IS THERE AN INVERSE-U RELATIONSHIP BETWEEN FINANCIALISATION AND INVESTMENT? SOUTH AFRICA'S STOCK MARKET CAPITALISATION IN COMPARATIVE PERSPECTIVE.

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Abstract

In recent decades, the growth and fluctuations in the financial sector have become increasingly disjointed from events in the real economy. There has been a dramatic increase in global market integration and globalisation since the 2008 financial crisis. The argument presented in the thesis shows perspective from the two general debates in Economics. The Orthodox view, which suggests there is an efficient flow of resources between people and institutions over time, supports the argument that there is a positive relationship between financialisation and economic growth. Alternatively, the Heterodox view argues that financial liberalisation fails to anticipate market effects and requires intervention in order to limit negative consequences. More recent studies have proposed an inverse-U theory between financialisation and investment, which suggests that there is a threshold, above which further financial development and financial globalisation has detrimental effects on the real economy. With South Africa being a developing country that is highly reliant on capital inflows to finance the economy, there is space for more acute research to investigate whether South Africa has surpassed this threshold. This study focusses on one aspect of this relationship, namely the relationship between Stock Market Capitalisation and Investment. It uses panel data analysis and other methods to explore whether such an inverse-U relationship exists internationally, and whether South Africa is suffering from the effects of financialisation.

JEL Classification: E5, F6, G000, G010

Keywords: Monetary Policy, Flow of funds, Globalisation, Financial Development, Financial Economics

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Chapter 1 – Introduction

"The only constant in life is change" – Heraclitis. This quote by the Greek Philosopher Heraclitus rings true to the study of economics as every economy continuously changes and experiences phases of increasing and decreasing economic growth (Guru and Yadav, 2019).

1.1 Context

Throughout many countries, there has been a general agreement that the processes of investment and economic growth are highly interconnected. Neoclassical and Marxist economists have even placed investment as the main driving force of economic growth (Anwer and Sampath, 1999).

Investment spending in the global economy makes one of the most direct contributions to GDP. Investment plays a vital role in both the short- and long-term aspects of the economy, essentially linking the present with the future (Ahmad, Luqman and Hayat, 2012). In South Africa, the level of private sector investment is about 20 percent lower than the levels which were present pre-2008 Global Financial Crisis (Viegi and Dadam, 2018).

In the last few decades, the economies of the world have undergone drastic transformations and developments. The phenomenon of financialisation has been growing along with the pace of activities in the markets. For a country like South Africa, a large portion of the increases in financialisation can be attributed to non-financial companies (NFC's) (Karwowski, 2017). Looking back to the 1970s, there is evidence that South African NFC's have drastically changed their financial operations. Historically, NFC's used to finance their capital investment needs internally, therefore reducing the need for any external finance (Karwowski, 2017). Since the early 2000's, however, the rising financialisation caused firms to look for external sources of capital in order to finance their investment needs (Karwowski, 2017). So-called stock market capitalism emphasises the role of stock markets as the primary channel for allocating savings to investment. Growing stock markets are regarded as beneficial.

Households put their savings into stocks, and firms use the capital raised to invest in equipment which generates growth. This highlights that there is less need for other channels of finance (banks, retained earnings etc.). In particular, there is less need for the State to drive investment, because the assumption is that the market will do it. Many firms are listed on the Johannesburg Stock

Exchange (JSE), as it is seen as a good way to raise capital and can also be used to raise capital with a short notice period (Dixon and Radford, 2020).

This increase in financialisation and capital flows has led to financialisation being seen as problematic in many emerging markets (Karwowski, 2017). Financialisation has been made possible by a series of measures aimed at deregulating the financial sector and liberalising capital flows internationally. The earlier point regarding South African NFC's rings true in the global context as well. There is thus an argument in favour of financial development worldwide (Stockhammer, 2010). The argument is that financial development will allow capital to be allocated to its most efficient use (Stockhammer, 2010).

It is clear that financial development and investment both affect economic growth. This gives rise to the debate of whether financialisation has a positive or negative impact on investment (Dutta and Roy, 2009). The debate over the net effect of financialisation can be split into the two world views in economics, which are the Orthodox and Heterodox views.

The Orthodox way of thinking supports financial liberalisation. Conventional literature suggests that financial markets facilitate the financing and efficient allocation of investment. In recent times, the global financial markets have grown in absolute terms. With globalisation and financial development growing at a rapid pace, resulting in rising capital flows into emerging market economies, there is an increase in investment levels (Chen, Mrkaic and Nabar, 2019). The increase in flows has many benefits to the economy as there is now a larger pool of capital for businesses, thus allowing existing businesses to expand and new businesses to emerge. The inflow of capital has a 'trickle-down effect' as the expansion and development of new businesses decreases unemployment, raises the economic growth levels of the economy, as well as increases sustainable economic development.

South Africa has been dominated by the Orthodox way of thinking since the emergence of democracy (Fryer, 2016). South Africa relies upon access to the pools of cheap capital, accompanied by the view that financial markets are largely efficient in the long-run. The development of the financial sector is therefore seen as a way to enrich the economy and achieve economic growth goals (Fitzgerald, 2006). According to this view, there is a positive relationship between financial sector development and economic growth (Abel, Nyamutowa, Mutonhori and Le Roux, 2019). This relationship is evident in the strengthening of competition and stimulating of innovation within South Africa, which is promoting economic growth. (Abel *et al,* 2019).

In contrast to the positive outcomes are the possible negative aspects that could arise from the increase in financialisation. Heterodox economists argue that there are negative consequences to liberalisation and that too much financialisation can be 'parasitic' to the economy (Pettinger, 2018).

Two of the prevalent consequences in emerging market economies are the increased market volatility and sectoral imbalances caused by financialisation. The Heterodox argument supports the 'Keynesian' school of thought as there is a need for government intervention due to the inefficiencies that arise as a result of market frictions. This view believes that the effects of globalisation and financial development do not lead to the predicted increases in investment and economic growth (Thomson and Dutta, 2015). The rise in financialisation and market integration gives investors more power as a hasty inflow of capital into a market can cause a financial bubble, while a rapid outflow of capital can cause an economic crisis. Therefore, the volatility of the markets, due to the increased integration and financialisation, is a major concern for economies that rely heavily on investment as a source of finance, such as South Africa (Thomson and Dutta, 2015).

