireland has had a lower level of unemployment as a result about half of manufacturing jobs are in businesses owned by foreign investors. Honohan and Walsh (2002), state that being a designated tax haven will improve economic growth in the country. They drew from Ireland's experience linking the exceptional performance of Ireland's economy to a combination of factors, comprising of, investment in human capital, macroeconomic policy reforms, market changes, and most importantly, tax policies.

2.2.2 Views on Tax Competition for FDI

"Countries are now engaged increasingly in different competitive: they are competing for world market shares as the surest means to greater wealth and greater economic security" (Susan Strange 1988)

The first mention of tax competition can be traced to Bradford and Oates (1971) and Oates (1972). The earlier works done on this topic did not include formalised models, but the positive effect of fiscal externalities on the provision of public goods. The universal agreement then was tax competition leads to an under provision of public goods. This conclusion hinged on two thoughts. The first is that there is only one source of government revenues through taxation and the second, in the absence of tax competition, the government would provide the efficient level of public goods. The under provision of public goods is indeed a testable hypothesis, but it also requires the knowledge of what the optimal level of public goods is (Devereux and Loretz: 2012).

Wilson (1986), Zobrrow and Mieszoksi (1986) and Wilson (1986) formulated a model for tax competition. Their models describe a situation where small open economies levy a tax on mobile factors. As a result of the perfect mobility of capital, each nation will take the world rate of return and tax rates will compete to zero. This implies the famous race to the bottom theory with taxes set at zero. These models can seem as imitating the Bertrand competition model with a high number of players each a price taker. The main assumptions are a great many countries and the mobility of capital. This then implies that even an increase in tax rates by a marginal amount will lead to capital flight.

Gordon (1992) built on these two models and allows for the sequential setting of tax rates using a Stackelberg, competition model. In this model, a large country taxes the world wide earnings of its companies, while giving a tax credit for taxes already paid in foreign countries. Taxation of foreign income reduces the incentive for tax havens to set tax rates lower than the level which would have been set without the world wide taxing of foreign income. This allows large countries to set positive tax rates. Haufler and Wooton (1999) modelled a game between two countries and a monopolist; they conclude that a large country can maintain positive tax rates. In the case of asymmetric countries, there will be an inevitable race to the bottom. On the contrary Ferret and Wotton (2010) show that if there are two companies in the industry both countries can maintain a positive tax rate. Hines (2006), Postulates that tax competition between countries may also have an after effect in which capital taxes are greater than they otherwise would have been. This can transpire when productive factors of production are owned by foreigners or when is an attempt by various governments to tax the same income sources.

Supporters of tax competition argue that tax havens serve as alternatives to high tax high spending nations. Mitchell (2009) postulates that competition in tax rates by countries around the world has helped in promoting better tax policies around the world today. He further states that "the ability to choose an area of financial activity for an individual or corporations balances weaknesses in government planning procedures, restricting a propensity to tax and overspend".

Tax competition has been said to extend the idea of neo classical economists of a free market competition. An argument against this view is that since countries do not compete with one another in providing services and infrastructure to their citizenry, then they should not compete on the tax they levy on those residing in their jurisdiction. Joseph Stiglitz (2012) has stated that tax competition between countries is a zero-sum game. He suggests that tax competition will lead to a race to the bottom. This point of view is equally shared by Christensen et al. (2004), they argue that the long-term impact of the downward trend in tax rates for corporations gives a voice to the concerns of academics of countries being absorbed in a possible race to the bottom regarding tax affairs.

About tax competition as a tool for attracting FDI, amongst which were works of David G. Hartman (1982) Haufler (2001) and Andreas Haufler and Ian Wooton (1999). They created a simple two-country model with asymmetric market sizes using two potential host countries competing to attract a foreign-owned monopolist. These studies established that the foreign monopolist desires to be in a country with a positive tax rate when the host country has a larger market. Also, Considering the relevance of FDI attraction, the fundamental determinants are market size, availability of skilled labour and access to raw materials, whereas the fiscal environment is secondary according to The United Nations Conference on Trade and Development (2012) Yasuo Sanjo (2012) analyses the significance of different sizes for countries, the corporate tax rate in attracting FDI and risk attached to a country. He constructs a tax competition model with two countries that are different in their risks and resolves that assuming there exists the same level of risks in both economies investors can overlook the higher risk investments because the bigger size of the of economy. Accoridng to his model, the size of the market is a stronger determinant for attracting FDI than tax incentives which the smaller economy might offer. Gersovitz (1987) and Alworth (1988) also provided models which concluded that FDI is affected by both the tax systems of the MNEs host and home country. Accordingly, the inducements regarding FDI are affected by the tax policies of both the potential host countries and MNE home country. Some theoretical treatment of these questions is provided by Gersovitz (1987) and Alworth (1988).

According to Christensen et al. (2004), "The long-term downward trend in the corporate income tax rates of the OECD countries supports the widespread concern about States being engaged in a race to the bottom in their tax affairs." The thesis on the race to the bottom forecasts the deregulation of tax regimes or business environments under the pressure of international tax competition; this has led to economists debating if indeed tax havens play any role in this. Palan et al. (2006) argue that, the development of different tax policies by nations should not be mistaken with a race to the bottom, they state that MNEs do look at tax rates in countries when deciding where to set up their business to a fault, but they also look at other factors which are as important or more important than the tax rate of the country. Countries attract business by ensuring there is little or no political instability and availability of a highly skilled labour force and logistics (Palan et al.,2006 and Chavagneux, 2006). Internationally respectable MNEs do not want to do business with tax havens which are viewed negatively around the world as that will lead to a negative painting of their organisation which will affect the image of the corporation. "There is a premium for those tax havens with a reputation for solidity and, at least, the appearance of a regulatory environment" (Chavagneux, 2006). Some of the tax havens with the least regulations and tax rates are some of the least successful, take for instance the Pacific atolls due to their negative image (Sharman 2006).

2.1.3 Review of Empirical Literature on Tax havens

Hines (2010) examined if tax havens grow at a faster rate relative to non-tax havens and if tax havens have positive spillover effects on countries near them. The result of his analysis showed that tax havens averaged an annual growth of 2.85 percent higher than other nations. The world growth rate according to the research was at 2.43 percent, while that of G7 nations was at 1.75%, Non-OECD countries with the exclusion of China 2.17% OECD 2.26%, Non-havens 2.39%, and countries close to tax havens grew at 2.56%. Categorised in order of "Distance," the distance of the median country in the world from the nearest tax haven is 825 kilometres, so those located closer than 825 kilometres from the nearest tax haven are designated "close," others "far." His results showed that tax havens grew faster than all other groups in his data set with countries close to tax havens growing at the second highest rate. This led to Hines' concluding that that company, when faced with a lower cost due to the subsidies offered by tax havens, respond by expanding their FDI activities in high tax countries in the vicinity. This shows that the use of tax haven activities allows MNE to increase their investments or at the minimum maintain their investments in high tax countries which would not have been the case if the costs of investing in tax havens were more costly.

This conforms with other works done on the externality of tax havens on nearby high tax countries. In an empirical paper, Dyreng and Lindsey (2009), they estimate that firms with a presence in at least one tax haven face a rate of 1.5 percentage point's lower tax rate on pre-tax income than firms with no presence in tax havens. These savings in capital costs allows MNE allows these companies to increase their FDI in non-tax havens across the globe (Desai et al., 2006a; Chantasasawat, Fung, Iizaka, & Siu, 2010 Hong & Smart, 2010).)

Also, Blanco and Rogers (2013) investigate in a paper the impact of tax havens on tax havens countries regarding FDI. The analysis captured the effects by incorporating geographical spillover, and FDI inflows into tax havens. Their study provided interesting results which highlighted that tax havens have positive spillover effects in developing countries in close proximities but not developed countries. Restricting their research to developing countries, they find the effect on the developing countries to be robust.

Thirdly, they found enough evidence to suggest that geographical distance is critical for capital inflow. These findings are in contrast to the model of Slemrod and Wilson (2006), in which their model tried to explain how tax havens have negative effects on the economies of other countries.

Devereux et al. (2002) calculate that the emergence of tax havens has led to a decrease in corporate tax rates around the world in the last three decades by over 15%, between 1995 and 2007 this fell from 35% on average to 25%, a decline of 10 points. The role of the tax haven in exacerbating reduction of corporate tax rate was also confirmed by Swank (2006), he undertook a study of 25 countries and looked at how the reduction in the tax rates of 16 countries in his sample affected the other 9. This allowed him to reveal that the decrease in tax rates in the 16 countries in his sample led to a decline in the tax rates of other countries in the sample.

The thesis on the race to the bottom is not supported with factual evidence according to Norregaard and Khan (2007). Citing the fact that although in the past three decades there has been a reduction in corporate tax rates around the world, corporate tax receipts as a percentage of GDP have also increased over the said period. The explanation given is tax cuts for companies were accompanied with the widening of the tax base through generous deductions and the scaling of exemptions and (Norregaard and Khan: 2007).

2.2. Foreign Direct Investment

There is a vast amount of literature on numerous theoretical views on capital mobility between countries. There are different reasons as to why investors move abroad. In this section of the research, I would explain the theory of FDI, which relates to tax haven and this article will also discuss avenues on how FDI affects unemployment. This section will involve both theoretical and empirical evidence.

2.2.1Theories of FDI

The theory of FDI which relates to tax havens is the theory of market distortion. The theory is grounded on the notion that governments have a portfolio of tools with which they can attract FDI into their country. According to the theory, this creates an uneven playing field in the market, and it can result to discrimination against domestic investors. The most common type is the type of public support. The receipt of support from the system of incentive investments which is limited by a certain threshold of investment (the amount investment). Investors who do not reach this limit are at a disadvantage relative to those who can. Usually, foreign investors, unlike domestic investors, can invest an enormous amount of capital. This gives them the advantage when it comes to reaching incentives relative to domestic investors who are paying high taxes to their local governments.

2.2.2 Foreign Direct Investment and Growth

Academics and policymakers have postulated that FDI can have many positive impacts on host economies. The position ranges from pessimism to an unreserved optimism based entirely on the neoclassical theory of the new economic growth theory. Besides the direct injection of capital, FDI is said to increase economic growth through stimulating technological change through the adoption of foreign knowledge and technology. According to Alfaro (2003) based on these debates, countries have made a lot of effort to attract FDI to their economies (Alfaro, 2003).

Lately, the advantageous role of FDI and incentives given by host countries have begun to be questioned. The discussion around the notion that FDI generates positive spillovers for host economies is uncertain. Hanson (2001) and many pieces of research have argued that there is feeble evidence to support the notion that FDI generates a positive effect on economies. Some like Gorg and Greenwood (2002), go as far to argue that FDI has a negative impact on host economies. Other studies have pointed out that there is no relationship between FDI and economic growth, one of those is Lipsey (2002). He argues there is a need to consider other conditions which might influence or restrict spillovers.

The major issue is the difficulty in determining in which sector there is a positive spillover of FDI on the economy as such positives can vary across different industries. In a World Investment Report UNCTAD (2001), Says that there is an insufficient relationship between local investors and foreign investors in the input material sector. The relationship is much stronger in industries where there are a lot of interactive activities. In the industrial sector, suppliers and investors are connected and have similar targets. In the service industry, production is divided into different stages and subcontracting stages (Alfaro, 2003).

Most of the papers written concentrate on the role of FDI in the import sectors (i.e. the industrial and services sector) of the economy. The most acknowledged benefit in these sectors of the economy are, the introduction of new technology, new management skills and labour training De Mello (1999). Wang and Bloomstrom (1992) and Findlay (1978) supported the notion, in their work, they modelled the role of FDI as a canal of transferring technological knowledge to critical sectors of the economy than the primary industries. Also, Noorzoy (1979) postulates that FDI can help countries overcome the shortage of capital and serve as complimentary of domestic investment in high-risk countries or industries in which local investments are scarce.

However, a theory which emphases the role of FDI in driving economic growth is the endogenous growth model. According to Melnyk et al. (2014), a production function which has FDI embedded in it can be presented as;

$$Y = A^{*}f\ (K, L, F, P) \qquad (2.1)$$

From the above equation (2.1), Y symbolize the output (i.e. the gross domestic product in real terms); A symbolizes technology as an exogenous factor; K denotes the physical state of capital (domestic capital stock) L denotes labour input; F represent foreign capital (FDI), while P denotes vector of ancillary (comprising of policy).

By presuming the augmented production function to be in a logarithms linear form, transforming to logarithms and estimating time derivatives of an augmented Cobb-Douglas function in specification (2.1), this can hereby result to presenting the growth rate of GDP as;

$$g_{yit} = \alpha + \alpha_1 Y_{0it} + \alpha_2 H_{it} + \alpha_3 FDI_{it} + \alpha_4 K_{it} + \alpha_5 P_{it} \qquad (2.2)$$

g_{yit} represent the logarithmic value of rate of growth of the GDP in an economy represented as y at time t; Y_{0it} represent logarithmic factor of GDP per capita in a time prior to the taking of before g_{yit}; H_{it} denotes the human capital. The model adopted the logarithmic value of growth rate of the population, duration of schooling and tertiary education; K denotes the physical capital (employing logarithmic value of investments in infrastructure); logarithmic data of growth rate of FDI is employed to determine the inflow of capital; P is a vector of policy indicators.

The coefficients $\alpha_1, \alpha_2, \alpha_3, \alpha_4\ and\ \alpha_5$ represent the output elasticity in relation to physical capital, labour, FDI and other key indicators.

However, Y_{0it} which symbolizes the existing state of GDP per capita is adopted concurrently in the endogenous growth model, in bid to identify the tendency of attaining a convergence effect. Thus, it is argued that high level of per capita income yields a slow rate of growth of the economy, that is, having the expectation of obtaining theoretically a negative coefficient in model (2.1).

However, there are other views which oppose the traditionally positive views of the relationship between economic growth and FDI. Hymer (1960) and Caves (1971), industrial organisation theory, stipulates that MNE use FDI as a tool for the advancement of monopoly power over local firms. They postulate that these firms come with certain advantages such as advanced technologies, economies of scale and better management skills, this could be transformed to monopoly power (Dunning 1981). Due to the tax breaks, MNE get in tax havens, this might strengthen their competitive advantage and lead to the exit of domestic firms from the industry. De Mello (1999) stated that “Whether FDI can be deemed to be a catalyst for output growth, capital accumulation and technological progress seems to be a less controversial hypothesis in theory than in practice” (1999 p. 148). Likewise, Alfaro (2003) concluded that FDI has positive effects on the industrial and services sector but a negative sector on the primary sector. He also found that FDI has little effect in mining and agriculture industry.

2.2.3 Link between Growth and Unemployment

Harrod (1939) and Domar (1947) were the first to contribute to the topic of between unemployment and economic growth. However, following the emergence of Solow growth model (1956), their work became isolated in the field of economics as the Solow growth model began a new branch of questions which deviated attention from unemployment and growth.

The topic regained attention 40 years on, due to the model developed by Pissarides’ (1990), which has been considered as “one of the first attempts to explain the presence of unemployment in a growing economy” (Aricó, 2003, p. 423). His work established a relationship between unemployment and growth through profit and costs of hiring. Pissarides' (1990), postulates that in a steady state both profits and costs of hiring rise at the same rate, a lower (higher) growth rate has two effects: decreases (increases) future profits and decreases (increases) future hiring costs. Therefore, a firm facing a potential increase in the rate of growth will be faced with more hiring today to save future hiring costs. Put another way; a higher growth rate implies a lower unemployment rate and hence a higher rate of job vacancies. This is known as the capitalisation effect according to Aghion and Howitt (1994). In a paper, they argued another interpretation of this effect by postulating a higher impact the "effective discount rate", which is the difference between the interest rate and growth rate. An increase in the rate of growth will cause rate of return on investment to rise, leading to the emergence of new firms into the market and therefore an decrease in unemployment.

With reference to the wok of Al-Habees and Abu Rumman (2012), the Arthur Okun's theory can be adopted to evaluate and ascertain the correlation between unemployment and economic growth. The Okun's theory argues the menace of unemployment as a shortfall between the potential outcome and the actual output obtained in an economy. In view of this argument, it can be presumed that reduction in unemployment rate is depended on the growth rate of the economy which exceeds the current growth level. This is presented in the function below;

$$U = a + b\,(Y - Y^{*}) \qquad (2.3)$$

The above function (2.3) is streamlined to ascertain the natural proportion of unemployment identified by Okun with 3%. To obtain the actual or existing rate of growth *(Y*)* and fluctuations from period-to-period, the Okun model can be proposed in respect of employing dynamic analysis, presented;

$$Y + \Delta\,U = \alpha + b\,\Delta\,\phi \qquad (2.4)$$

where; $\Delta\,U$ represent the rate of fluctuations in the unemployment rate, $\Delta\,U$ denotes the rate of growth of the economy, b is the elasticity amongst unemployment and growth, while ϕ symbolizes the error term.

α and b represent the proportion of change in the natural or actual growth of unemployment in the midst of fluctuations. When the rate of unemployment is constant, i.e. $\Delta\,U = 0$, the basic internal gross grows in the actual growth rate presented as;

$$Y^{*} = -\alpha/b \qquad (2.5)$$

The above function (2.5) expresses the rate of growth required to keep the unemployment level constant, i.e. emphasises the stability of the rate. The significant effects of this model shows that the correlation between unemployment and economic growth is being identified if there is a high rate of growth. Thus, having a rise in the level of economic growth will subsequently reduce the unemployment rate in an economy as there is increase in production of goods and services, as well as increase in output. At this point, a correlation is conducted between the increase in growth rate and decline in unemployment level, and however, b in the function below symbolizes the interaction existing amongst unemployment and economic growth, and it ascertains the level of unemployment alongside any fluctuation in the unitary economic growth. This relationship is however presented as;

$$b = \Delta\,U/\Delta\,Y \qquad (2.6)$$

According to Bean and Pissarides (1993), the relationship between unemployment and growth can be in both directions, so in their model, both variables are considered to be endogenous which is in direct contradiction to Pissarides (1990). In their model, they offered the pool of savings effect as an explanation of the relationship. This states that an increase in the rate of unemployment will imply a decrease in the aggregate savings of the economy, limiting the resources available for investments leading according to the Solow (1956) model a reduction in the rate of growth. By combining frictions in the labour market and an overlapping generations endogenous growth model, Bean and Pissarides (1993) analysed using changes in marginal productivity to consume or save to analyse a set of new relations on unemployment and growth rate.

Acemoglu (1997) in another work, he attempted to describe labour supply in a growth-unemployment framework. Acemoglu built on the search and matching economic model and built on it. He introduced a possible heterogeneity, due in part to his considering of the existence of skilled and unskilled labour and firms possession or lack of new technology. In his model, the only way for a worker to be skilled or unskilled is if the worker is hired or the firm trains the worker. With low unemployment rate, firms expect to hire an unskilled worker resulting in lower incentive on the part of the firm to innovate and hire since there is a cost to training workers, that is because the cost of hiring will reduce the total profit of the firm. This according to Acemoglu (1997) will result in lower level of growth and a much higher level of unemployment, inverting this according to Acemoglu the analysis, now from growth to unemployment will produce similar results. Assuming costs of training is taking into consideration, if each company expects other firms to incorporate new technologies and innovation, none of the other firms will adopt the new technology reducing the incentive to innovate and employ workers. Leading once again to a reduction in the rate of growth and the subsequent increasing the rate of unemployment.

2.2.4 Empirical Evidence on FDI, Growth and Unemployment

Various research have been carried out in searching for the relationship between FDI, economic growth and unemployment. (e.g. Vacaflores (2011); Habees and Abu-Rumman (2012), Mpanju (2012)). The results of these empirical research vary, some confirming the existence of a positive relationship between the three, some contradicting while others arrived at inconclusive results. For example, in research by Shaari et al. (2012), the research evaluated studied the impact of FDI on the unemployment rate and economic growth in Malaysia from 1980 to 2010. Using the OLS method. His results indicate that inflow of FDI reduces the unemployment rate and increased economic growth. A 1 % increase in FDI will lead to a decrease in unemployment by 0.009% and a 1.219% increase in the GDP. Their results indicate that FDI does lead to growth in jobs and a stronger economic growth.

Another study which found a positive impact of FDI is research conducted by Vacaflores (2011) which focused on 12 Latin American countries from 1980-2006. The results indicate that FDI has a positive and significant impact on unemployment in the group of countries with the specific impact of an increase in male labour force. The results also showed that FDI has a more positive impact on developing countries with the significantly low level of inflation. This means that countries with low inflows of FDI and a high level of informality harvest the Latin American countries from 1980-2006. benefit. Furthermore, Palat (2011) shows that compared to other developed countries in a study done in Japan, it had lower levels of inflow of FDI relative to other developed countries. The unemployment level in Japan was relatively low which Palat (2011) concludes could be traced to the attitude of the populace of Japan towards unemployment. The study indicates the existence of a correlation between unemployment and FDI. Also In another study, Balcerzak and Żurek (2011) econometrically studied the influence of FDI on labour markets in Poland. They used VAR methodology based on the quarterly data from 1995-2009. The results their study proved that there exist interdependencies between unemployment and FDI. They concluded that the inflow of FDI inversely affects the rate of unemployment. What was more astonishing was this relationship only exists in the short term. They suggested that policies which are created to attract FDI should be reformed to make conditions possible for positive long term influence.

Nicu (2011) also shows that the inflow of FDI can lead to job creation and its capable of accessing modern technologies resulting in positive spillovers on the economy. The study also finds FDI to be a catalyst for economic growth with the study revealing a direct link between FDI and GDP and an inverse relationship between unemployment rate and FDI. Correspondingly a study by Mpanju (2012) analysed the effect of the inflow of FDI on unemployment creation in Tanzania from 1990-2008. The study indicates that there exists a strong positive relationship between FDI inflows and a decrease in the rate of unemployment.

However, there are other studies affirming the positive relationship between the variables to some extent, but not in its entirety. For instance, Habees and Abu-Rumman (2012), regarding unemployment and economic growth in Arab countries, their results proved that is recommended to pursue pro-growth and reduction of unemployment rate separately, the study highlighted that unemployment is dependent on investments, while growth is dependent on government spending. Also, Velnampy et al. (2013) found that FDI does not have any significant impact on economic growth. In contradiction, their results indicated there is a long run relationship between FDI and rate of economic growth. Also, there is a significant relationship between economic growth and unemployment. However, there is no long-term relationship between unemployment and economic growth. In the context of FDI and unemployment, FDI is found to have no significant impact in the short run, but the relationship is significant in the long run.

On the other hand, several pieces of research done have contradicted this view. For instance, recent research by Hisarciklilar et al. (2010) explains Using a sample belonging to 19 sectors from 2000-2007 how FDI inflows might have an impact on the rate of unemployment in Turkey. The research expressed that there exists a negative relationship between the inflow of FDI and unemployment. He then considered unemployment as a function of lagged unemployment; real wages lagged values of FDI inflows. Results suggest that FDI inflows still have a negative impact on the unemployment rate. Furthermore, regarding unemployment and economic growth, Jayaraman and Singh (2007) examined the link between unemployment FDI and GDP for Fiji with data ranging from 1970-2003. The result illustrates the existence of a long run one direction relationship between FDI and a lower rate of unemployment with direction from FDI to unemployment. In addition to a short run relationship between FDI and GDP with direction from FDI to GDP

2.3 Conclusion

The review of the literature has shown that tax havens can have an impact on the rate of unemployment although the direction of the impact is not clear. The channels through which tax havens influence the level of unemployment include foreign direct investment and economic growth. Prior studies have not looked at the direct effect of tax havens on unemployment, as the focus of earlier studies were restricted to how it impacts on economic growth and its effects on higher tax countries. The study by Hines provides the first insight into this topic, but more research is needed to get a better empirical and theoretical understanding on this.

Economies which are tax havens see it as an avenue to foster economic growth and subsequent economic development. The current evidence so far shows that other things are ranked more importantly by MNE when they choose where to move their investments to and unless these economies improve in those aspects, they will find it extremely difficult to attract FDI to their economies. The argument for tax havens includes those who suggest that without setting low tax rates for MNE, these countries will be unable to attract FDI because of the advantages of earlier development by of more advanced countries. While existing studies have looked at the role of tax havens extensively, no empirical study has examined how tax havens can impact on the rate of unemployment in both tax haven and non-haven countries.

3.DATA AND METHODOLOGY

3.1 Introduction

This chapter gives an overview of the economies adopted in the research, and expresses the statistical techniques to be employed in the research. The chapter as well gives the ways in which the data used in the project are ascertained. This segment of the study also analyses the pros and cons of the statistical techniques employed in other to empirically justify the arguments of the research.

The research is embarking on ascertaining the impacts of tax havens policies on unemployment. Considering the fundamental factor that there are several phenomena and benchmarking tools used in analysing and evaluating the possibility of having a tax haven economy, the research employs the models proposed and adopted by Chu, Lai and Cheng (2015); Jayaraman and Choong (2010); Dharmapala and Hines (2009); and Desai, Foley and Hines (2004) in determining a tax haven economy and adopts the variables used by the researches in ascertaining the effects tax haven regime has on the economy.

However, in testing and justifying the arguments of the research, the researcher employs a secondary technique of data analysis involving the utilization of time series data of two tax haven economies namely; Singapore and Switzerland and two non-tax haven economies namely; United Kingdom and United States of America and from 1983 to 2016 using macroeconomic data of these economies which are; Unemployment rate, Real Gross Domestic Product (RGDP), Foreign Direct Investment as a percentage of GDP, Total Investments as a percentage of GDP and General Government Revenue as a percentage of GDP.

3.2 Data sources

As mentioned, the research is adopting the secondary technique of research and adopts the time series data analysis to carry out the study. The research is using a sample of 30 years of the macroeconomic variables adopted to carry out the study. The data used is sourced from the World Bank Statistical database, Organization for Economic Co-operation and Development (OECD) database and IMF World Economic Outlook (see Stats.oecd.org, 2017; Imf.org, 2017; and Data.worldbank.org, 2017). The variables to be adopted for all the four economies are explained below;

Table 1.1: Macroeconomic Variables Adopted in the Study

Variables	Description	Source
$UNEM_t$	The $UNEM_t$ denotes the unemployment rate which symbolizes the rate of persistence of unemployment which is determined as a proportion by ascertaining the amount of out of job labor divided by current labor force.	World Bank Statistical database, OECD database and World Economic Outlook (WEO) data, IMF (Data.worldbank.org, 2017; Stats.oecd.org, 2017; and Imf.org, 2017).
$RGDP_t$	$RGDP_t$ denotes the Real Gross Domestic Product which is a macroeconomic variable for determining economic output adjusted for deviation in price (that is; deflation or inflation).	World Bank Statistical database, OECD database and World Economic Outlook (WEO) data, IMF (Data.worldbank.org, 2017; Stats.oecd.org, 2017; and Imf.org, 2017).
FDI_t	FDI_t denotes Foreign Direct Investment which is the net flows of direct investments into the economy by foreign investors.	World Bank Statistical database, OECD database and World Economic Outlook (WEO) data, IMF (Data.worldbank.org, 2017; Stats.oecd.org, 2017; and Imf.org, 2017).
INV_t	INV_t which represents the Total Investment as a percentage of GDP is ascertained in market prices. This variable is the gross capital formation of an economy in relation to the GDP.	World Bank Statistical database, OECD database and World Economic Outlook (WEO) data, IMF (Data.worldbank.org, 2017; Stats.oecd.org, 2017; and Imf.org, 2017).
REV_t	The indicator REV_t representing the General Government Revenue as a percentage of GDP is the total amount of money generated by the government over a period.	World Bank Statistical database, OECD database and World Economic Outlook (WEO) data, IMF (Data.worldbank.org, 2017; Stats.oecd.org, 2017; and Imf.org, 2017).

The data set ranges from 1986-2016, for four countries including two tax havens and two non-haven countries. The tax haven countries include Switzerland and Singapore whilst the non-tax haven countries are the United States and United Kingdom. The factors which contributed behind the selection of these four are: The United States and the United Kingdom have the highest number of MNE with activities in tax haven regions. Over 73 percent of MNE which operate in the US and UK countries have investments in tax havens according to Hines (2005). The rationale for selecting Singapore and Switzerland for our tax haven countries are due to the amount of investments in these countries by MNE and the size of the economies. Only seven tax havens have a population exceeding one million Including Switzerland and Singapore. These economies constitute 89% of tax haven GDP (Hines, 2006). The logic behind choosing these two economies is because they both attract more FDI compared to the other 5 large tax havens.

3.3 Research Hypotheses

The analysis of the current literature on tax havens suggests that there should exist a positive relationship between tax havens and FDI which should result in an increase in unemployment opportunities. The researcher postulates that there should exist a positive correlation between being a tax haven and unemployment opportunities and expect a negative relationship between being a high tax non-haven country and unemployment. The hypotheses below should allow us to test this postulation in Singapore, Switzerland, UK and the US. The hypotheses below will allow us to test this postulation in the research.

3.3.1 Hypotheses

H0: Being a tax haven has no impact on unemployment in Singapore
H1: Being a tax haven does have an impact on unemployment in Singapore

H0: Being a tax haven has no impact on unemployment in Switzerland.
H1: Being a tax haven has an impact on unemployment in Switzerland.

H0: Tax havens have no impact on unemployment in the United States.

H1: Tax havens impact on unemployment in the United States.

H0: Tax havens have no impact on unemployment in the United Kingdom.
H1: Tax havens impact on unemployment in the United Kingdom.

3.4 Statistical techniques
The research employs adequate statistical models to justify the basis of the study. The technique to be utilized in the research are; the unit root stationarity test, ARDL Bounds testing and ARDL Cointegration and Long-run Form. Furthermore, necessary diagnostics test is also carried out to justify the validity of the results obtained. These techniques adopted by the researcher are explained below.