There is a regulatory and developmental role for the State in order to attempt to reduce the inefficiencies in the economy. This puts forward the idea that there is a disconnect between financial market participants and the underlying economy. The disconnection can occur in different aspects of the market. For example, according to Iacuri (2020) the US economy is currently in a recession, however, the stock market has recovered remarkably based off of investor confidence about the future of the economy. Additional evidence is provided by Kabundi, Loate and Viegi (2020) who show that before the financial crisis, US monetary policy had a positive effect on the economy by expanding global demand. After the financial crisis, however, the policy had a negative effect on industrial production and credit, highlighting the issues in the real sector (Kabundi, Loate and Viegi, 2020). The study conducted by Rey (2015) highlights the disconnect as the global financial flows transmit the US monetary policies across the world. The exchange rate policies in place which attempt to protect the economies of the world from shocks prove, however, to be ineffective (Kabundi *et al*, 2020). This gives evidence that international capital flows are potentially destabilising to the economy.

Epstein and Crotty (2013) suggest that the financial sector has become 'too big', which means it has reached a size where it begins to provide friction on the development and growth of the real sector (Sawyer, 2017). The idea put forward is that although financial development is needed for growth, this will be unlikely to have a monotonic relationship with growth (Moosa, 2016). The positive and negative aspects leave room for the debate as to whether financialisation has a net positive or negative effect on the economy and investment. Many economists are now proposing the idea that there is an inverse-U relationship between financialisation and investment, meaning that financial development increases investment up until a certain point and, upon reaching this point, further financialisation begins to harm the economy (Tori and Onaran, 2015).

1.2 Goals

The goal of the research is to investigate South Africa's financialisation and whether this is detrimental to investment. In order to achieve the main goal, the research is split into various sub-goals:

- To explore the measures of financialisation and to assess the degree to which South Africa is financialised in a comparative perspective.
- To empirically test the claimed inverse-U relationship between financialisation and economic performance at the global level.
- To assess the implications for South Africa of the empirical findings regarding the inverse-U relationship.

In order to further investigate financial development, this study uses Stock Market Capitalisation as a percentage of GDP as a proxy for financial development. In the context of this research, market capitalisation (also known as market value) is the share price multiplied by the number of shares outstanding (including their several classes) for listed domestic companies (The Global Economy, 2020). Stock Market Capitalisation as a percentage of GDP is also known as the 'Buffet indicator' as Warren Buffet commented on this variable saying that this was the best single measure where valuations stand at any given moment (Roberts, 2020).

1.3 Method

The first sub-goal will be explored using a literature review. In order to achieve the second sub-goal, multivariate regression analysis will be conducted on a panel of 41 countries over a 16-year time period using annual data. The dependent variable will be investment, which is measured as a percentage of GDP. The independent variables will be split into variables acting as a proxy for financial development and control variables. The third sub-goal will be achieved by assessing the result of the previous tests and understanding the implications in a South African context.

1.4 Chapter Outline

The thesis proceeds as follows: Chapter 2 is a literature study that forms the development of the argument, beginning with the Orthodox vs Heterodox debates, leading toward the idea of an inverse-U relationship between investment and financialisation; Chapter 3 sets out the empirical methodology implemented in order to achieve the goals of the research; Chapter 4 presents and interprets the results of the study; and finally, Chapter 5 concludes the study.

Chapter 2 – Literature Review

2.1 Introduction

The global financial markets are constantly changing in order to keep up to date with current times. Financialisation and globalisation have changed the way we view and analyse markets. With firms now having access to larger pools of capital, as a result of market integration, there is a need to identify the effects of financialisation on investment. The level of investment in an economy has major impacts on the growth of the economy, as well as the way of life of the people within the economy. Investment is a significant factor in the short- and long-run growth of any economy (Ahmad, Luqman and Hayat, 2012). The dominant view in the economics literature is that financial development will increase investment and hence economic growth. Recent literature has found that this relationship may not be a positive linear relationship and has allowed room for more acute research into this topic. This gives rise to an idea of an inverse-U relationship between financialisation and investment

The focal point of this chapter is addressing the first goal as set out in Chapter 1, which is to explore the measures of financialisation and to assess the degree to which South Africa is financialised in a comparative perspective. The literature review conducted in this chapter will pave the way forward for the rest of the study.

2.2 Orthodox vs Heterodox views

> Policy-makers concerned about growth and inequality can be spooked by such paralysing analyses, leading them to hand total control of monetary policy to an independent central bank, to reject any activist role for fiscal policy, and to funnel all attention on reducing public debt to the almost total exclusion of growth-enhancing public investments. That appears to have been what happened under the African National Congress (ANC) in South Africa since 1990. It is time for some degree of pragmatic rebalancing (Padayachee, 2018: 5).

As financialisation is one of the key components to modern globalisation, the two are intrinsically linked and this can be seen as a destabilising force. Finance is often destabilising as it is based on a future that is uncertain. Finance can easily lead the global economy to a devastating end as the increase in financial globalisation and integration can bring the market down like a 'house of cards' and therefore needs to be carefully monitored (Polychroniou, 2017). However, finance has proven to be needed for economic growth in a country, and a positive relationship between investment and economic growth is generally found. Stock markets are expected to accelerate growth by providing a boost to savings, which in turn increases the levels and quality of investment (Yartey and Adjasi, 2007:4). By doing this, there is also an avenue created for growing companies to raise capital at lower costs (Yartey and Adjasi, 2007:3).

However, there is a wide array of evidence to suggest that too much finance can damage the economy, impede poverty alleviation and exacerbate income inequality (Tyson and Beck, 2018). Financialisation is one of the dominant forces in the market, and there is still confusion about its nature and dynamic (Polychroniou, 2017). Polychroniou (2017) conducted an interview with Gerald Epstein, a leading authority on financialisation, and drew some interesting conclusions. Epstein defined financialisation as "The increasing role of financial motives, financial markets, financial actors and financial institutions in the operation of the domestic and international economies" (Polychroniou, 2017). Financialisation is a vital phenomenon having major impacts on the economy. Whether financialisation has an expanding or contracting effect on an economy depends on three key channels that have been identified. These channels are: what are the objectives and restrictions that finance will place on the way a firm operates; new opportunities for wealth-based and debt-based consumption and; the distribution of income and wealth between capital and labour (Polychroniou, 2017). The need to determine the most effective level of financial development for an economy gives rise to the common debate regarding the two world views in economics, namely the Orthodox and Heterodox views.

2.2.1 Orthodox

The Orthodox argument is considered the 'dominant way of thinking' and has been used in everyday economics. It tends to present itself as 'consensus' and 'synthesis' (Spiegler and Milberg, 2013). Essentially, the overall logic for Orthodoxy is that the market will produce the optimal outcome with regards to the quantity and direction of investment without large scale state intervention.