3.4.1 Unit root
In statistical analysis, the time series data have generally been presupposed to be formulated through a stochastic measure. The significance of having to carry out stationarity test is to devoid from ascertain inconsistent outcome in the data estimations (see Karahan et al., 2012; and Datta and Kumar, 2011). In this research, the study will be adopting the widely known Augmented Dickey-Fuller (ADF) analysis for unit root to determine the existence of unit root and to also determine the order of integration of the macroeconomic variables the researcher adopted (Alamro and Al-dalaien, 2014). Despite the fundamental factor that the ARDL bounds testing methodology which is subsequently carried out by the researcher does not necessitates the determination of order of integration of variables prior to conducting the test, it is nevertheless incumbent on the researcher to act rationally by testing for unit root to ensure the macroeconomic variables used in the project are integrated of order zero to one, that is, $\mathrm{I}(0)$ to $\mathrm{I}(1)$ and not higher than two, $\mathrm{I}(2)$, in relation to the argument cited by Davidescu (2015) and Pinn et al. (2011) that in ARDL bounds procedure relies on the phenomenon that data used are either $\mathrm{I}(1)$ or $\mathrm{I}(0)$.
In carrying out the stationarity test, the widely recognized Augmented Dickey-Fuller (ADF) technique which is an augmented version of the Dickey-Fuller (DF) stationarity procedure is utilized (see Pinn et al., 2011 and Dickey and Fuller, 1979). The utilization of the former is key to avoid obtaining results with serial correlations. Thus, the ADF approach employs the inclusion of sufficient lag number to prevent these correlation issues. However, in ascertaining the sufficient lag to adopt, the Akaike Information Criterion (AIC) technique is utilized. The three basic equations below present the widely used ADF stationarity unit root model adopted from Davidescu (2015) and Pinn et al. (2011);

$$\Delta\pi_t = \varpi\pi_{t-1} + \sum_{i=1}^{p} + \beta_i \Delta\pi_{t-1} + \phi_t \quad (3.1)$$

$$\Delta\pi_t = \alpha_0 + \varpi\pi_{t-1} + \sum_{i=1}^{p} + \beta_i \Delta\pi_{t-1} + \phi_t \quad (3.2)$$

$$\Delta\pi_t = \alpha_0 + \varpi\pi_{t-1} + \alpha_2 t + \sum_{i=1}^{p} + \beta_i \Delta\pi_{t-1} + \phi_t \quad (3.3)$$

Upon attainment of the output from the test, the results are being interpreted and analysed through the adoption of their respective critical values. From the results obtained, the null hypothesis which states the absence of unit root is being rejected (i.e. $\pi_t = 0$) in a scenario where the t-statistics value is higher than the figure in the value table. Likewise, if it is beneath, null hypothesis is accepted (i.e. $\pi_t \neq 0$), and states that the data is non-stationary. Furthermore, when the variable is stationary at the initial point, the variable is identified as being integrated at order zero, i.e. $\mathrm{I}(0)$. However, when non-stationarity is attained at the initial stage, the first difference of the variable is estimated for unit root which upon attainment is said to be an $\mathrm{I}(1)$ variable. The process is continued till the variable attains stationarity (Gujarati, 2004).

3.4.2 ARDL bounds testing
furthermore, after conducting the ADF technique, the research subsequently estimates the test for ascertain cointegration interaction by utilizing the relationship the ARDL technique for bounds testing to identify if a long-run correlation exists between the macroeconomic variables employed in the study.
Basically, the ARDL model can be justified to have been adopted by the researcher due to its ability to express a consistent statistical argument irrespective of if a short or long-run is present, or if the data are $I(1)$ or $I(0)$.
Secondly, the approach proffer a substitute to the cointegration/error-correction analysis that is employed generally which devoid from the pretesting obstacles embedded in the commonly cointegration

estimations- the Phillips-Hansen semi-parametric, and the Johansen maximum likelihood.

Furthermore, Pesaran and Shin (1999) made the assertion that the Phillips-Hansen is proportionally interrelated with the ARDL procedure, excluding the fact that the latter surpasses the Phillips-Hansen technique (see Davidescu, 2015; Karahan et al., 2012; Pinn et al., 2011).

Therefore, the ARDL (p, q) equation adopted by the research is;

$$\Delta\pi_t = \alpha_0 + \alpha_1\pi_{t-1} + \beta_1\partial_{t-1} + \sum_{i=1}^{p} \varpi_i\Delta\pi_{t-i} + \sum_{j=0}^{q} \Theta_j\Delta\partial_{t-j} + \phi_t \quad (3.4)$$

where, π_t represent the dependent variable and ∂_t stands for the independent variables. α_1 and β_1 are long-run interaction coefficients, α_0 and ϕ_t, represent the shift and error term respectively.

The ARDL procedure is undertaken by using the ordinary least squares (OLS) approach of the function to specify the presence of an interaction existing in the macroeconomic variables used by undergoing a F-test process that will confirm a joint significance result of the parameters α_1 and β_1. Notwithstanding, null hypothesis symbolizing cointegration, i.e., $H_0 : \alpha_1 = \beta_1 = 0$, is evaluated in comparison to the alternative symbolizing no cointegration, i.e., $H_1 : \alpha_1 \neq \beta_1 \neq 0$. In reference to the work of Pesaran and Shin (1992) and Pesaran et al. (2001), two simultaneous critical values analysing long-run symbiosis amidst a phase where the predictor variables are $I(m)$, thus, $0 \leq m \leq 1$. Ascertaining a low figure symbolizes that the descriptive variables are $I(0)$, likewise ascertain a high figure predicts that descriptive variables are solely $I(1)$. Thus, when the output obtained specifies the calculated F-statistic is supersedes the upper bound, null hypothesis can be disregarded notwithstanding the variables' order of integration. Likewise, when the calculated F-statistic is lower than the lower bound, the reverse applies, which affirms the null hypothesis. Moreover, if the calculated F-statistic appears within both the upper and lower bounds, the ascertained result is taken to be indecisive (see Pinn et al., 2011; Pesaran and Shin, 1992 and Pesaran et al., 2001).

Upon the completion of the estimation of the specification (3.4) and haven attained a cointegration interaction, the ARDL (p, q) long-run test for π_t is undergone and presented as;

$$\Delta\pi_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1\,\pi_{t-i} + \sum_{i=0}^{q} \beta_1\partial_{t-i} + \phi_t \quad (3.5)$$

The above function (3.5) is run via the OLS procedure, and ϕ_t ascertained and estimated in the function (3.6) which will serve as the error correction term. However, the ARDL (p, q) procedure which the researcher embarks of utilizing is obtained by the adoption of the Akaike Information Criterion (AIC).

The last phase of the procedure of the ARDL model is estimation of an Error Correction procedure (ECM system). After completing the procedure and a cointegration interaction is sighted, the ECM procedure is thus utilized. This is thus done by obtaining the short-run dynamics via estimating ECM based on long-run parameters which is shown as;

$$\Delta\pi_t = \alpha_0 + \sum_{i=1}^{p} \delta_i\Delta\pi_{t-i} + \sum_{j=0}^{q} \Theta_j\Delta\partial_{t-j} + \varphi ecm_{t-1} + \phi_t \quad (3.6)$$

Moreover, in relation to the results ascertained by the estimation of the function (3.6), if no presence of cointegration, the ECM procedure with the exclusion of an error correction term. This is given as;

$$\Delta\pi_t = \alpha_0 + \sum_{i=1}^{p} \delta_i\Delta\pi_{t-i} + \sum_{j=0}^{q} \Theta_j\Delta\partial_{t-j} + \phi_t \quad (3.7)$$

That is; δ and Θ denoted the dynamics of short-run parameters, on the other hand, φ symbolizes the rate of adjustment by reference to model (3.6).

Furthermore, when completing the ARDL procedure, relevant diagnostic testing is subsequently undertaken to validate the outcome reached. For example, to devoid having the issues of error normal distribution, devoid correlation obstacles, and lastly run heteroscedasticity testing.

Thus, before embarking on the ARDL procedure in the model (3.4), a justifiable number of lags are needed to be specified to justify the outcome, i.e., attaining an optimal lag order (p). Significant measures of identifying optimal lag operator exist, namely; the use of Hannan-Quinn criterion (HQ), Akaike Information Criterion (AIC) and the Schwarz Information Criterion (SIC) frameworks, thus, only one technique scan be utilized (Hossain, 2011). However, for this study the researcher is employing the Akaike Information Criterion (AIC) procedure. The specification of optimal lag is necessary due to the factor that utilizing lower number of lags can expose the researcher to the risk of illuminating necessary data, likewise, utilizing large number of lags will expose the study to analysing of more than sufficient parameters, and can yield errors in estimations (Khim and Liew, 2004).

4.EMPIRICAL EVIDENCE RESULTS AND ANALYSIS

Upon the attainment of outcomes obtained from the statistical analysis carried out, the researcher goes further to interpret, report and justify the results. Thus, the section below present the empirical chapter of the study in attempting to ascertain the economic co-existence existing between tax and unemployment using four tax and four non-tax haven economies. The countries used as the case study of the research are; Singapore and Switzerland which are the tax haven economies and UK and US which represent the non-tax haven economies. That is, to test if tax haven economies generate significant level of unemployment as opposed to non-tax haven economies. The chapter also tries to link the empirical outcome from the analysis conducted to existing literature to evaluate its applicability.

4.1 Unit root for stationarity

The first step of the empirical analysis of the research is to undergo a stationarity estimation in a bid to identify the order of integration of the data, and to be free of attaining spurious output. Therefore, in identifying unit root in the employed data, the research is utilizing the ADF mechanism. Thus, the output derived from this process on the data for the four economies can show that for Singapore; $RGDP_t$ and FDI_t are integrated at order one, i.e $I(0)$, whilst $UNEM_t$, INV_t, and REV_t are integrated at order one., i.e. $I(1)$. For Switzerland, the result show; $RGDP_t$ as $I(0)$ variable, while $UNEM_t$, INV_t, REV_t and FDI_t are $I(1)$ variables. For the UK data; $RGDP_t$, INV_t, REV_t, and FDI_t are I(1) variables, whilst $UNEM_t$ is shown as an I(2). Lastly, on the US data, the output reveal $RGDP_t$ is an I(0) variable, whilst $UNEM_t$, INV_t, REV_t and FDI_t are I(1) variables (refer to appendices 1 to 21 for all unit root test results of all the economies).

Nonetheless, the results of the ADF unit root estimations are presented in the following tables for each economy adopted in the study;

Table 2: ADF Unit Root Test Result for Singapore

Variables	Augmented Dickey-Fuller t-statistic	P-Value	Conclusion
$UNEM_t$	-6.912398	0.0000	$I(1)$
$RGDP_t$	-4.979537	0.0017	$I(0)$
FDI_t	-5.697668	0.0003	$I(0)$
INV_t	-6.792628	0.0000	$I(1)$
REV_t	-5.245425	0.0009	$I(1)$

Table 3: ADF Unit Root Test Result for Switzerland

Variables	Augmented Dickey-Fuller t-statistic	P-Value	Conclusion
$UNEM_t$	-4.412620	0.0074	$I(1)$
$RGDP_t$	-4.253819	0.0102	$I(0)$
FDI_t	-4.681421	0.0042	$I(1)$
INV_t	-6.443910	0.0000	$I(1)$
REV_t	-5.702554	0.0000	$I(1)$

Table 4: ADF Unit Root Test Result for UK

Variables	Augmented Dickey-Fuller t-statistic	P-Value	Conclusion
$UNEM_t$	-5.309651	0.0008	$I(2)$
$RGDP_t$	-4.973307	0.0019	$I(1)$
FDI_t	-6.903656	0.0000	$I(1)$
INV_t	-4.653762	0.0040	$I(1)$
REV_t	-5.572491	0.0004	$I(1)$

Table 5: ADF Unit Root Test Result for US

Variables	Augmented Dickey-Fuller t-statistic	P-Value	Conclusion
$UNEM_t$	-3.736719	0.0346	$I(1)$
$RGDP_t$	-3.832389	0.0272	$I(1)$
FDI_t	-5.535232	0.0004	$I(1)$
INV_t	-5.216024	0.0010	$I(1)$
REV_t	-5.240163	0.0011	$I(1)$

4.2 ARDL bounds estimation results

The next econometric analysis carried by the researcher upon the completion of the stationarity test is the ARDL bounds estimations. In undergoing this process, it is needed for the researcher to ascertain the optimal lag operator be adopted which is necessary in the ARDL framework. The identify the optimal lag operator, the study is adopting the Akaike Information Criterion (AIC) criterion (others are; Schwarz criterion, Hannan-Quinn criterion and Durbin-Watson stat). However, the optimal lag identified and adopted as expressed by the AIC mechanism is 4 for all the economies of Singapore, Switzerland, UK and US. The results obtained for each of the counties are explained in the sections below by categorizing the analysis into tax and non-tax haven economies.

4.2.1 Singapore results

For Singapore which is a tax haven economy, upon determining the order of integration of the data and the optimal lag number to be adopted, the researcher proceeds to the estimation of the ARDL specification in the equation (3.4) to obtain the economic correlation that exist between the variables in the model. That is to determine the nature of contribution of tax haven economies to the generation of unemployment in the country. The results report that the F-statistics, $F_N(UNEM/FDI) = 27.70168$ is above the upper level values of 3.09, 3.49, 3.87 and 4.37, and lower level values of 2.2, 2.56, 2.88 and 3.29 at both 10%, 5%, 2.5% and 1% accordingly. This can be affirmed that there is an existing long-run correlation between Unemployment, Real Gross Domestic Product (RGDP), Total Investments, General Government Revenue and Foreign Direct Investment, thus, rejecting the null hypothesis (refer to appendix 22 for results of the analysis).

By concluding a long-run cointegration relationship between tax haven regime and unemployment, the research further estimates the long-run interaction utilizing the ARDL (p, q) function. Thus, with the empirical result reporting a long-run correlation, the next phase of the procedure is to undergo the ECM model that provides the short-run dynamic estimators in relation to the estimation of the equation (3.5). Furthermore, the study runs the ARDL (3, 2, 3, 4, 1) long-run function shown in appendix 22. Nevertheless, the empirical result express that the parameter of long-run correlation for RGDP is -0.495300 appearing statistically significant showing negative sign. Thus, this evidence suggest that a negative and long-run relationship is present between unemployment and RGDP, and that the shift in RGDP will result to a reduction in the unemployment rate of Singapore overtime. The outcome further states that a 1% rise in the level of RGDP will subsequently reduce the rate of unemployment by 0.49%. Also, from the analysis carried out, the coefficients of FDI and investment are also significant with both showing a negative correlation. This however suggest that a 1% rise in the FDI and rate of investments will reduce the unemployment profile of the economy by 0.23% and 0.17% respectively, while the coefficient of total revenue is not statistically valid, but nevertheless presenting a positive correlation. That is, a 1% increase in total revenue collected by government will increase unemployment by 0.07% respectively.

Nonetheless, the ARDL (3, 2, 3, 4, 1) function for Singapore revealed the ECM coefficient is statistically valid showing p-value of 0.000 and presents a negative correlation, thus, the parameter of adjustment rate in respect of the shift from RGDP, FDI, total investments and total revenue is -0.388, which explains that 0.39% of disequilibria from the past period due to fluctuations flows from RGDP, FDI, total investments and total revenue to unemployment and later converges to the stabilized position on the long-run in Singapore. Thus, it can be argued that there is presence of short-run interaction amongst the macroeconomic indicators. The output of the analysis suggest that the empirical evidence obtained are in line with the evidence proposed by Stasiunaityte (2014); Lean and Tan (2011); and Okoli et al. (2014).

However, in justifying the validity of the statistical processes undergone, necessary diagnostics testing is being carried out by the researcher and it can be concluded that the ARDL framework employed in the study is free of serial correlation having p-value of 0.715 (at lag 1), 0.934 (at lag 2), 0.247 (at lag 3) and 0.177 (at lag 4), normality test showing 0.7810 and 0.6244 for homoscedasticity analysis (the diagnostics testing evidences are presented in appendix 22). Being a tax haven has no impact on unemployment in Singapore.

4.2.2 Switzerland results

Switzerland also a tax haven economy is being analysed and evaluated to test and justify the argument of the study based on the function (3.4). The ARDL procedure employed in the research show that the F-statistics, $F_N(UNEM/FDI) = 8.459294$ is above the upper level values of 3.09, 3.49, 3.87 and 4.37, and lower level values of 2.2, 2.56, 2.88 and 3.29 at both 10%, 5%, 2.5% and 1% accordingly. Thus, it can be argued that is an existing long-run correlation between Unemployment, Real Gross Domestic Product (RGDP), Total Investments, General Government Revenue, and Foreign Direct Investment, thus, rejecting the null hypothesis (refer to appendix 23 for the empirical results)

Furthermore, to determine the long-run cointegration relationship between tax haven regime and unemployment, the research subsequently estimates the long-run interaction using the ARDL (p, q) mechanism. Thus, empirical findings report a long-run correlation. Upon obtaining this, the ECM model which provides the short-run dynamic estimators based on estimation of the equation (3.5) is adopted. The study runs the ARDL (3, 4, 4, 4, 3) long-run function shown presented in appendix 23. The output show that the parameter of long-run correlation for RGDP is -3.210437 which is valid and has a negative sign. Therefore, a negative and long-run relationship exist amongst unemployment and RGDP, and that the shift in RGDP will result to a reduction in the unemployment rate of the Switzerland economy. That is, a 1% rise in the level of RGDP will subsequently lower unemployment by 3.2%. Again, the empirical findings show that the coefficients of investment and total revenue are significant having values of -1.254177 and -3.302587 with both showing negative interaction. Thus, a 1% rise in the rate of investments and total revenue will reduce the unemployment profile of the economy by 1.25% and 3.30% respectively, while the coefficients of FDI are also statistically valid, but nevertheless presenting a positive correlation. That is, a 1% increase in inflation will increase unemployment by 5.21%, 0.41% and 8.54% respectively.

However, the ARDL (3, 4, 4, 4, 3) specification for Switzerland show the ECM coefficient is statistically valid having p-value of 0.0000 and presents a negative correlation, thus, the parameter of adjustment rate in respect of the shift from RGDP, FDI, total investments and total revenue is -0.40, which explains that 0.4% of disequilibria from the past period due to fluctuations flows from RGDP, FDI, total investments and total revenue to unemployment and later converges to the stabilized position on the long-run in Switzerland. Thus, it can be argued that there is presence of short-run interaction amongst the macroeconomic indicators. The output of the analysis suggest that the empirical evidence obtained are in line with the evidence proposed by Stasiunaityte (2014); Lean and Tan (2011); and Okoli et al. (2014).

However, in justifying the validity of the statistical processes undergone, necessary diagnostics testing is being carried out by the researcher and it can be concluded that the ARDL framework employed in the study is free of serial correlation, heteroscedasticity and normality of error distribution with each showing a p-value at 0.041 (at lag 1), 0.080 (at lag 2), 0.153(at lag 3) and 0.258 (at lag 4) for serial correlation, 0.9423 for normality test and 0.9211 for homoscedasticity respectively (refer to appendix 23 for all the results of the diagnostics testing). Therefore, we reject the null hypotheses that being a tax haven has no impact on unemployment in Switzerland.

4.2.3 UK results

Analysing the empirical findings on the UK being a non-tax haven economy has expressed that the F-statistics, $F_N(UNEM/FDI) = 2.788740$ is lower than the upper level values of 3.09, 3.49, 3.87 and 4.37 at 10%, 5% and 2.5% respectively, and however higher than the lower level values of 2.2 and 2.27 at 10% and 5% respectively, and thus lower than the lower level values of 2.88 and 3.29 at 2.5% and 1% accordingly. This symbolizes that for the UK economy, the F-statistics is below the upper level and above the lower level bounds at 10% and 5% and lower than the lower bounds at 2.5% and 1% (refer to appendix 24 for the empirical evidences). Therefore, this policy of indecisive outcome applies to the UK economy, i.e., the model is not fully compatible with the economy of UK.

However, regardless of the insignificant values arrived at, the long-run cointegration interaction between tax haven regime and unemployment in the UK economy is being identified and explored. The study proceeds to the estimation of the long-run interaction using the ARDL (p, q) mechanism. However, the long-run correlation has been identified and the next phase is to estimate the ECM model shown in specification (3.5), which gives the short-run dynamic estimators of the model. The ARDL model to be used for the case of UK is shown as (2, 0, 2, 0, 2) which is presented in appendix 24.

Empirical findings thus, suggest that the long-run parameter for RGDP is -1.377056 having a p-value of 0.0228 which is less than 5% (0.05), statistically valid and rightly signed negative. Nevertheless, a negative and long-run relationship exist amongst unemployment and RGDP in UK, and a 1% rise in the level of RGDP will yield decline in the unemployment level of the UK economy by 1.38%. Furthermore, the coefficient of total revenue which also tends to be statistically significant and signed negative presents a value of -0.288 and p-value of 0.0033 suggest that a 1% rise in the level of total revenue will yield decline in the unemployment level by 0.29%. The coefficients of FDI and investment are statistically insignificant, having values of -0.22 and -0.24 and p-values of 0.2711 and 0.2866 respectively. Therefore, a 1% rise in FDI and total investments can yield a decline in unemployment by 0.22% and 0.24% respectively. Nonetheless, this is in line with the study of Eldeeb (2015). Therefore, with the establishment of this fact it can be reported that from the empirical analyses done, the macroeconomic indicators adopted in the study to determine unemployment channelled via tax-haven policies is in inconsistent to the UK, but however, show significant effects of RGDP, FDI and total investment in reducing the unemployment level of the economy.

Thus, the ARDL (2, 0, 2, 0, 2) specification for UK show the ECM coefficient is statistically valid with p-value of 0.0000 and presents a negative correlation, thus, the parameter of adjustment rate in respect of the shift from RGDP, FDI, total investments and total revenue is -0.21, which explains that 0.21% of disequilibria from the past period due to fluctuations flows from RGDP, FDI, total investments and total revenue to unemployment and later converges to the stabilized position on the long-run in UK. Thus, it can be argued that there is presence of short-run interaction amongst the macroeconomic indicators. The output of the analysis suggest that the empirical evidence obtained are in line with the evidence proposed by Ojong, Anthony and Arikpo (2016).

Nevertheless, diagnostics testing has been done and the results of the analysis present that the ARDL framework employed in the study is free of serial correlation, heteroscedasticity and normality of error distribution with each showing a p-value at 0.328 (at lag 1), 0.384 (at lag 2), 0.566 (at lag 3) and 0.713 (at lag 4) for serial correlation, 0.517272 for normality test and 0.5732 for homoscedasticity analysis respectively (refer to appendix 24 for all the results of the diagnostics testing). Hence, we fail to reject the null hypotheses that tax havens have no impact on unemployment in United Kingdom

4.2.4 US results

Lastly, empirical findings on the US economy which is a largely non-tax haven economy has expressed that the F-statistics, $F_N(UNEM/FDI) = 3.441958$ is higher that the upper level values of 3.09 at 10% and lower the than the upper bounds of 3.49, 3.87 and 4.37 at 5%, 2.5% and 1% respectively, and higher than the lower level values of 2.2, 2.56, 2.88 and 3.29 at both 10%, 5%, 2.5% and 1% accordingly. Thus, it can be argued that is an existing long-run correlation between Unemployment, Real Gross Domestic Product (RGDP), FDI, Total Investments and General Government Revenue at 5%, 2.5% and 1% levels refer to appendix 25 for full empirical evidence).

The research further attempts to determine the long-run cointegration interaction between tax haven regime and unemployment in the US economy via the estimation of the long-run cointegration process using the ARDL (p, q) mechanism. Due to the outcome of the analysis which show a long-run cointegration form, the researcher subsequently embarks on utilizing the ECM model shown in specification (3.5), which gives the short-run dynamic estimators of the model. The ARDL mechanism identified as the most appropriate for the US economy is presented as (4, 3, 1, 4, 4). From the analyses, evidence show RGDP long-run parameter as -0.653942 having p-value higher than 5% (0.05), and statistically invalid and nevertheless signed negative. This obtained outcome shows that a negative and invalid correlation exists between RGDP and unemployment, and 1% rise in RGDP will reduce the unemployment rate by 0.65% notwithstanding the statistical validity of the outcome. Also, coefficients of FDI and total investment show a negative correlation with unemployment, as well as being statistically unjustifiable having p-value of 0.5123 and 0.5382 respectively which is less than the 5% (0.05) significant level. Thus, regardless of the validity of the evidence, it present that a 1% rise in FDI and investment can yield a rise in unemployment by 1.2 % and 0.6% respectively. Lastly, the coefficient of total revenue showing a value of 2.523 with p-value of 0.5847 and signed positive suggest that a positive interaction exist between revenue and unemployment, i.e., a 1% rise in revenue will reduce the unemployment rate of the US economy by 2.5%. Hence, this empirical evidence is consistent to the findings of Okoli et al. (2014); and Slemrod and Wilson (2010) which disputes the argument that tax haven policies are unfavourable to an economy.

Furthermore, the ARDL (4, 3, 1, 4, 4) function of the US economy present that the ECM coefficient is statistically valid with a p-value of 0.0003 and presents a negative correlation, thus, the parameter of adjustment rate in respect of the shift from RGDP, FDI, total investments and total revenue is -0.23, which explains that 0.23% of disequilibria from the past period due to fluctuations flows from RGDP, FDI, total investments and total revenue to unemployment and later converges to the stabilized position on the long-run in US. Thus, it can be argued that there is presence of short-run interaction amongst the macroeconomic indicators. The output of the analysis suggest that the empirical evidence obtained are in line with the evidence proposed by Ojong, Anthony and Arikpo (2016). (refer to appendix 25).

Similar to the analyses conducted on the data of Singapore, Switzerland and UK, the researcher has also embarked on diagnostics testing and all the results of the analyses present that the ARDL framework employed in the study is free of serial correlation, heteroscedasticity and normality of error distribution with each showing a p-value at 0.797 (at lag 1), 0.120 (at lag 2), 0.142 (at lag 3) and 0.196 (at lag 4) for serial correlation, 0.54758 for normality test and 0.9646 for homoscedasticity analyses respectively (refer to appendix 25 for all the results of the diagnostics testing). Also we fail to reject the null hypotheses that tax havens have no impact on unemployment in United Kingdom.

5.CONCLUSION

5.1 Summary of findings

In respect of the analyses carried out in the study to evaluate and analyse the nexus amongst unemployment and tax haven policies using a case study four economies, in which two are tax haven economies namely; Singapore and Switzerland, and two non-tax haven economies namely; UK and US. From the empirical analyses undergone via the utilization of the ARDL Bounds testing and ARDL Cointegration and Long-run Form procedures, it has been established that tax haven economies are more likely to generate unemployment than non-tax haven economies. The empirical evidence affirms that Singapore and Switzerland which are tax haven economies are more inclined to have more FDIs, gross investments and high RGDP flowing into the economies which reduces unemployment, and have a positive relationship between total revenue and unemployment which expresses that having a high revenue collection policies will increase unemployment, as the collection of more revenue will come from the collection of more taxes which is against the tax haven policies.

On the other hand, the results obtained in respect of the UK and US economies present that the results are inconclusive and statistically insignificant. Nevertheless, the empirical findings show significant effects of FDI and RGDP (which are indicators for measuring tax havens) in the reduction of unemployment in the economies.

For instance, from the analyses done by the researcher, Singapore and Switzerland being tax haven economies have an annually growth in RGDP growth at about 0.5% and 3.2%, gross investments of 0.2% and 1.3% and FDI inflow of 0.2% and 1.05% respectively. That is, countries with tax break economies are both expected to have more investment inflow and FDIs because of the tax-free regime, thereby leading to achieving an increase in the RGDP due to increase in production of goods and services which is attributed by the tax break policies. However, the value of total revenue which show the amount of revenue the government can collect annually mainly from sources, such as taxation shows a positive relationship for the Singapore economy suggesting a 1% rise in the gross revenue will increase the rate of unemployment by 0.1%, whilst shows a negative sign in the case of Switzerland expressing 1% rise in the gross revenue will decrease the rate of unemployment by 3.3%. That is, for the economy of Singapore, increase in government revenue via collection of more and higher taxes will increase the unemployment rate by 0.1% due to tax burden which can affect small businesses and arguably large businesses if the businesses have less funds to sustain their activities, make less profit due to inflation in the prices of the factors of production (i.e. land, labour and capital, as well as increase in raw material) or higher cost of production which can affect the businesses considering an enterprise cannot prosper and flourish and be able to pay taxes without earning significant profit to cover their full cost of production. Therefore, an economy on the verge of achieving significant level of growth and development tries to provide an enabling environment such as the granting of tax break and incentives to businesses which will tremendously attract both foreign and domestic investors to invest in the economy. Nevertheless, for Switzerland, increase in government revenue via collection of more and higher taxes will decrease unemployment rate by 3.3% contrary to the Singapore economy. These empirical findings are consistent to the work of Hong and Smart (2010) published in the European Economic Review Journal title; “In praise of Tax Havens: International Tax Planning and Foreign Direct investment”. The research of Hong and Smart (2010) embarked on formulating an economic model which tested the impacts and ramifications of competition and transfer of revenue from economy to economy based on international tax planning, tax bases and foreign investments. Their research proposed an economic theory that debunks the idea that tax haven economies operate to the detriment of the citizens, the nation as well as the global economy. Hong and Smart (2010) argued economies with increased investments flowing into it can yield the shift of revenue from country to country which can attribute to the drastic decline in tax rates, which will lead to more investments and more unemployment of labour to increase capacity.

Having a higher tax rate can deter individuals from establishing business and can lead to having low productivity rate and collapse of small business with low capital, or even prevent the small and large enterprises from expanding and diversifying their businesses and deter the unemployment of more labour due to lack of adequate funds as well as rise in the tax rate, thus find it difficult to adapt to the tax regime policies. Which thereby can yield retrenchment of workers or make it more challenging for the unemployed to get jobs, because with low resources the enterprises would not be able to employ more labour, and then result to increase in unemployment rate. Thus, in a tax haven economy, the enterprises will be able to free up their resources which instead of paying the tax levies, they can be able to inject the funds into their businesses to boost their activities and be able to employ more labour (see Stasiunaityte, 2014; Hong and Smart, 2010).

On the other hand, the analyses conducted by the researcher on the non-tax haven economies; UK and US in a bid to align and investigate its contribution to unemployment generation in the economies utilizing the ARDL Bounds testing and ARDL Cointegration and Long-run Form model suggest that the values obtained for both UK and US are statistically insignificant judging from the F-statistics values obtained for both economies which either appears within the upper and lower bounds and below the upper and upper bounds. Thus, showing significant effects of RGDP and FDI in addressing unemployment regardless of the insignificant value identified.