Stock markets are believed to be an indicator of financial health of an economy and is an important ingredient for economic growth (Tachiwou, 2010: 97). The primary function of stock markets is transforming savings into financing for the real sector. With this, there is an increase in the efficiency of the financial system, as the stock markets accelerate growth by boosting domestic saving while increasing the quality and quantity of investment (El-Wassal, 2013). Stock Market Capitalisation is one of the most commonly used indicators of financial market development. There has been evidence that since the 1990's, Stock Market Capitalisation has been increasing at a drastic pace, especially in developing countries (Bayraktar, 2014:77). Effective financial markets are considered to be one of the most important factors for economic development and growth, both in developing and developed countries. Given the high importance of the financial markets, there is evidence of a link between financial development and economic development (Bayraktar, 2014:82).

More recent studies have identified two factors that contribute to the development of the stock markets, these are 'macroeconomic factors' and 'institutional factors'. Macroeconomic factors are aimed more at the level of economic development, capital flows and inflation, whereas institutional factors are aimed more at legal frameworks (El-Wassal, 2013). Most research and views analyse the macroeconomic standpoint as this can have greater effects on the markets in a shorter time frame.

Therefore, from the macroeconomic standpoint, there are various indicators of stock market development, such as the level of stock market liquidity. Higher liquidity generally means higher development as this indicates how quickly funds can be transferred between buyers and sellers in a market, therefore increasing trade volumes (Bayraktar, 2014:77). The most commonly identified factors which contribute to the rising Stock Market Capitalisation are financial openness and liberalisation. These two factors increase stock market activity at a rapid pace. The increasing financial liberalisation results in rising globalisation and financialisation. This allows for larger capital flows into the economy with the global markets being so intertwined. These flows can allow access to foreign saving and potentially promote investment, economic growth and reduction of poverty (FitzGerald, 2006:1).

The increases in Stock Market Capitalisation are supported by Orthodox arguments, which is dominated by support for financialisation and market liberalisation on the one hand, and a small state with a balanced fiscus and an inflation targeting monetary policy on the other. Financial liberalisation reflects an increasing use of financial intermediation by savers and investors, which Orthodox economists argue allows an efficient flow of resources between people and institutions over periods of time. The idea behind the Orthodox theory is well explained by the metaphor of the 'invisible hand' coined by Adam Smith in the 18th century (Heath, 2008). The 'invisible hand' paradigm suggests that there are beneficial social and economic outcomes that can be achieved from the actions of individuals with regards to their own self-interests (Heath, 2008). The support to this claim by Heath (2008) is based on the belief that as individuals attempt to acquire wealth and increase their financial position, they will employ more people and create jobs in an effort to pursue their own personal interests. By creating jobs and increasing growth in the economy, they are essentially being led by an 'invisible hand'.

This theory supports the classical theory of economics and inherently suggests that markets will self-correct with regards to low levels of investment. It is thus believed that deregulation is beneficial to an economy. Financial development, in this view, leads to lower costs of capital, increased specialisation, innovation and competition (Abel *et al,* 2019). However, it is important to note that this does not mean that there is no role for regulation. An example of such regulation is the Basel Accords, which aim to ensure there is enough capital on account for financial institutions to meet obligations, avoid unexpected large losses and basically prevent market failures (Masood and Fry, 2012).

Viewed as one of the greatest economic achievements was the implementation of the 'New Monetary Consensus' (NMC) view in macroeconomics. The NMC theory is a rejection of the quantity of money theory and focuses on returning to the 'Wicksellian' idea of eliminating high levels of inflation by adjusting nominal interest rates to change the price level (Fontana, 2006).

The New Monetary Consensus (NMC) idea is based around inflation rates, therefore promoting the idea of the inflation targeting framework. The New Consensus is viewed as a modified version of the old 'Neoclassical synthesis between real and monetary sectors'. This theory restored the most extreme version of Neoclassical economics and merged the idea of continual market clearing and rational expectations (Wray, 2011). This allows non-random policies to have zero effects as all agents involved in the market can immediately figure out what policy makers are trying to achieve and adjust their own behaviour in the most efficient manner possible (Wray, 2011). The movement towards this theory emerged in the 1990's in New Zealand and Canada and has since been implemented worldwide, with South Africa and other emerging market economies adopting the policy (Fontana, 2006).

The NMC places monetary policy at the forefront in achieving goals of the economy and has placed fiscal policy as a secondary importance in this regard. Although fiscal policy is of a secondary importance, as private markets provide adequate savings and investments, there is still a need for the State to provide basic infrastructure and remain in a supporting role for the markets. Therefore, the idea of fiscal policy is not to change the economy directly, but more for the State to act as a supporting role for the market. Under this consensus, the policy does not act directly but rather indirectly through its influence on market expectations (Benzinga, 2011). The 'consensus' idea is that inflation slows growth and must therefore be controlled and restricted. The expectations are that if inflation is kept down, growth will prosper (Benzinga, 2011). Therefore, the NMC is largely based on expectations. The expectations will thus determine actual inflation, but it is only the members of the public who have the ability to influence inflation according to the expectations (Benzinga, 2011).

While implementing a monetary policy cannot alone take the responsibility of restoring a distorted and declining economy, it does play an extremely important role in this regard (Bhorat and Hirsch, 2016). Differences in methods of implementation arise from differences in the economy, such as in developing economies there is a lack of confidence in central banking systems, there is less exchange rate stability and less efficient debt servicing by the government (Bhorat and Hirsch, 2016). It is evidenced that South Africa may not be subject to all the constraints listed above, however, we as a Nation are subject to some, which is enough to weaken the economy severely. The main goal of monetary policy in South Africa is to achieve and maintain price stability in interest rates as well as to create a platform for economic growth and development within the country (South African Reserve Bank, 2018). If correctly implemented, an inflation targeting approach looks like a target path for a competitive price level (William, 2003:1). There are many economists advising that a policy of inflation targeting contributes heavily towards economic stability, which in turn encourages savings, investment, economic growth and all-round international development and competitiveness (Pettinger, 2018). With the inflation rate being kept low, there will be an increase in investor confidence which will lead to increased productive capacity. This, in turn, will increase the growth and employment within the economy (Pettinger, 2018). With the markets presumed to be efficient, the need of monetary policy is to stabilise the monetary side of the economy, therefore keeping inflation in check. With regards to any role that the State may undertake, the possibility of corruption emerges as private individuals can use public office for personal gain (Siddiqui, 2019). However, with the role of the State being limited in an economy aiming for financial liberalisation, the chances for corruption are decreased (Mauro, 1997).