Therefore, the researcher can hereby conclude and argue that the tax haven policies adopted and implement by the Singapore and Switzerland economies are consistent and favourable to the economies, and have been able to attain and uphold the benefits and economics goals and objectives by which there were proposed, adopted and implemented for. Whilst for the UK and US economies, the data analysed can lead to the conclusion and argument by the researcher that the empirical evidence obtained for the UK and US economies in the study are inconclusive, and that the model proposed and adopted in the research are not compatible with both the former and latter economies.

5.2 Recommendations

Nevertheless, from the empirical findings obtained from the statistical techniques adopted in the research, the researcher present the following recommendations. Firstly, the policy makers of Singapore and Switzerland should be able to influence the tax base, propose and adopt tax break/holiday policies which will yield significant job generation that will further reduce unemployment in the economies.

Furthermore, the policy makers of the economies are also expected to create an enabling environment for jobs to thrive, and provide favourable incentives to individual interested in setting up businesses, both foreign and local.

Lastly, the policy makers are also expected to provide infrastructure and amenities required by the investors, such as roads, railways, electricity, water and security, in other to gain the confidence of business owners and attract more investors into the economies.

5.3 Limitations and recommendations for further research

The main objective of the study is to investigate the role of tax haven economies in reducing unemployment using Singapore and Switzerland as case studies, which the empirical outcome affirms this argument by obtaining justifiable and statistically valid results from the statistical techniques utilized, it was however challenging for the researcher to attain a statistically valid result from the estimation of the data on UK and US which are basically non-tax haven economies. Thus, the researcher recommends in future research for the development of a more appropriate model which will better address variations of unemployment in these two counties to attain valid arguments.

5.4 Policy implication

The policy implication of this research suggest that government of these economies can embark on formulating strong and sound tax policies which will gain the confidence of investors. The government should be able to develop the small and medium enterprises (SMEs) which are the key drivers of the economy and generates high amount of jobs. Also, the provision of packages comprising of; finance, taxes incentives and credit facilities can also attract investors to set up enterprises to be able to employ labour, subsequently, reduce unemployment rate in the economies.

Government of the economies must embark on developmental projects such a strengthening the production and manufacturing sectors by providing adequate and modern infrastructure such as; providing good transport system, electricity, roads and water among others. This can lead to ease of doing businesses in the country, and unemployment of more labour.

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APPENDIX

APPENDIX 1

Null Hypothesis: D(UNEM) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.912398	0.0000
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UNEM,2)
Method: Least Squares
Date: 07/24/17 Time: 19:48
Sample (adjusted): 1985 2016
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UNEM(-1))	-1.220564	0.176576	-6.912398	0.0000
C	-0.539671	0.297863	-1.811809	0.0804
@TREND("1983")	0.022143	0.014917	1.484440	0.1485

R-squared	0.623054	Mean dependent var	-0.012187
Adjusted R-squared	0.597058	S.D. dependent var	1.211762
S.E. of regression	0.769199	Akaike info criterion	2.402126
Sum squared resid	17.15835	Schwarz criterion	2.539539
Log likelihood	-35.43402	Hannan-Quinn criter.	2.447674
F-statistic	23.96703	Durbin-Watson stat	1.975150
Prob(F-statistic)	0.000001		

APPENDIX 2
Null Hypothesis: RGDP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.979537	0.0017
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RGDP)
Method: Least Squares
Date: 07/24/17 Time: 20:03
Sample (adjusted): 1984 2016
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP(-1)	-0.911194	0.182988	-4.979537	0.0000
C	7.342424	2.106588	3.485457	0.0015

@TREND("1983")	-0.099774	0.079200	-1.259776	0.2175

R-squared	0.452736	Mean dependent var	-0.198303
Adjusted R-squared	0.416252	S.D. dependent var	5.526434
S.E. of regression	4.222384	Akaike info criterion	5.805185
Sum squared resid	534.8557	Schwarz criterion	5.941231
Log likelihood	-92.78555	Hannan-Quinn criter.	5.850960
F-statistic	12.40908	Durbin-Watson stat	1.944444
Prob(F-statistic)	0.000118		

APPENDIX 3

Null Hypothesis: D(INV) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.792628	0.0000
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INV,2)
Method: Least Squares
Date: 07/24/17 Time: 20:05
Sample (adjusted): 1985 2016
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INV(-1))	-1.226265	0.180529	-6.792628	0.0000

APPENDIX 4

Null Hypothesis: D(INF) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.037496	0.0001
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF,2)
Method: Least Squares
Date: 07/24/17 Time: 20:06
Sample (adjusted): 1986 2016
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

APPENDIX 5

Null Hypothesis: D(REV) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.245425	0.0009
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(REV,2)
Method: Least Squares
Date: 07/24/17 Time: 20:07
Sample (adjusted): 1985 2016
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(REV(-1))	-1.047189	0.199639	-5.245425	0.0000
C	-0.569018	0.642465	-0.885680	0.3831
@TREND("1983")	0.022106	0.032209	0.686326	0.4980

R-squared	0.488928	Mean dependent var	0.147459
Adjusted R-squared	0.453681	S.D. dependent var	2.274199
S.E. of regression	1.680937	Akaike info criterion	3.965640
Sum squared resid	81.94097	Schwarz criterion	4.103053
Log likelihood	-60.45024	Hannan-Quinn criter.	4.011189
F-statistic	13.87171	Durbin-Watson stat	1.881923
Prob(F-statistic)	0.000059		

APPENDIX 6

Null Hypothesis: FDI has a unit root

Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.697668	0.0003
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI)
Method: Least Squares
Date: 07/24/17 Time: 20:09
Sample (adjusted): 1984 2016
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI(-1)	-1.040390	0.182599	-5.697668	0.0000
C	7.452636	2.084695	3.574929	0.0012
@TREND("1983")	0.467272	0.121363	3.850202	0.0006

R-squared	0.519850	Mean dependent var	0.435241
Adjusted R-squared	0.487840	S.D. dependent var	6.693754
S.E. of regression	4.790408	Akaike info criterion	6.057616
Sum squared resid	688.4403	Schwarz criterion	6.193662
Log likelihood	-96.95067	Hannan-Quinn criter.	6.103392
F-statistic	16.24024	Durbin-Watson stat	2.024824
Prob(F-statistic)	0.000017		

APPENDIX 7
Null Hypothesis: D(UNEM) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.412620	0.0074
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UNEM,2)
Method: Least Squares
Date: 07/24/17 Time: 20:29
Sample (adjusted): 1986 2016
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UNEM(-1))	-0.800686	0.181454	-4.412620	0.0001
D(UNEM(-1),2)	0.440519	0.171758	2.564765	0.0162
C	0.202992	0.246043	0.825026	0.4166
@TREND("1983")	-0.007689	0.012175	-0.631520	0.5330

R-squared	0.419988	Mean dependent var	0.009710
Adjusted R-squared	0.355543	S.D. dependent var	0.749282
S.E. of regression	0.601509	Akaike info criterion	1.941165
Sum squared resid	9.768967	Schwarz criterion	2.126196
Log likelihood	-26.08806	Hannan-Quinn criter.	2.001480
F-statistic	6.516934	Durbin-Watson stat	1.904836
Prob(F-statistic)	0.001849		

APPENDIX 8
Null Hypothesis: RGDP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.253819	0.0102
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RGDP)
Method: Least Squares
Date: 07/24/17 Time: 20:29
Sample (adjusted): 1984 2016
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP(-1)	-0.739990	0.173959	-4.253819	0.0002
C	1.691131	0.660909	2.558797	0.0158

@TREND("1983")	-0.018518	0.028656	-0.646228	0.5230

R-squared	0.377597	Mean dependent var	0.018576
Adjusted R-squared	0.336103	S.D. dependent var	1.918169
S.E. of regression	1.562921	Akaike info criterion	3.817499
Sum squared resid	73.28170	Schwarz criterion	3.953545
Log likelihood	-59.98873	Hannan-Quinn criter.	3.863274
F-statistic	9.100131	Durbin-Watson stat	1.799289
Prob(F-statistic)	0.000815		

APPENDIX 9

Null Hypothesis: D(INV) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.443910	0.0000
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INV,2)
Method: Least Squares
Date: 07/24/17 Time: 20:30
Sample (adjusted): 1985 2016
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INV(-1))	-1.134541	0.176064	-6.443910	0.0000
C	0.080706	0.587406	0.137395	0.8917
@TREND("1983")	-0.014132	0.029613	-0.477230	0.6368

R-squared	0.590584	Mean dependent var	0.065125
Adjusted R-squared	0.562348	S.D. dependent var	2.337783
S.E. of regression	1.546566	Akaike info criterion	3.799011
Sum squared resid	69.36414	Schwarz criterion	3.936424
Log likelihood	-57.78418	Hannan-Quinn criter.	3.844560
F-statistic	20.91629	Durbin-Watson stat	2.015515
Prob(F-statistic)	0.000002		

APPENDIX 10

Null Hypothesis: D(REV) has a unit root

Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.702554	0.0000
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(REV,2)
Method: Least Squares
Date: 07/24/17 Time: 20:31
Sample (adjusted): 1985 2016
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(REV(-1))	-1.037858	0.181999	-5.702554	0.0000
C	0.120533	0.100179	1.203174	0.2383

R-squared	0.520147	Mean dependent var	0.003969
Adjusted R-squared	0.504152	S.D. dependent var	0.787852
S.E. of regression	0.554778	Akaike info criterion	1.719963
Sum squared resid	9.233347	Schwarz criterion	1.811571
Log likelihood	-25.51940	Hannan-Quinn criter.	1.750328
F-statistic	32.51912	Durbin-Watson stat	1.994626
Prob(F-statistic)	0.000003		

APPENDIX 11
Null Hypothesis: D(FDI) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 3 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.681421	0.0042
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(FDI,2)
Method: Least Squares
Date: 07/24/17 Time: 20:32
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI(-1))	-3.349549	0.715498	-4.681421	0.0001
D(FDI(-1),2)	1.749813	0.634072	2.759645	0.0112
D(FDI(-2),2)	0.701870	0.439069	1.598542	0.1236
D(FDI(-3),2)	0.585875	0.239431	2.446945	0.0225
C	1.045908	1.632026	0.640865	0.5279
@TREND("1983")	-0.039648	0.078889	-0.502579	0.6200

R-squared	0.886935	Mean dependent var	-0.588165
Adjusted R-squared	0.862356	S.D. dependent var	9.353323
S.E. of regression	3.470122	Akaike info criterion	5.508248
Sum squared resid	276.9602	Schwarz criterion	5.791137
Log likelihood	-73.86960	Hannan-Quinn criter.	5.596845
F-statistic	36.08463	Durbin-Watson stat	1.967737
Prob(F-statistic)	0.000000		

APPENDIX 12
Null Hypothesis: D(UNEM,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.309651	0.0008
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UNEM,3)
Method: Least Squares
Date: 07/24/17 Time: 20:38
Sample (adjusted): 1986 2016
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UNEM(-1),2)	-0.995008	0.187396	-5.309651	0.0000
C	0.047952	0.328160	0.146123	0.8849

@TREND("1983")	-0.002878	0.016327	-0.176300	0.8613

R-squared	0.501838	Mean dependent var	0.030645
Adjusted R-squared	0.466255	S.D. dependent var	1.112836
S.E. of regression	0.813014	Akaike info criterion	2.515630
Sum squared resid	18.50779	Schwarz criterion	2.654403
Log likelihood	-35.99226	Hannan-Quinn criter.	2.560866
F-statistic	14.10330	Durbin-Watson stat	1.965316
Prob(F-statistic)	0.000058		

APPENDIX 13

Null Hypothesis: D(RGDP) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.973307	0.0019
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RGDP,2)

Method: Least Squares

Date: 07/24/17 Time: 20:39

Sample (adjusted): 1986 2016

Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP(-1))	-1.365526	0.274571	-4.973307	0.0000
D(RGDP(-1),2)	0.241877	0.181778	1.330613	0.1944
C	-0.315491	0.763498	-0.413217	0.6827
@TREND("1983")	0.012743	0.037983	0.335501	0.7398

R-squared	0.583149	Mean dependent var	-0.074224
Adjusted R-squared	0.536832	S.D. dependent var	2.771020
S.E. of regression	1.885857	Akaike info criterion	4.226556
Sum squared resid	96.02433	Schwarz criterion	4.411587
Log likelihood	-61.51162	Hannan-Quinn criter.	4.286871
F-statistic	12.59045	Durbin-Watson stat	2.035456
Prob(F-statistic)	0.000025		

APPENDIX 14

Null Hypothesis: D(INV) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.653762	0.0040
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INV,2)
Method: Least Squares
Date: 07/24/17 Time: 20:39
Sample (adjusted): 1985 2016
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INV(-1))	-0.852998	0.183292	-4.653762	0.0001
C	-0.429561	0.282735	-1.519305	0.1395

APPENDIX 15

Null Hypothesis: D(REV) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.572491	0.0004
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(REV,2)
Method: Least Squares
Date: 07/24/17 Time: 20:40
Sample (adjusted): 1985 2016
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

D(REV(-1))	-1.036036	0.185920	-5.572491	0.0000
C	1.620780	0.931383	1.740186	0.0924
@TREND("1983")	-0.057485	0.045837	-1.254105	0.2198

R-squared	0.517112	Mean dependent var	-0.010457
Adjusted R-squared	0.483810	S.D. dependent var	3.239620
S.E. of regression	2.327550	Akaike info criterion	4.616569
Sum squared resid	157.1072	Schwarz criterion	4.753982
Log likelihood	-70.86511	Hannan-Quinn criter.	4.662118
F-statistic	15.52768	Durbin-Watson stat	1.992370
Prob(F-statistic)	0.000026		

APPENDIX 16
Null Hypothesis: D(FDI) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.903656	0.0000
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI,2)
Method: Least Squares
Date: 07/24/17 Time: 20:42
Sample (adjusted): 1985 2016
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI(-1))	-1.407257	0.203842	-6.903656	0.0000
C	0.058978	1.152274	0.051184	0.9595
@TREND("1983")	0.017914	0.058247	0.307550	0.7606

R-squared	0.624802	Mean dependent var	0.329141
Adjusted R-squared	0.598926	S.D. dependent var	4.791856
S.E. of regression	3.034701	Akaike info criterion	5.147163
Sum squared resid	267.0729	Schwarz criterion	5.284575
Log likelihood	-79.35460	Hannan-Quinn criter.	5.192711
F-statistic	24.14626	Durbin-Watson stat	1.727494
Prob(F-statistic)	0.000001		

APPENDIX 17
Null Hypothesis: D(UNEM) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.736719	0.0346
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UNEM,2)
Method: Least Squares
Date: 07/24/17 Time: 20:46
Sample (adjusted): 1986 2016
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UNEM(-1))	-0.658015	0.176094	-3.736719	0.0009
D(UNEM(-1),2)	0.338061	0.169949	1.989197	0.0569
C	-0.138684	0.321302	-0.431632	0.6694
@TREND("1983")	0.004170	0.015900	0.262248	0.7951

R-squared	0.342872	Mean dependent var	-0.002957
Adjusted R-squared	0.269858	S.D. dependent var	0.906934
S.E. of regression	0.774961	Akaike info criterion	2.447905
Sum squared resid	16.21522	Schwarz criterion	2.632936
Log likelihood	-33.94253	Hannan-Quinn criter.	2.508220
F-statistic	4.695961	Durbin-Watson stat	1.963985
Prob(F-statistic)	0.009154		

APPENDIX 18
Null Hypothesis: RGDP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.832389	0.0272
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RGDP)
Method: Least Squares
Date: 07/24/17 Time: 20:47
Sample (adjusted): 1984 2016
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP(-1)	-0.657659	0.171605	-3.832389	0.0006
C	2.801953	0.934734	2.997595	0.0054
@TREND("1983")	-0.059439	0.031756	-1.871741	0.0710

R-squared	0.328899	Mean dependent var	-0.091418
Adjusted R-squared	0.284159	S.D. dependent var	1.758366
S.E. of regression	1.487707	Akaike info criterion	3.718857
Sum squared resid	66.39818	Schwarz criterion	3.854903
Log likelihood	-58.36115	Hannan-Quinn criter.	3.764633
F-statistic	7.351339	Durbin-Watson stat	1.828331
Prob(F-statistic)	0.002522		

APPENDIX 19
Null Hypothesis: D(INV) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.216024	0.0010
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INV,2)
Method: Least Squares
Date: 07/24/17 Time: 20:47
Sample (adjusted): 1985 2016
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INV(-1))	-0.818754	0.156969	-5.216024	0.0000

C	-0.349225	0.349530	-0.999128	0.3260
@TREND("1983")	0.010953	0.017676	0.619680	0.5403

R-squared	0.489922	Mean dependent var	-0.109438
Adjusted R-squared	0.454744	S.D. dependent var	1.249497
S.E. of regression	0.922646	Akaike info criterion	2.765918
Sum squared resid	24.68701	Schwarz criterion	2.903331
Log likelihood	-41.25469	Hannan-Quinn criter.	2.811467
F-statistic	13.92703	Durbin-Watson stat	1.636593
Prob(F-statistic)	0.000058		

APPENDIX 20

Null Hypothesis: D(REV) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 3 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.240163	0.0011
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(REV,2)
Method: Least Squares
Date: 07/24/17 Time: 20:48
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(REV(-1))	-1.914635	0.365377	-5.240163	0.0000
D(REV(-1),2)	0.961726	0.293437	3.277449	0.0033
D(REV(-2),2)	0.889984	0.245715	3.622008	0.0014
D(REV(-3),2)	0.563925	0.223576	2.522301	0.0190
C	0.399394	0.384432	1.038921	0.3096
@TREND("1983")	-0.020776	0.018515	-1.122146	0.2734

R-squared	0.596947	Mean dependent var	-0.098654
Adjusted R-squared	0.509327	S.D. dependent var	1.164336
S.E. of regression	0.815594	Akaike info criterion	2.612192
Sum squared resid	15.29947	Schwarz criterion	2.895081
Log likelihood	-31.87679	Hannan-Quinn criter.	2.700789
F-statistic	6.812905	Durbin-Watson stat	1.948018
Prob(F-statistic)	0.000495		

APPENDIX 21

Null Hypothesis: D(FDI) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.535232	0.0004
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI,2)
Method: Least Squares
Date: 07/24/17 Time: 20:50
Sample (adjusted): 1985 2016
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI(-1))	-1.025299	0.185231	-5.535232	0.0000
C	0.041804	0.238289	0.175435	0.8620
@TREND("1983")	0.000689	0.012020	0.057279	0.9547

R-squared	0.514053	Mean dependent var	-0.004329
Adjusted R-squared	0.480540	S.D. dependent var	0.870820
S.E. of regression	0.627631	Akaike info criterion	1.995331
Sum squared resid	11.42369	Schwarz criterion	2.132744
Log likelihood	-28.92529	Hannan-Quinn criter.	2.040879
F-statistic	15.33867	Durbin-Watson stat	1.992795
Prob(F-statistic)	0.000029		

APPENDIX 22

SINGAPORE ARDL

Step 1

Dependent Variable: UNEM
Method: ARDL
Date: 08/20/17 Time: 16:59
Sample (adjusted): 1987 2016
Included observations: 30 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): RGDP FDI INV REV

Fixed regressors: C
Number of models evalulated: 2500
Selected Model: ARDL(3, 2, 3, 4, 1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
UNEM(-1)	0.181898	0.097511	1.865418	0.0868
UNEM(-2)	0.215848	0.054428	3.965748	0.0019
UNEM(-3)	0.214231	0.036717	5.834639	0.0001
RGDP	-0.085573	0.013350	-6.409789	0.0000
RGDP(-1)	-0.074076	0.011531	-6.424110	0.0000
RGDP(-2)	-0.032539	0.010175	-3.198024	0.0077
FDI	-0.016646	0.006368	-2.613989	0.0226
FDI(-1)	-0.027673	0.006764	-4.091005	0.0015
FDI(-2)	-0.031124	0.008182	-3.803981	0.0025
FDI(-3)	-0.014895	0.008046	-1.851302	0.0889
INV	-0.026718	0.013263	-2.014535	0.0669
INV(-1)	-0.040108	0.016129	-2.486701	0.0286
INV(-2)	-0.007113	0.013661	-0.520685	0.6121
INV(-3)	0.022392	0.012588	1.778863	0.1006
INV(-4)	-0.016782	0.011030	-1.521535	0.1540
REV	-0.046893	0.022993	-2.039484	0.0640
REV(-1)	0.074756	0.025346	2.949420	0.0122
C	4.871018	0.756484	6.439025	0.0000

R-squared	0.983049	Mean dependent var	2.347500
Adjusted R-squared	0.959035	S.D. dependent var	0.691461
S.E. of regression	0.139950	Akaike info criterion	-0.811356
Sum squared resid	0.235031	Schwarz criterion	0.029362
Log likelihood	30.17034	Hannan-Quinn criter.	-0.542403
F-statistic	40.93691	Durbin-Watson stat	2.113299
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Step 2: Bound Testing
ARDL Bounds Test
Date: 08/20/17 Time: 17:02
Sample: 1987 2016
Included observations: 30
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	27.70168	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.2	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

Test Equation:
Dependent Variable: D(UNEM)
Method: Least Squares
Date: 08/20/17 Time: 17:02
Sample: 1987 2016
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UNEM(-1))	-0.430079	0.047239	-9.104227	0.0000
D(UNEM(-2))	-0.214231	0.036717	-5.834639	0.0001
D(RGDP)	-0.085573	0.013350	-6.409789	0.0000
D(RGDP(-1))	0.032539	0.010175	3.198024	0.0077
D(FDI)	-0.016646	0.006368	-2.613989	0.0226
D(FDI(-1))	0.046020	0.011620	3.960251	0.0019
D(FDI(-2))	0.014895	0.008046	1.851302	0.0889
D(INV)	-0.026718	0.013263	-2.014535	0.0669
D(INV(-1))	0.001504	0.012653	0.118840	0.9074
D(INV(-2))	-0.005609	0.011875	-0.472379	0.6451
D(INV(-3))	0.016782	0.011030	1.521535	0.1540
D(REV)	-0.046893	0.022993	-2.039484	0.0640
C	4.871018	0.756484	6.439025	0.0000
RGDP(-1)	-0.192188	0.015983	-12.02471	0.0000
FDI(-1)	-0.090338	0.014180	-6.370601	0.0000
INV(-1)	-0.068330	0.015744	-4.340019	0.0010
REV(-1)	0.027862	0.017346	1.606289	0.1342
UNEM(-1)	-0.388023	0.110048	-3.525936	0.0042

R-squared	0.977864	Mean dependent var	0.002100
Adjusted R-squared	0.946504	S.D. dependent var	0.605080
S.E. of regression	0.139950	Akaike info criterion	-0.811356
Sum squared resid	0.235031	Schwarz criterion	0.029362
Log likelihood	30.17034	Hannan-Quinn criter.	-0.542403
F-statistic	31.18232	Durbin-Watson stat	2.113299
Prob(F-statistic)	0.000000		

Step 3: ARDL Cointegrating And Long Run Form
ARDL Cointegrating And Long Run Form
Original dep. variable: UNEM
Selected Model: ARDL(3, 2, 3, 4, 1)

Date: 08/20/17 Time: 17:00
Sample: 1983 2016
Included observations: 30

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UNEM(-1))	-0.430079	0.032455	-13.251393	0.0000
D(UNEM(-2))	-0.214231	0.029090	-7.364517	0.0000
D(RGDP)	-0.085573	0.008643	-9.900825	0.0000
D(RGDP(-1))	0.032539	0.007649	4.254155	0.0011
D(FDI)	-0.016646	0.004717	-3.528824	0.0042
D(FDI(-1))	0.046020	0.007679	5.992909	0.0001
D(FDI(-2))	0.014895	0.006120	2.433963	0.0315
D(INV)	-0.026718	0.008474	-3.153054	0.0083
D(INV(-1))	0.001504	0.009215	0.163183	0.8731
D(INV(-2))	-0.005609	0.008025	-0.699008	0.4979
D(INV(-3))	0.016782	0.007200	2.331056	0.0380
D(REV)	-0.046893	0.016438	-2.852731	0.0145
CointEq(-1)	-0.388023	0.025287	-15.344846	0.0000

Cointeq = UNEM - (-0.4953*RGDP -0.2328*FDI -0.1761*INV + 0.0718*REV + 12.5534)

Long Run Coefficients

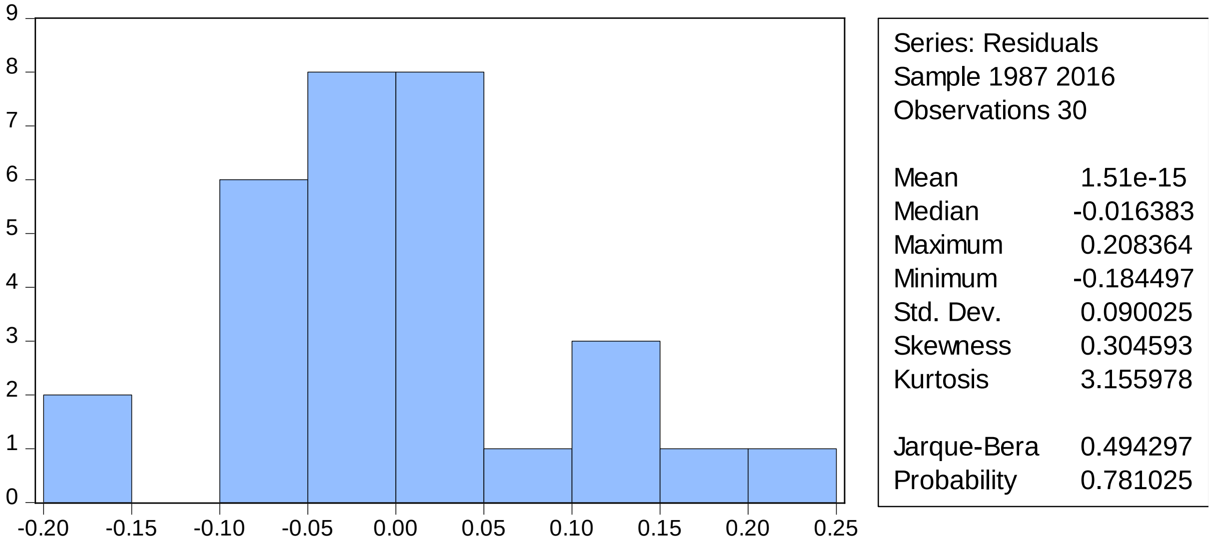
Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP	-0.495300	0.145182	-3.411573	0.0052
FDI	-0.232816	0.072340	-3.218338	0.0074
INV	-0.176097	0.040584	-4.339130	0.0010
REV	0.071806	0.047513	1.511306	0.1566
C	12.553419	2.589504	4.847809	0.0004

Autocorrelation
Date: 08/20/17 Time: 17:04
Sample: 1983 2016
Included observations: 30
Q-statistic probabilities adjusted for 3 dynamic regressors

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
. | . |	. | . |	1	-0.063	-0.063	0.1332	0.715
. | . |	. | . |	2	-0.011	-0.015	0.1371	0.934
.**| . |	.**| . |	3	-0.335	-0.339	4.1376	0.247
.**| . |	.**| . |	4	-0.243	-0.327	6.3177	0.177

*Probabilities may not be valid for this equation specification.

Normality



Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.856750	Prob. F(17,12)	0.6244
Obs*R-squared	16.44821	Prob. Chi-Square(17)	0.4923
Scaled explained SS	2.836958	Prob. Chi-Square(17)	1.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 08/20/17 Time: 17:04
Sample: 1987 2016
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.013448	0.066079	-0.203514	0.8421
UNEM(-1)	-0.009575	0.008518	-1.124112	0.2829
UNEM(-2)	-0.001156	0.004754	-0.243092	0.8120
UNEM(-3)	-0.002717	0.003207	-0.847265	0.4134
RGDP	0.000823	0.001166	0.705471	0.4940
RGDP(-1)	-0.000596	0.001007	-0.591552	0.5651
RGDP(-2)	-0.001168	0.000889	-1.313730	0.2135
FDI	0.001022	0.000556	1.837763	0.0910
FDI(-1)	0.000559	0.000591	0.945604	0.3630
FDI(-2)	0.000715	0.000715	1.000112	0.3370
FDI(-3)	-0.000205	0.000703	-0.291790	0.7754
INV	0.001255	0.001158	1.083130	0.3000

INV(-1)	-0.000844	0.001409	-0.599140	0.5602
INV(-2)	-0.000639	0.001193	-0.535572	0.6020
INV(-3)	-0.000595	0.001100	-0.540785	0.5986
INV(-4)	0.001006	0.000963	1.044215	0.3170
REV	-0.002962	0.002008	-1.474983	0.1660
REV(-1)	0.003905	0.002214	1.763904	0.1032

R-squared	0.548274	Mean dependent var	0.007834
Adjusted R-squared	-0.091672	S.D. dependent var	0.011700
S.E. of regression	0.012225	Akaike info criterion	-5.687024
Sum squared resid	0.001793	Schwarz criterion	-4.846305
Log likelihood	103.3054	Hannan-Quinn criter.	-5.418071
F-statistic	0.856750	Durbin-Watson stat	2.782926
Prob(F-statistic)	0.624380		

APPENDIX 23
SWITZERLAND ARDL
Step 1
Dependent Variable: UNEM
Method: ARDL
Date: 08/20/17 Time: 17:15
Sample (adjusted): 1987 2016
Included observations: 30 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): RGDP FDI INV REV
Fixed regressors: C
Number of models evalulated: 2500
Selected Model: ARDL(3, 4, 4, 4, 3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
UNEM(-1)	0.447328	0.209568	2.134525	0.0702
UNEM(-2)	-0.404701	0.262415	-1.542220	0.1669
UNEM(-3)	0.552110	0.202686	2.723963	0.0296
RGDP	-0.330714	0.055980	-5.907746	0.0006
RGDP(-1)	-0.315206	0.098287	-3.206987	0.0149
RGDP(-2)	-0.213008	0.100068	-2.128630	0.0708
RGDP(-3)	-0.269734	0.087086	-3.097343	0.0174
RGDP(-4)	-0.172413	0.078556	-2.194758	0.0642
FDI	0.057038	0.027047	2.108836	0.0729
FDI(-1)	0.066394	0.030226	2.196576	0.0641
FDI(-2)	0.098749	0.041911	2.356166	0.0506
FDI(-3)	0.122027	0.036174	3.373321	0.0119
FDI(-4)	0.080814	0.047887	1.687621	0.1353
INV	-0.009351	0.077567	-0.120548	0.9074
INV(-1)	-0.406443	0.112974	-3.597684	0.0088
INV(-2)	-0.031078	0.102088	-0.304424	0.7697

INV(-3)	0.122325	0.116069	1.053896	0.3269
INV(-4)	-0.183726	0.093417	-1.966716	0.0899
REV	-0.898406	0.229445	-3.915563	0.0058
REV(-1)	-0.286666	0.240814	-1.190403	0.2727
REV(-2)	0.117588	0.205343	0.572643	0.5848
REV(-3)	-0.270935	0.156533	-1.730856	0.1271
C	57.68989	11.25052	5.127756	0.0014

R-squared	0.991242	Mean dependent var	2.928667
Adjusted R-squared	0.963718	S.D. dependent var	1.279829
S.E. of regression	0.243781	Akaike info criterion	0.092952
Sum squared resid	0.416004	Schwarz criterion	1.167204
Log likelihood	21.60571	Hannan-Quinn criter.	0.436615
F-statistic	36.01304	Durbin-Watson stat	2.685702
Prob(F-statistic)	0.000032		

*Note: p-values and any subsequent tests do not account for model selection.