Over the last decade, the financial sector has drastically increased the frequency and pace of activities, along with the growth in financial development which is disjointed to the real economy. Contemporary Capitalism revolves around Neoliberalism, globalisation and financialisation, with significant focus being placed on the latter two (Polychroniou, 2017). With the increase in globalisation, there is evidence that emerging markets are recording higher income per capita. The levels are still not near those of the richest countries in the world, however, the gap has been significantly reduced. According to this school of thought, the increased growth in the global markets has developed from the increased integration of the global economy in the 1980s (Polychroniou, 2017). With this step, there has been increasing deregulation and broad integration among a wide array of countries. According to George Packer, it was viewed that "Rejecting globalisation was like rejecting the sunrise" (Saval, 2017).

There are numerous benefits that arise from the increasing globalisation that is present in today's economy such as increased foreign direct investment as a result of increased market integration, specifically into emerging market economies. The increase in trade flows and investment between countries is a result of technological innovation in order to ease transactions between countries and economies. Financial liberalisation allows access to foreign savings in excess of domestic savings, and with this increase in investment over and above the expected levels, there is an increase in the ability to finance economic growth (Masci, 2008). Financial development involves the establishment and expansion of institutions which promote investment, economic growth and a reduction of poverty (Chen, Mrkaic and Nabar, 2019). This promotion of investment and economic growth ties in with Adam Smith's argument stated earlier regarding the 'invisible hand'. There is thus a positive relationship between financial development and economic growth, and there is a strong move in the mindset of organisations towards economic growth (FitzGerald, 2006:1). A result from the increased investment is economies of scale which allows larger companies to reduce costs and prices, as well as increases the ease of raising capital as there is a wider array of investors. Therefore, it was believed that financial development fosters portfolio diversification, which accordingly reduces risk for investors while increasing returns (FitzGerald, 2006:4).

Orthodox economists do admit that financial markets are imperfect and experience volatility, such as consumption and stock market volatility. However, there is the belief that through risk sharing opportunities that arise from increased financial liberalisation, consumption volatility is decreased (Levchenko, 2005). Furthermore, it is believed that stock market volatility is also expected to decrease from financial liberalisation, as it causes financial deepening which is associated with increased numbers of investors and shares, which should decrease the volatility through the increased opportunities (Grabel, 1995). A severe progression of any of the risks associated with the Orthodox view could decrease financial sentiment, cause portfolio reallocations, or cause a widespread tightening of monetary and fiscal policies. These would result in a weakening of manufacturing and other services and lead to a slowdown of economic growth (IMF, 2020). Therefore, there are clearly negative aspects to financialisation, however, there is the overarching belief that the positive aspects of financial development outweigh the negative, resulting in a net benefit to the economy.

2.2.2 Heterodox

With capital flows ever-increasing, there is a need to take a deeper look at the risks and returns associated with these flows and how they could lead to, or prevent, the appearance of asset bubbles. The use of financial instruments, which are assets that can be traded, such as equity on the stock markets, has grown in importance over recent decades. These are used to keep the pace of economic growth going in an upwards trajectory and if these instruments are not used effectively, there can be negative consequences such as macroeconomic and financial distress (Munoz, 2011).

The Heterodox view is based on the 'Keynesian argument' that calls for increased government intervention due to inefficiencies that arise as a result of market frictions. These views were completely written-off in the 1980s to the 1990s, as the argument of these policies was believed to be irrelevant. However, many economists have found that there is a place for Heterodox views in the current economy as its ideas and values still contribute positively to the communication and development of economic concepts (Hein and Truger, 2007). This view argues that the global financial crisis only showed that there is very little that is settled in the macroeconomic world and that the debates of Keynesians and monetarists are still very relevant in today's world (Blinder, 2015).

The essential element of the Keynesian economics argument is that, from a macroeconomic standpoint, there can be disequilibrium over extended periods of time. The Keynesian argument provides motivation for increased government intervention in the way of spending in order to help an economy recover from times of poor performance (Pettinger, 2018). The theoretical foundations of a State-led economic policy framework lie in what Padayachee (2018:9) classifies as a structuralist approach to economic policies in order to address the recognised key shortfalls of under-full employment equilibrium and demand failures. The classical or Orthodox theory of economics essentially suggests that markets will self-correct. Keynes's theory, however, states that this is a highly unlikely phenomenon and that government intervention is required as there are too many factors that influence market self-correction, most commonly the 'liquidity trap' and the 'general glut of savings' (Pettinger, 2018).

In the transition to a democracy in South Africa, the idea was put forward to create State-led investment aimed directly at promoting economic growth and employment and at reversing the racial and class inequality still prominent within the Nation (Padayachee, 2018:9). In contrast to the classical argument that increased government spending would crowd out private sector investment, MERG, the African National Congress's macroeconomic policy research institute, had envisioned a two-phase crowding in approach which was aimed at focusing on housing, education, health and physical infrastructure as ways to drive up investment (Padayachee, 2018:10). MERG undoubtedly advocated for State intervention in order to achieve optimal economic growth and thus opted for a more Keynesian approach to economics.

Further supporting the Keynes argument that interference is required is the 'paradox of thrift', which suggests that in a recession, people are going to behave rationally (Pettinger, 2018). Being a rational investor in times of recession, raises the fear of investors which will result in an increase in savings and a decrease in spending and investment (Pettinger, 2018). Keynes believed that investment is highly volatile and moves in line with GDP growth. Therefore, if the GDP decreases then the investment in the private sector would move in the same direction (Pettinger, 2018). The intervention of government spending would, however, increase this growth rate and thus support investment (Pettinger, 2018). There are mass amounts of evidence from various papers that suggest that at the centre of rapid economic development is the process of structural transformation, which is essentially the aggregating and channeling of fixed investment towards higher value-add activities (Zalk, 2018).

The argument has been developed that conventional views fail to anticipate the effects of financial liberalisation. With increased financial liberalisation, there is an over-reliance on the actions, behaviours and relationships of other countries. If one inter-country relationship fails or is terminated then this will have a trickle-down effect into many other inter-linked countries (IMF, 2020). An example of this in recent times is the growth of trade and a large portion of global growth is dependent on the escalation of the US-China trade tensions. A breakdown of this trade connection would result in a disintegration of a wide range of technology supply chains, as well as other products, which would, in turn, cause a ripple effect throughout the entire global market (IMF, 2020). Financial liberalisation therefore ignores interactions between foreign and domestic debt by assuming that domestic debt would be enforced even if this is not the case for foreign debt. The main problem with this is that it will affect both foreign and domestic debt, as well as cause domestic savers to send their savings offshore (Broner and Ventura, 2011:4). As a result, financial liberalisation might decrease domestic sources of funding and this will lead to higher capital exports and slowed down economic growth (Broner and Ventura, 2011:4). Agreeing with Broner and Ventura (2011) is Masci (2008), who argues that financial liberalisation favours excessive borrowing at the corporate and government levels, which causes an overvalued and unsustainable exchange rate. This leads to unfavourable effects, such as excessive borrowing that will have to be repaid at a devalued exchange rate in the future.