Step 2: Bound Testing

ARDL Bounds Test
Date: 08/20/17 Time: 17:16
Sample: 1987 2016
Included observations: 30
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	8.459294	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.2	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

Test Equation:
Dependent Variable: D(UNEM)
Method: Least Squares
Date: 08/20/17 Time: 17:16
Sample: 1987 2016
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.

D(UNEM(-1))	-0.147408	0.231756	-0.636051	0.5450
D(UNEM(-2))	-0.552110	0.202686	-2.723963	0.0296
D(RGDP)	-0.330714	0.055980	-5.907746	0.0006
D(RGDP(-1))	0.655154	0.147700	4.435711	0.0030
D(RGDP(-2))	0.442146	0.126834	3.486034	0.0102
D(RGDP(-3))	0.172413	0.078556	2.194758	0.0642
D(FDI)	0.057038	0.027047	2.108836	0.0729
D(FDI(-1))	-0.301590	0.071326	-4.228355	0.0039
D(FDI(-2))	-0.202841	0.065120	-3.114874	0.0170
D(FDI(-3))	-0.080814	0.047887	-1.687621	0.1353
D(INV)	-0.009351	0.077567	-0.120548	0.9074
D(INV(-1))	0.092479	0.096657	0.956774	0.3705
D(INV(-2))	0.061401	0.115254	0.532743	0.6107
D(INV(-3))	0.183726	0.093417	1.966716	0.0899
D(REV)	-0.898406	0.229445	-3.915563	0.0058
D(REV(-1))	0.153347	0.206604	0.742228	0.4821
D(REV(-2))	0.270935	0.156533	1.730856	0.1271
C	57.68989	11.25052	5.127756	0.0014
RGDP(-1)	-1.301074	0.212248	-6.129976	0.0005
FDI(-1)	0.425022	0.094217	4.511097	0.0028
INV(-1)	-0.508273	0.128741	-3.948017	0.0055
REV(-1)	-1.338419	0.262875	-5.091463	0.0014
UNEM(-1)	-0.405264	0.111584	-3.631922	0.0084

R-squared	0.972812	Mean dependent var	0.083033
Adjusted R-squared	0.887363	S.D. dependent var	0.726372
S.E. of regression	0.243781	Akaike info criterion	0.092952
Sum squared resid	0.416004	Schwarz criterion	1.167204
Log likelihood	21.60571	Hannan-Quinn criter.	0.436615
F-statistic	11.38472	Durbin-Watson stat	2.685702
Prob(F-statistic)	0.001466		

Step 3: ARDL Cointegrating And Long Run Form

ARDL Cointegrating And Long Run Form
Original dep. variable: UNEM
Selected Model: ARDL(3, 4, 4, 4, 3)
Date: 08/20/17 Time: 17:16
Sample: 1983 2016
Included observations: 30

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UNEM(-1))	-0.147408	0.119103	-1.237659	0.2557
D(UNEM(-2))	-0.552110	0.120948	-4.564833	0.0026
D(RGDP)	-0.330714	0.036378	-9.091013	0.0000

D(RGDP(-1))	0.655154	0.102844	6.370358	0.0004
D(RGDP(-2))	0.442146	0.081988	5.392841	0.0010
D(RGDP(-3))	0.172413	0.041933	4.111596	0.0045
D(FDI)	0.057038	0.014276	3.995297	0.0052
D(FDI(-1))	-0.301590	0.038309	-7.872566	0.0001
D(FDI(-2))	-0.202841	0.041962	-4.833938	0.0019
D(FDI(-3))	-0.080814	0.033591	-2.405820	0.0471
D(INV)	-0.009351	0.048233	-0.193861	0.8518
D(INV(-1))	0.092479	0.052837	1.750273	0.1235
D(INV(-2))	0.061401	0.050120	1.225088	0.2602
D(INV(-3))	0.183726	0.059184	3.104326	0.0172
D(REV)	-0.898406	0.132493	-6.780800	0.0003
D(REV(-1))	0.153347	0.109937	1.394863	0.2057
D(REV(-2))	0.270935	0.099083	2.734432	0.0292
CointEq(-1)	-0.405264	0.043446	-9.327909	0.0000

Cointeq = UNEM - (-3.2104*RGDP + 1.0488*FDI -1.2542*INV -3.3026*REV + 142.3515)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP	-3.210437	0.832842	-3.854798	0.0063
FDI	1.048753	0.344720	3.042332	0.0188
INV	-1.254177	0.424092	-2.957322	0.0212
REV	-3.302587	1.134663	-2.910632	0.0226
C	142.351503	46.507022	3.060860	0.0183

Autocorrelation

Date: 08/20/17 Time: 17:17

Sample: 1983 2016

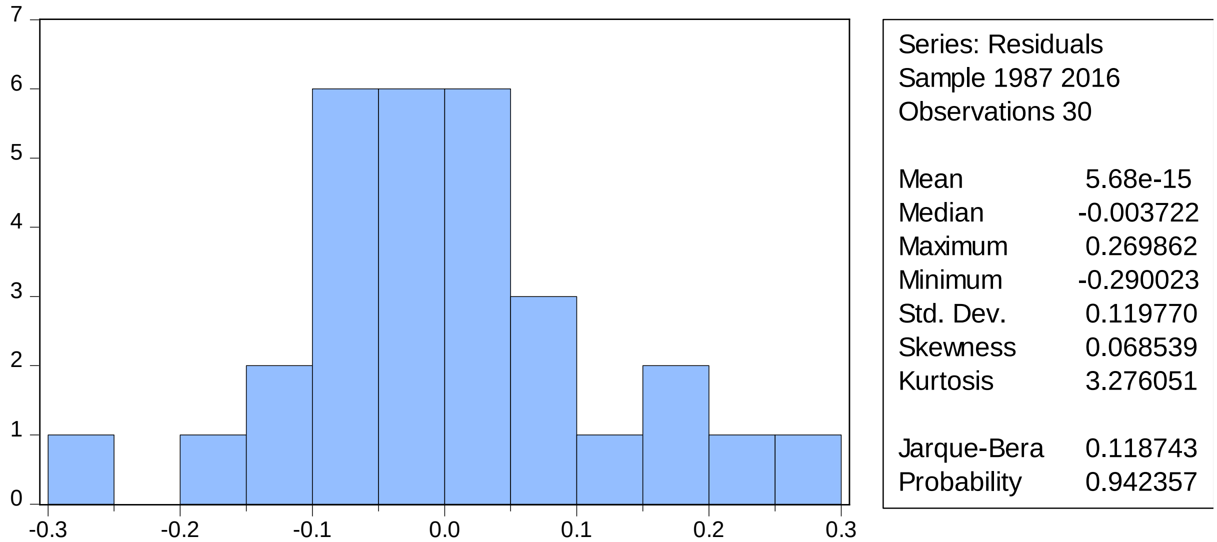
Included observations: 30

Q-statistic probabilities adjusted for 3 dynamic regressors

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
***| . |	***| . |	1	-0.356	-0.356	4.1936	0.041
. *| . |	.**| . |	2	-0.159	-0.327	5.0635	0.080
. |* . |	. *| . |	3	0.076	-0.148	5.2693	0.153
. | . |	. *| . |	4	-0.027	-0.135	5.2953	0.258

*Probabilities may not be valid for this equation specification.

Normality Test



Heteroskedasticity Test
Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.462357	Prob. F(22,7)	0.9211
Obs*R-squared	17.77069	Prob. Chi-Square(22)	0.7195
Scaled explained SS	1.101057	Prob. Chi-Square(22)	1.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 08/20/17 Time: 17:19
Sample: 1987 2016
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.836056	1.276121	0.655155	0.5333
UNEM(-1)	-0.001261	0.023771	-0.053037	0.9592
UNEM(-2)	-0.014617	0.029765	-0.491063	0.6384
UNEM(-3)	0.008935	0.022990	0.388653	0.7091
RGDP	0.001323	0.006350	0.208301	0.8409
RGDP(-1)	0.014467	0.011148	1.297660	0.2355
RGDP(-2)	-0.005034	0.011350	-0.443502	0.6708
RGDP(-3)	-0.003107	0.009878	-0.314571	0.7623
RGDP(-4)	0.004663	0.008910	0.523363	0.6169
FDI	0.000541	0.003068	0.176372	0.8650
FDI(-1)	-0.000519	0.003428	-0.151264	0.8840

APPENDIX 24
UK ARDL
Step 1
Dependent Variable: UNEM

Method: ARDL
Date: 08/20/17 Time: 17:23
Sample (adjusted): 1985 2016
Included observations: 32 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): RGDP FDI INV REV
Fixed regressors: C
Number of models evalulated: 2500
Selected Model: ARDL(2, 0, 2, 0, 2)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
UNEM(-1)	1.458889	0.092003	15.85690	0.0000
UNEM(-2)	-0.665943	0.102334	-6.507542	0.0000
RGDP	-0.285126	0.043911	-6.493207	0.0000
FDI	0.004399	0.028047	0.156837	0.8769
FDI(-1)	0.019760	0.031003	0.637342	0.5308
FDI(-2)	-0.069084	0.033365	-2.070544	0.0509
INV	-0.049648	0.044924	-1.105158	0.2816
REV	-0.040004	0.032860	-1.217395	0.2370
REV(-1)	0.050312	0.039220	1.282800	0.2135
REV(-2)	-0.069968	0.028825	-2.427357	0.0243
C	6.000112	2.315362	2.591436	0.0170

R-squared	0.982325	Mean dependent var	7.285156
Adjusted R-squared	0.973909	S.D. dependent var	2.015693
S.E. of regression	0.325592	Akaike info criterion	0.859942
Sum squared resid	2.226210	Schwarz criterion	1.363788
Log likelihood	-2.759065	Hannan-Quinn criter.	1.026953
F-statistic	116.7129	Durbin-Watson stat	2.310968
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Step 2: Bound Testing

ARDL Bounds Test
Date: 08/20/17 Time: 17:24
Sample: 1985 2016
Included observations: 32
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	2.788740	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.2	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

Test Equation:
Dependent Variable: D(UNEM)
Method: Least Squares
Date: 08/20/17 Time: 17:24
Sample: 1985 2016
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UNEM(-1))	0.331949	0.238993	1.388949	0.1794
D(FDI)	-0.034382	0.043239	-0.795153	0.4354
D(FDI(-1))	0.041306	0.052505	0.786702	0.4402
D(REV)	-0.028803	0.056602	-0.508870	0.6161
D(REV(-1))	0.131727	0.042408	3.106197	0.0053
C	2.862803	3.811320	0.751132	0.4609
RGDP(-1)	-0.221690	0.109505	-2.024479	0.0558
FDI(-1)	0.016651	0.086007	0.193605	0.8483
INV(-1)	-0.005817	0.070878	-0.082066	0.9354
REV(-1)	-0.034363	0.036159	-0.950313	0.3528
UNEM(-1)	-0.164379	0.125661	-1.308117	0.2050

R-squared	0.728110	Mean dependent var	-0.214063
Adjusted R-squared	0.598639	S.D. dependent var	0.816166
S.E. of regression	0.517066	Akaike info criterion	1.784995
Sum squared resid	5.614507	Schwarz criterion	2.288842
Log likelihood	-17.55992	Hannan-Quinn criter.	1.952006
F-statistic	5.623713	Durbin-Watson stat	2.321887
Prob(F-statistic)	0.000433		

Step 3: ARDL Cointegrating And Long Run Form
ARDL Cointegrating And Long Run Form
Original dep. variable: UNEM
Selected Model: ARDL(2, 0, 2, 0, 2)
Date: 08/20/17 Time: 17:24
Sample: 1983 2016
Included observations: 32

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UNEM(-1))	0.658286	0.114323	5.758128	0.0000
D(RGDP)	-0.282190	0.041825	-6.746896	0.0000

D(FDI)	0.005573	0.021877	0.254728	0.8014
D(FDI(-1))	0.070259	0.026409	2.660380	0.0146
D(INV)	-0.068713	0.080581	-0.852725	0.4034
D(REV)	-0.040977	0.027752	-1.476549	0.1546
D(REV(-1))	0.069528	0.025060	2.774431	0.0114
CointEq(-1)	-0.209064	0.034161	-6.119931	0.0000

Cointeq = UNEM - (-1.3771*RGDP -0.2170*FDI -0.2398*INV -0.2881*REV + 28.9784)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP	-1.377056	0.560403	-2.457260	0.0228
FDI	-0.216974	0.191971	-1.130244	0.2711
INV	-0.239781	0.219308	-1.093355	0.2866
REV	-0.288139	0.073307	-3.930574	0.0008
C	28.978440	8.754439	3.310143	0.0033

Autocorrelation

Auto

Date: 08/20/17 Time: 17:25

Sample: 1983 2016

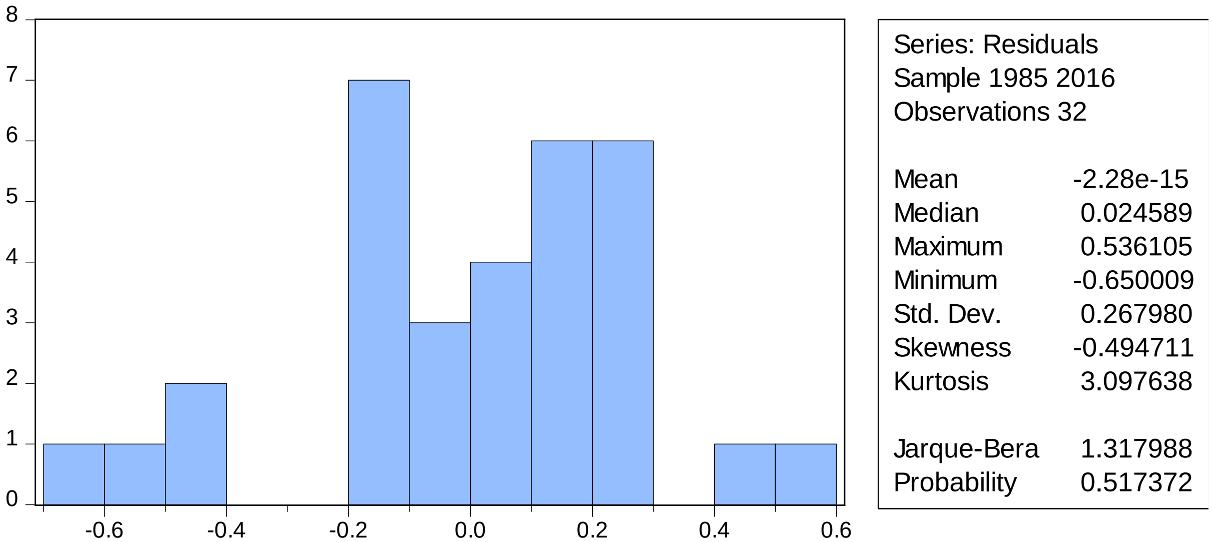
Included observations: 32

Q-statistic probabilities adjusted for 2 dynamic regressors

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
. *| . |	. *| . |	1	-0.165	-0.165	0.9559	0.328
. *| . |	. *| . |	2	-0.163	-0.195	1.9159	0.384
. | . |	. *| . |	3	-0.055	-0.128	2.0304	0.566
. | . |	. | . |	4	0.048	-0.023	2.1214	0.713

*Probabilities may not be valid for this equation specification.

Normality



Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.870245	Prob. F(10,21)	0.5732
Obs*R-squared	9.375600	Prob. Chi-Square(10)	0.4969
Scaled explained SS	4.234852	Prob. Chi-Square(10)	0.9361

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 08/20/17 Time: 17:26
Sample: 1985 2016
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.420477	0.743714	0.565375	0.5778
UNEM(-1)	-0.069153	0.029552	-2.340039	0.0292
UNEM(-2)	0.064846	0.032871	1.972764	0.0618
RGDP	0.005211	0.014105	0.369435	0.7155
FDI	-0.004853	0.009009	-0.538643	0.5958
FDI(-1)	-0.008528	0.009958	-0.856321	0.4015
FDI(-2)	0.011309	0.010717	1.055245	0.3033
INV	-0.006748	0.014430	-0.467663	0.6448
REV	-0.015746	0.010555	-1.491824	0.1506
REV(-1)	0.012523	0.012598	0.994069	0.3315
REV(-2)	0.000563	0.009259	0.060820	0.9521

R-squared	0.292987	Mean dependent var	0.069569
Adjusted R-squared	-0.043685	S.D. dependent var	0.102371
S.E. of regression	0.104583	Akaike info criterion	-1.411389
Sum squared resid	0.229689	Schwarz criterion	-0.907542

Log likelihood	33.58222	Hannan-Quinn criter.	-1.244378
F-statistic	0.870245	Durbin-Watson stat	2.386876
Prob(F-statistic)	0.573168		

APPENDIX 25
US ARDL
Step 1
Dependent Variable: UNEM
Method: ARDL
Date: 08/20/17 Time: 17:27
Sample (adjusted): 1987 2016
Included observations: 30 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): RGDP FDI INV REV
Fixed regressors: C
Number of models evalulated: 2500
Selected Model: ARDL(4, 3, 1, 4, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
UNEM(-1)	0.820690	0.281731	2.913023	0.0172
UNEM(-2)	-0.290900	0.408897	-0.711427	0.4948
UNEM(-3)	0.702487	0.576422	1.218703	0.2539
UNEM(-4)	-0.467123	0.208304	-2.242507	0.0516
RGDP	0.119196	0.161616	0.737531	0.4796
RGDP(-1)	-0.137100	0.185200	-0.740280	0.4780
RGDP(-2)	0.066459	0.124167	0.535242	0.6055
RGDP(-3)	-0.202131	0.154515	-1.308169	0.2232
FDI	0.145533	0.157031	0.926783	0.3782
FDI(-1)	-0.424904	0.235168	-1.806811	0.1043
INV	-1.283426	0.336915	-3.809348	0.0042
INV(-1)	0.788735	0.374672	2.105133	0.0646
INV(-2)	0.053821	0.487391	0.110428	0.9145
INV(-3)	0.772676	0.455504	1.696310	0.1241
INV(-4)	-0.474197	0.187024	-2.535485	0.0319
REV	0.375751	0.200102	1.877793	0.0931
REV(-1)	-0.128410	0.198463	-0.647022	0.5338
REV(-2)	-0.115635	0.179437	-0.644429	0.5354
REV(-3)	0.036230	0.180824	0.200363	0.8457
REV(-4)	0.424492	0.190813	2.224646	0.0532
C	-14.11128	22.75503	-0.620139	0.5505

R-squared	0.989034	Mean dependent var	6.009167
Adjusted R-squared	0.964664	S.D. dependent var	1.471835
S.E. of regression	0.276674	Akaike info criterion	0.464071
Sum squared resid	0.688934	Schwarz criterion	1.444909
Log likelihood	14.03894	Hannan-Quinn criter.	0.777849

F-statistic	40.58468	Durbin-Watson stat	1.888009
Prob(F-statistic)	0.000002		

*Note: p-values and any subsequent tests do not account for model selection.

Step 2: Bound Testing
ARDL Bounds Test
Date: 08/20/17 Time: 17:28
Sample: 1987 2016
Included observations: 30
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	3.441958	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.2	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

Test Equation:
Dependent Variable: D(UNEM)
Method: Least Squares
Date: 08/20/17 Time: 17:28
Sample: 1987 2016
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UNEM(-1))	0.055536	0.277110	0.200412	0.8456
D(UNEM(-2))	-0.235364	0.438390	-0.536883	0.6044
D(UNEM(-3))	0.467123	0.208304	2.242507	0.0516
D(RGDP)	0.119196	0.161616	0.737531	0.4796
D(RGDP(-1))	0.135672	0.236577	0.573479	0.5804
D(RGDP(-2))	0.202131	0.154515	1.308169	0.2232
D(FDI)	0.145533	0.157031	0.926783	0.3782
D(INV)	-1.283426	0.336915	-3.809348	0.0042
D(INV(-1))	-0.352301	0.269085	-1.309256	0.2229
D(INV(-2))	-0.298479	0.419036	-0.712299	0.4943
D(INV(-3))	0.474197	0.187024	2.535485	0.0319
D(REV)	0.375751	0.200102	1.877793	0.0931
D(REV(-1))	-0.345088	0.227294	-1.518241	0.1633

D(REV(-2))	-0.460722	0.265513	-1.735218	0.1167
D(REV(-3))	-0.424492	0.190813	-2.224646	0.0532
C	-14.11128	22.75503	-0.620139	0.5505
RGDP(-1)	-0.153576	0.460551	-0.333461	0.7464
FDI(-1)	-0.279371	0.169015	-1.652938	0.1327
INV(-1)	-0.142390	0.339719	-0.419141	0.6849
REV(-1)	0.592428	0.494542	1.197934	0.2615
UNEM(-1)	-0.234846	0.235213	-0.998439	0.3442

R-squared	0.972439	Mean dependent var	-0.070833
Adjusted R-squared	0.911193	S.D. dependent var	0.928417
S.E. of regression	0.276674	Akaike info criterion	0.464071
Sum squared resid	0.688934	Schwarz criterion	1.444909
Log likelihood	14.03894	Hannan-Quinn criter.	0.777849
F-statistic	15.87745	Durbin-Watson stat	1.888009
Prob(F-statistic)	0.000095		

Step 3: ARDL Cointegrating And Long Run Form

ARDL Cointegrating And Long Run Form
Original dep. variable: UNEM
Selected Model: ARDL(4, 3, 1, 4, 4)
Date: 08/20/17 Time: 17:28
Sample: 1983 2016
Included observations: 30

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UNEM(-1))	0.055536	0.177358	0.313131	0.7613
D(UNEM(-2))	-0.235364	0.160462	-1.466790	0.1765
D(UNEM(-3))	0.467123	0.139525	3.347951	0.0086
D(RGDP)	0.119196	0.083019	1.435768	0.1849
D(RGDP(-1))	0.135672	0.099040	1.369869	0.2039
D(RGDP(-2))	0.202131	0.076194	2.652864	0.0264
D(FDI)	0.145533	0.102676	1.417401	0.1900
D(INV)	-1.283426	0.183371	-6.999055	0.0001
D(INV(-1))	-0.352301	0.207383	-1.698791	0.1236
D(INV(-2))	-0.298479	0.175840	-1.697450	0.1238
D(INV(-3))	0.474197	0.133114	3.562348	0.0061
D(REV)	0.375751	0.096427	3.896752	0.0036
D(REV(-1))	-0.345088	0.078559	-4.392695	0.0017
D(REV(-2))	-0.460722	0.122302	-3.767097	0.0044
D(REV(-3))	-0.424492	0.104953	-4.044583	0.0029
CointEq(-1)	-0.234846	0.041435	-5.667886	0.0003

Cointeq = UNEM - (-0.6539*RGDP -1.1896*FDI -0.6063*INV + 2.5226*REV -60.0874)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP	-0.653942	2.517425	-0.259766	0.8009
FDI	-1.189592	1.743810	-0.682180	0.5123
INV	-0.606314	0.947650	-0.639807	0.5382
REV	2.522623	4.450393	0.566832	0.5847
C	-60.087363	153.085318	-0.392509	0.7038

Autocorrelation

Date: 08/20/17 Time: 17:29

Sample: 1983 2016

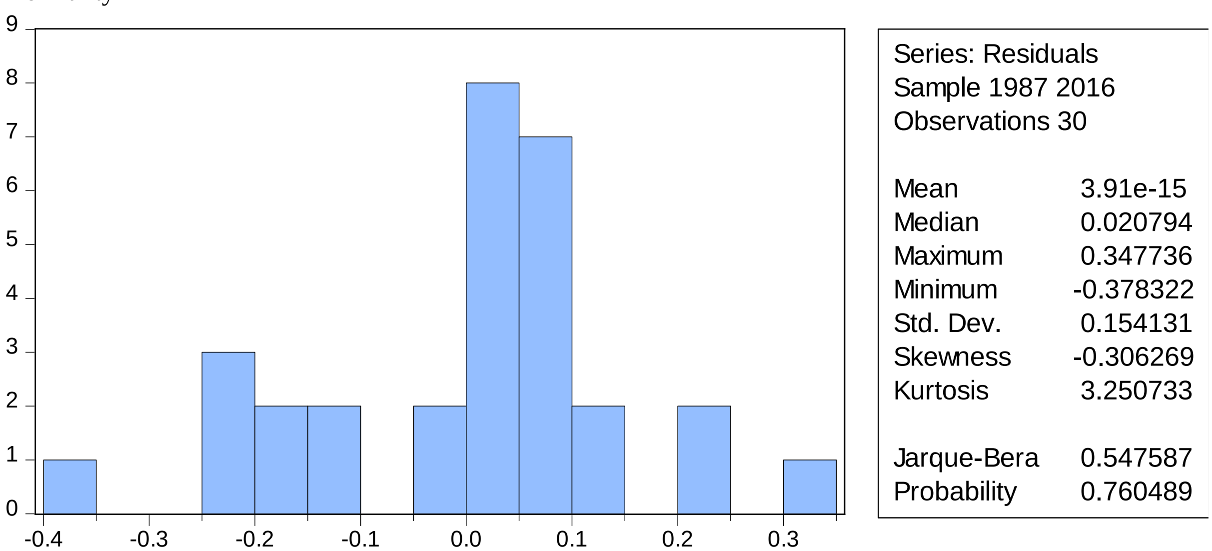
Included observations: 30

Q-statistic probabilities adjusted for 4 dynamic regressors

<table>
<tr><th>Autocorrelation</th><th>Partial Correlation</th><th></th><th>AC</th><th>PAC</th><th>Q-Stat</th><th>Prob*</th></tr>
<tr><td>. | . |</td><td>. | . |</td><td>1</td><td>0.045</td><td>0.045</td><td>0.0664</td><td>0.797</td></tr>
<tr><td>***| . |</td><td>***| . |</td><td>2</td><td>-0.349</td><td>-0.351</td><td>4.2341</td><td>0.120</td></tr>
<tr><td>. *| . |</td><td>. *| . |</td><td>3</td><td>-0.184</td><td>-0.168</td><td>5.4376</td><td>0.142</td></tr>
<tr><td>. *| . |</td><td>.**| . |</td><td>4</td><td>-0.129</td><td>-0.282</td><td>6.0492</td><td>0.196</td></tr>
</table>

*Probabilities may not be valid for this equation specification.

Normality



Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.382901	Prob. F(20,9)	0.9646

Obs*R-squared	13.79158	Prob. Chi-Square(20)	0.8409
Scaled explained SS	1.396852	Prob. Chi-Square(20)	1.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 08/20/17 Time: 17:29
Sample: 1987 2016
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.467502	3.802571	-0.385924	0.7085
UNEM(-1)	0.016478	0.047080	0.349998	0.7344
UNEM(-2)	-0.048108	0.068330	-0.704055	0.4992
UNEM(-3)	0.082477	0.096325	0.856229	0.4141
UNEM(-4)	-0.040034	0.034809	-1.150090	0.2797
RGDP	0.008304	0.027007	0.307475	0.7655
RGDP(-1)	0.002035	0.030949	0.065742	0.9490
RGDP(-2)	-0.016479	0.020749	-0.794197	0.4475
RGDP(-3)	-0.000137	0.025821	-0.005314	0.9959
FDI	-0.004469	0.026241	-0.170311	0.8685
FDI(-1)	-0.017310	0.039299	-0.440469	0.6700
INV	-0.040074	0.056302	-0.711780	0.4946
INV(-1)	0.036918	0.062611	0.589641	0.5699
INV(-2)	-0.000240	0.081447	-0.002951	0.9977
INV(-3)	0.028781	0.076119	0.378107	0.7141
INV(-4)	-0.025007	0.031253	-0.800148	0.4442
REV	0.023537	0.033439	0.703890	0.4993
REV(-1)	0.002968	0.033165	0.089485	0.9307
REV(-2)	-0.006930	0.029986	-0.231115	0.8224
REV(-3)	0.009666	0.030217	0.319887	0.7564
REV(-4)	0.015917	0.031887	0.499171	0.6296

R-squared	0.459719	Mean dependent var	0.022964
Adjusted R-squared	-0.740904	S.D. dependent var	0.035041
S.E. of regression	0.046235	Akaike info criterion	-3.114147
Sum squared resid	0.019239	Schwarz criterion	-2.133309
Log likelihood	67.71220	Hannan-Quinn criter.	-2.800368
F-statistic	0.382901	Durbin-Watson stat	2.369058
Prob(F-statistic)	0.964608		