Additionally, the overvaluation brings to light the issue of 'Dutch Disease' (Masci, 2008). 'Dutch Disease' is defined as, "the chronic or permanent overvaluation of a country's exchange rate caused by Ricardian rents arising from abundant and cheap resources, whose production is compatible with a current-equilibrium exchange rate that is clearly more appreciated than the industrial-equilibrium exchange rate". Therefore, 'Dutch Disease' is a problem that has been around for decades, and it is a market failure that overvalues the exchange rate (Bresser-Pereira, 2012:353). In developing countries, this market failure is a major obstacle for industrialisation, which the developing economies did not take into account (Bresser-Pereira, 2012:353). The severity of the 'Dutch Disease' is determined by the difference between the industrial equilibrium exchange rates and the current equilibrium exchange rates. The larger the difference, the more severe the disease (Bresser-Pereira, 2012:354). The way to eradicate this is to have policies in place to manage exchange rates in order to keep it competitive (Bresser-Pereira, 2012:354).

Accordingly, the paper by Broner and Ventura (2011:3) suggests that capital controls may be needed, as private incentives to borrow from abroad are too high and private incentives to lend domestically are too low. Although Orthodox economists strongly oppose capital controls, Padayachee (2018:21) believes there is a need for the implementation of such controls, even if for a limited time frame, in order to enhance the South African Reserve Banks' capacity to monitor capital flows.

The point is also made that some countries are 'better off' postponing financial liberalisation. This is in contrast with that which the Orthodox theory promotes, which is that poorer countries will benefit from financial liberalisation even if it has domestic financial disruptions (Broner and Ventura, 2011:3). The benefit of postponement arises because the markets are not sufficiently developed, therefore lower middle-income countries will be in a more desirable or advantageous position by waiting until their domestic markets have become stronger and more developed (Broner and Ventura, 2011:3). Karwowski (2017) has made the claim that financialisation should be identified as problematic in rich countries and even more so for developing countries such as South Africa. However, there is evidence that financialisation is more likely to benefit the richer countries, all while harming the poorer societies.

Rodrik and Subramanian (2009:114), as well as Broner and Ventura (2011), agree that with an increase in financial globalisation, volatility actually rises in emerging market economies. The view is that the capital inflows exacerbate the investment constraint faced by most developing countries by appreciating the real exchange rate. The appreciation of the home currency, which arises from capital inflows, reduces the profitability of investment and decreases the private sectors' willingness to invest (Rodrik and Subramanian, 2009:115). Rodrik and Subramanian's view that financial globalisation actually reduces growth (Rodrik and Subramanian, 2009:115) supports Keynes's view that intervention in the form of government spending would increase economic growth and thus support investment (Pettinger, 2018).

Epstein and Crotty (2013) suggest that the financial sector has become 'too big', which means it has reached a size where it begins to provide friction on the development and growth of the real sector (Sawyer, 2017). This suggests that although financial development is needed for growth, financialisation will be unlikely to have a monotonic relationship with growth (Moosa, 2016). There is, therefore, a need for an optimal mix of financial development and financial openness that will result in the most efficient performance in the economy.

An important argument is that countries that are experiencing low levels of financial development benefit from increased financial development up until a certain threshold. Upon reaching this threshold, further financialisation can be detrimental to the economy (Cecchetti and Kharroubi, 2012). Therefore, too much financial liberalisation results in excessive capital flows which can be "parasitic" to an economy (Pettinger, 2018). The Heterodox view argues that, "the positive aspects do not outweigh the negative aspects" (Fitzgerald, 2006:22). This view believes that the effects of globalisation and financial development do not lead to the predicted increases in investment and economic growth. There is a regulatory and developmental role for the State to attempt to reduce inefficiencies in the economy.

The recent political and social events resulting from the Covid-19 virus could shift the focus of new investments away from the anarchy of liberal capitalism towards investing in more items of domestic importance and national security concerns (Gossel and Koelble, 2020). The current panic in the markets could result in the high risk of liquidation in the global market, which severely effects financial liquidity. The global shock of 2020 caused a massive outflow of capital which was followed by a subsequent recovery in inflows into emerging markets (Ribakova, Hilgenstock and Fortun, 2020). The movements of the markets are similar to those of the financial crash in 2008, which were some of the darkest days in the financial sphere. However, the recovery is not believed to return the markets to original levels, highlighting the significant issues that developing countries are facing in an increasingly financialised world (Ribakova, Hilgenstock and Fortun, 2020). This has opened space for more acute research into identifying and addressing the underlying issues.

2.3 U-Shaped Theory

There are financial liberalisation programmes throughout most of Africa that are aimed at stock market development. The drive towards the development of stock markets over the last few decades are highly linked to the global economy. The financial markets have advanced and become highly integrated, and this has resulted in many emerging markets implementing a progressive deregulation of domestic and international markets. Internationalisation of these markets has increased the roles of new 'players' in the financial markets (Yartey and Adjasi, 2007:3)

There is an ongoing debate as to the impact of investment flows on economic growth (Abdul Bahri, Md Nor, Sarmidi and Mohd Nor, 2019). Although literature has generally found that there is a positive relationship between financial development and economic growth, this matter is up for debate as Ly-Dai (2018) and authors Gourinchas and Jeanne (2013) found that an economy growing faster tends to receive fewer capital inflows compared to a country that is weaker, an outcome known as the 'Allocation Puzzle'. The capital flowing into less developed countries will possibly yield higher returns as there is more room for the economies to grow. Given the host country's policies and current level of development, the capital inflows will trigger increased technological advancements, human capital formation, international integration and help the economy become more advanced and developed (OECD, 2002). There are negative aspects to this. The profits generated as a result are often repatriated, the local community is only developing off of the income from foreign sources and once the less developing economy becomes developed, the capital inflows will decrease. Therefore, the economy is no longer an untapped source of profits for foreign investors, leaving the economy with a deteriorated balance of payments (OECD, 2002).

Policy makers have claimed that having foreign direct investment into the country is essential, especially in developing countries (Abdul *et al*, 2019). Economic theory suggests that capital should flow from 'richer' to 'poorer' countries, however, since rapid expansion of financialisation, there has been evidence of a 'paradox' that capital is actually flowing from the 'poorer' countries to the 'richer' countries (Prasad, Rajan and Subramanian, 2006). The stronger the level of financial development, the more foreign direct investment promotes growth, all depending on the absorptive capacity (Abdul *et al*, 2019). The inflows into the countries with higher levels of financial development are utilised more productively due to the availability of low-cost but high-end human capital skills (Fu, 2008). Another reason for the favorable flow to higher financially developed countries is the spillovers in the countries will be utilised more effectively with the ability for innovation and performance by the local firms and businesses. These spillovers include knowledge transfers as well as capital spillovers (Fu, 2008).

Prasad, Rajan and Subramanian (2006) suggest that as cross-border capital flows have increased as a result of increased global market integration, the paradox has worsened, harming developing countries, while the developed countries reap the benefits. Ly-Dai (2016) provides evidence of an inverted U-shape of capital flows. There is an idea that inflows of capital may either increase or decrease the economy, depending on the level of financial development (Abdul *et al*, 2019). The

2008 financial crisis made it clear that there is no linear relationship between financialisation and economic growth, and that there is much to be discovered about this relationship (Polychroniou, 2017).

Sawyer (2017), Ly-Dai (2016) and Polychroniou (2017) acknowledge the evidence that supports an inverted-U shaped theory in many countries, majority of which are developing and are lying on the negatively sloped portion of the curve, as the financial sector pulls talented and highly educated employees away from the sectors that may contribute to economic growth and productivity (because of higher pay levels). Cecchetti and Kharroubi (2012) conclude that the size of the financial sector has an inverted-U shaped relationship with productivity growth and that at some point, the excessive increases in the financial sector will lead to negative growth of the economy. This could arise from what is known as 'investor myopia'. This is when a stock market is so liquid that investors can easily sell their shares, basically this discourages investors from making long term commitments which can have severe ramifications for economic growth (Yartey and Adjasi, 2007:3). Supporting the conclusions made by Cecchetti and Kharroubi (2012) are Abdul *et al* (2019), who state that financial development has had positive effects on economic growth up until a certain point, to which negative effects started to prevail. Therefore, financialisation is evidenced to have a fundamental role in suppressing investment, which supports the idea of an inverted-U shaped hypothesis (Tori and Onaran, 2015).

More finance is, therefore, not always better. Epstein and Crotty (2013) argue that the peak of the U-curve should not be viewed as a target but rather as a warning that a further increase in financialisation will result in severe and possibly catastrophic effects on the economy's performance and growth. Recent studies have shown that financial development can enhance the performance and economic growth of the economy up until a certain threshold, past this threshold, however, would be harmful to growth (Abdul *et al*, 2019). Reaching beyond this threshold has been called the 'vanishing effect' and contradicts the 'more finance, more growth' proposition that has been around for years (Abdul *et al*, 2019).

Mainstream literature purports that financial markets facilitate the efficient allocation of finance and investment within an economy. Tori and Onaran (2015), however, suggest that the effects of financialisation begin at the firm level, where financialisation has a fundamental role in suppressing investment in firms which, in turn, suppresses investment within the entire country. Hence, with the new research suggesting that the relationship with investment and economic growth in emerging markets is cyclical, due to mixed evidence, there is a need for controls in order to protect the local economies from volatility of capital flows (Tyson and Beck, 2018).

2.4 The South African Perspective

South Africa is coming from a past of poor growth, low fixed investment, as well as many structural and racial transformation policies aimed towards fixing the prominent unemployment and inequality issues (Zalk, 2018). South African policy-making is dominated by the Orthodox way of thinking, and thus there is support for financial development. According to Abel *et al* (2019), there is a link between financial sector development and economic growth in South Africa. Economic growth has a strong influence on the financial sector. Therefore, South Africa should implement pro-growth policies that will increase investment and financial development (Abel *et al,* 2019).

South Africa relies heavily on inflows of investments to finance the country's current-account deficit, which appears to be ever-widening in recent times. With the South African markets being deeply integrated within the Global Markets, while also being extremely liquid, there is a need to watch Global Market conditions more closely as there can easily be a run on the markets. This would result in massive outflows and catastrophic side effects could arise (Van Zyl, 2019). These outflows could have a number of political risks, as well as other structural factors, that would result in South African stocks not being an attractive investment and would ultimately affect the growth and developmental prospects of the nation. (Brand and Khanyile, 2017).

The financial markets are continuously changing and developing. In 2019, South Africa claimed the top position among 20 other African countries in terms of financial development. In recent times, the South African debt situation has worsened to the point that the country is experiencing an economic contraction for the calendar year, for the first time since 2009 (CNBC, 2020). There was a report posted by Moody's stating that, "Downside risks to growth are both immediate and longer term relating to heightened uncertainty about the economic impact of the Covid-19 pandemic and persisting impediments to growth" (Sable International, 2020). Following the statement by Moody's, South Africa experienced a downgrade to 'Junk' status (Sable International, 2020). Essentially what has happened is that South Africa's foreign and local debt is currently sitting at a Baa3 rating, which is one level below 'investment grade' according to the credit rating agencies (CNBC, 2020). This downgrade is a reflection of the continuing deterioration of the fiscal strength and growth of the economy. This has placed South Africa in an extremely vulnerable position in the political, economic and financial sphere, with this being the first time South Africa is below 'investment grade' in the last twenty-five years. The downgrade has had many implications in that South African bonds have now been removed from the World Government Bond Index (WGBI). This means that global investors who hold South African bonds will be forced to sell their exposure to the country. The outflow that will be experienced from this will be massive, therefore highlighting South Africa's over-reliance on foreign income.

Given the country's strong linkages with the rest of the world, South African asset markets are extremely exposed to changes in global sentiment. Continued low growth will also constrain asset prices (SARB, 2019). The South African credit rating downgrade coupled with the selloff of equities during the pandemic, the poor economy, weak performance and integrity of government organisation, is a recipe for disaster. According to research done at Harvard's Center for International Development, South Africa has not been able to increase the complexity of its economy which has resulted in an over-reliance on public welfare and capital intensive rather than labour intensive industries (Gossel and Koelble, 2020).

With South Africa being in support of the Orthodox argument, there is an inflation targeting monetary policy in place. As stated earlier the inflation targeting framework is believed to contribute heavily towards economic stability, which in turn encourages savings, investment, economic growth and all-round international development and competitiveness (Pettinger, 2018). In South Africa, however, one of the main criticisms regarding inflation targeting is the 'Tinbergen principle' which, "directs one to assign only one goal to each available policy instrument" (Woodford, 2012:4). There is also an argument identified by Kabundi, Loate and Viegi (2020) in what is known as the 'trilemma hypothesis', by which an independent monetary policy is compatible with free international capital mobility as long as exchange rates are determined by market forces (Kabundi, Loate and Viegi, 2020). This principle is used as a justification for the monetary policies implemented in many emerging market economies (Kabundi, Loate and Viegi, 2020).

It is now widely accepted that Neoliberalism has caused a global shift towards capital, this is true for South Africa as well. Financialisation has been identified as problematic in emerging market countries (Karwowski, 2017). For South Africa, the argument is that the problems are caused by other factors, such as, inflexible labour markets, rising government debt, corruption and an incapable State (Fryer, 2016). The argument put forward by Pons-Vignon and Segatti (2013) is that fiscal austerity, inflation targeting, and globalisation has resulted in South Africa being a cost-containing, rather than a developmental state.

Until there can be some direction to contain and fix this, South Africa will not be able to achieve the economic growth and development needed to achieve the country's economic goals.

The activities of large groups in South Africa, such as Anglo America, are seen as major drivers for financialisation in the country. These large companies have become increasingly involved in the global financial system since 1994, due to the rise in market integration. There is an argument that financialisation in developing and emerging markets is mainly driven by financial liberalisation within those markets. Since the growth in financialisation, there is a belief that companies shift from bank-based to market-based financial structures. This has been evident in South Africa since the economy became highly integrated into the global market, the nation went from a net lender to a net borrower, thus increasing the capital inflows into the country (Karwowski, 2017). This means that banks lose importance as credit providers, which in turn means that companies turn to capital markets as a source of external finance (Karwowski, 2017).

Financialisation in South Africa has resulted in a combination of short-term capital inflows with large long-term outflows of capital through legal and illegal channels as there has been a shift for Multinational Corporation to list their operations offshore while focusing on Minerals-Energy Complex (MEC) sectors in South Africa (Ashman, 2015). The MEC is believed to lie at the core of the South African economy, not only through its weight in the economy, but through all spheres of the economy (Froestad, Nokleberg, Shearing and Trollip, 2018). The MEC sector in South Africa has been dominated by a cluster of industries, which are heavily reliant on the State. However, the South African economy is very export oriented, which can be seen more in the form of beneficiated raw materials rather than manufactured products (Froestad *et al,* 2018). The power sector development in South Africa has been very similar to those of many other countries, larger companies extinguished smaller companies by taking over, essentially forming a monopoly (Froestad *et al,* 2018). An integral part in the forming of the MEC was the monopolization of Eskom. The initial focus when supplying electricity was concentrated on heavily populated industrial urban areas. However, there was soon a soaring demand in the mining industries, especially the gold mining sectors with mines becoming deeper and more technologically intensive (Froestad *et al,* 2018).

For decades, the MEC's positions remained unchallenged and the key elements unaltered. This was due to the high importance of the MEC. The electricity crisis that has struck South Africa in recent times, combined with the increasing global concerns about the environment and the emission of GHG's (Greenhouse Gas) (Froestad *et al,* 2018). This opened the window of opportunity for new voices looking for change. The voices challenged the governance that underpinned the MEC, demanding more transparency and civil participation in the planning processes (Froestad *et al,* 2018). This resulted in regulatory reforms allowing the participation from private investors in generating renewable energy sources, while Eskom would remain the dominant generator and sole transmitter of energy (Froestad *et al,* 2018). With Eskom's performance rapidly deteriorating the MEC seems to have lost some of its hold over energy in the country. This deterioration has resulted in loss of trust from the mining industry which have begun to explore sustainable supply alternatives (Froestad *et al,* 2018). Without radical change in the countries energy intensive industrialisation strategy, the MEC is likely to continue to dominate, opening opportunities for devastating impacts on South Africa's society and ecological environments (Froestad *et al,* 2018).

The short-term nature of capital inflows has affected the time horizons of financial institutions. The effects of financialisation in South Africa can be seen as a distinct but interconnected process, which is the result of policy choices and the working markets (Ashman, 2015). Financialisation has a critical impact on lending patterns, consumption and investment. Unregulated international capital flows, along with the policies being implemented, facilitate rapid short term capital inflows that facilitate a long-term export of capital (Ashman, 2015).

There is thus the concern of whether South Africa has exceeded the level of financial development that is beneficial to its economy (Pons-Vignon and Segatti, 2013). The Orthodox way of thinking has dominated South Africa's policy implementation strategies since democracy (Fryer, 2016). Countries like South Africa rely upon access to the pools of cheap capital, accompanied by the view that financial markets are largely efficient in the long-run. The issue that arises is that South Africa depends on investments in order to overcome scarcities such as resources, capital and ultimately growth, suggesting that there may be an overreliance on foreign finance (Blinder, 2015). The case study presented by Isaacs (2016) provides evidence of significant domestic financial development in South Africa since the 1960s.

Further support for this is provided by Mohamed (2019), who suggests that capital flight from South Africa has been rampant. Many South Africans have made a concerted effort to accumulate wealth in countries other than their home nation. The avoidance of keeping the wealth in South African could arise from political instability as well as fears due to the weakness of the economy. There is evidence that larger corporations in the country with access to capital and the global markets choose to restructure and internationalise their operations in a way that does not add to an accumulation of capital or growth in the economy (Mohamed, 2019:158). These larger corporations listed on the Johannesburg Stock Exchange have a majority of their portfolio shares owned by foreign investors. This provides a risk as withdrawing money from their investments creates a further capital flight from the economy. It has been found over the last few decades that the world stock markets have surged and there has been rapid development for African stock markets, such as the JSE, however, the issue arises that in most stock markets there are a few large corporations in which most trading occurs resulting in these organisations accounting for a large share of the total Stock Market Capitalisation (Yartey and Adjasi, 2007:27).

Mohamed (2019:47) suggests that the policies that have been implemented have not been adequate to address the structural weaknesses in the economy. The economic policies of the post-apartheid democratic government have aimed to attract foreign finance and investment, as it was believed that the foreign investment would flow into the country and reshape and modernise the current economy (Mohamed, 2019:47). In a country like South Africa, the stock market is the most important source of long-term external finance that the country has, therefore highlighting the importance of the stock markets and their development (Yartey and Adjasi, 2007:27).

The increasing integration of the global markets has only compounded the issues that South Africa has been facing as there is now increased vulnerability to problems that other countries are facing (Mohamed, 2019:210). The increased integration has made it easier for wealthy South Africans to invest their incomes elsewhere, therefore exacerbating the increased outflows from the country. These shortcomings create room for discussion as to whether increased aggregate savings and investment benefit the economy as a whole (Yartey and Adjasi, 2007:27). The research conducted by Mohamed (2019) supports the claim that South Africa is experiencing financialisation and that this financialisation has impacted real economic development, specifically investment. Contrary to the above is the views presented by Myuambiri and Odhiambo (2017), who provide evidence to support the role of financial development in South Africa. Myuambiri *et al* (2017) put forward the idea that financial development was split into bank-based and market-based financial development, which were both found to have statistically significant effects on investment. The study found that market-based financial development has a positive accelerator enhancing effect in the long-run, therefore concluding that market-based financial development has long run positive effect on investment in the long run (Myuambiri and Odhiambo, 2017). This gives rise to the need to further investigate the effects of financialisation on investment, specifically in a South African context.

2.5 Conclusion

The international literature shows that there is a debate between the Orthodox and Heterodox views. The debate provides evidence of the benefits and consequences to both sides of the argument. The literature highlights the need to look further into the factors contributing to both views, and the ever-changing global financial markets create a need for views to constantly be re-assessed and re-evaluated to keep up with the current events.

With increasing market integration and globalisation, a more prominent need for all events in the global financial markets to be closely monitored has emerged. The developing nations' increasing reliance on capital inflows from abroad creates risks to the local economies, along with increased capital comes increased volatility and risks. There is thus literature on the idea of an inverse-U relationship that arises. This provides the idea that there should be a 'mix' between private and public finance. It is suggested that there are benefits to financial liberalisation, however, there is a need for some effective regulation. The inverse-U rhetoric provides that financial development is good up until a certain point, and that upon reaching this point, the excessive finance becomes counterproductive to the economy (Abdul *et al*, 2019).

In the South African context, there is literature to support both sides of the argument. There is praise for the South African private financial development, which directs the blame for the poor economic performance on other factors such as government debt and corruption. However, there is also literature indicating that South Africa is over-reliant on foreign capital as a source to finance the fiscal deficit of the country. The issue that arises from the increased capital inflows is the increased capital flight as wealthier South Africans are keeping their money offshore. Therefore, the policies implemented by the government are not sufficient enough to improve the allocation of foreign capital towards enhancing the rate of accumulation of capital in the economy. This raises the idea that South Africa is suffering from financialisation.

This over-reliance of South Africa brings about the literature identifying the idea that there is an inverse-U relationship between investment and financialisation in South Africa. There does not, however, appear to be an abundance of empirical evidence attempting to measure such a relationship. This gives rise to the proceeding chapters of the thesis, which attempt to provide empirical evidence of the inverse-U theory in South Africa.

Chapter 3 – Empirical Methodology and Goals

Chapter 2 indicates that theory suggests the idea of an inverse-U relationship. This chapter sets out the empirical methodology used in testing this hypothesis.

3.1 Goals

The goal of the research is to investigate whether South Africa's financialisation is detrimental to investment. In order to achieve the main goal, the research is split into the following sub-goals:

- To explore the measures of financialisation and to assess the degree to which South Africa is financialised in a comparative perspective.
- To empirically test the claimed inverse-U relationship between financialisation and economic performance at the global level.
- To assess the implications for South Africa of the empirical findings regarding the inverse-U relationship.

The purpose of this chapter is to explain the data and methodology used to test the second sub-goal.

3.2 Methodology

There are three commonly known philosophical paradigms in research, namely positivism, interpretivist and critical theory (Ryan, 2018:1). The selection of the paradigm should guide the way forward for the method and analysis of the research (Ryan, 2018:1). The research paradigm for this study is a positivist study. A positivist study relies on a hypothetico-deductive method to substantiate a priori hypothesis (Park, Konge and Artino, 2020). A hypothetico-deductive model of science is a circular process, which begins with a theory. This theory develops into literature with a testable hypothesis (Park *et al*, 2020). An experiment is then designed that will be implemented through the manipulation of a certain group of variables and an empirical study will be conducted (Park *et al*, 2020). The end goal for the implementation of this paradigm is to help enhance theory and contribute to literature, therefore completing the circle and contributing to obtaining clarity on the research topic at hand. (Park *et al*, 2020).

Although numerous studies have explored aspects of the relationship between financialisation and investment, there does not seem to be an attempt in the South African literature to quantify the inverse-U relationship.

The first sub-goal was explored in Chapter 2, which was the literature review. Building on this, descriptive statistics and graphical analysis will be used as the first step in achieving the second sub-goal. These statistics will primarily be focused on looking at Investment/GDP and Stock Market Capitalisation/GDP over the full-time frame of the research, with a set sample of countries.

During the second step towards achieving the second sub-goal, a panel analysis will be implemented in order to test the following quadratic relationship (Gujarati and Porter, 2009: 210-212):

$$Y_{It} = \beta_0 + \beta_1 X_{it}, + \beta_2 X^2_{it}, + \beta_3 C_{it} + u_{it}$$

In the above formula, Y is Investment/GDP, X is the Stock Market Capitalisation/GDP, X^2 is the square of Stock Market Capitalisation/GDP and C is the control variables. These variables are further explained in Chapter 4. The panel analysis will allow for the testing of the hypothesis that the relationship between Y and X is an inverse-U shape, specifically:

$\beta_1 > 0$ and

$\beta_2 < 0$

Once the decision has been made as to exactly which control variables are to be included in the regression analysis, the unit root problem needs to be assessed. There is a need to identify whether variables are stationary in a time series, as non-stationary variables produce biased standard errors (Gujarati and Porter, 2009: 766). This essentially means that the criteria used to check for a causal relationship between the variables is highly unreliable (Mahadeva and Robinson, 2004:6). Any researcher generally wishes to quantify their research with assessing relationships between variables, therefore inferring these results from noisy data can ruin the integrity of the analyses by suggesting statistically significant relationships when none really exist, which is the issue of a spurious regression (Mahadeva and Robinson, 2004:6). This is why the unit root test is so vital in regression analyses. Once a unit root test is applied in order to assess whether the variables are stationary, it is often found that some may not be stationary. This gives rise to the statistical method in which the non-stationary variables need to go through a process of differencing or detrending in order to be stationary and reduce the dangers of reporting a spurious regression (Mahadeva and Robinson, 2004:11). If any variables are not integrated of order zero, I(0), then a cointegration test needs to be conducted. This test is used to analyse a set of variables where two, or more, non-stationary time series are integrated together over time (Dolado, Jenkinson and Sosvilla-Rivero, 1990:249-273).

There are generally three types of data that are available for empirical analysis, these are cross section, time series and a combination of cross section and time series, also known as pooled data (Gujarati and Porter, 2009: 434). For the research implemented here, a panel regression analysis will be concluded. One of the most popular regression functions used in econometrics is the Ordinary Least Squares (OLS) analysis. This analysis is used to test the unknown parameters in a linear regression model (Gujarati and Porter, 2009: 79). The model was initially designed as a bivariate model and has since expanded into a multivariate model. One of main problems with regards to the estimation of the OLS method is the issue of autocorrelation, this is defined by Gujarati and Porter (2009: 435) as "correlation between members of series of observations ordered in time [as in time series data] or space [as in cross-sectional data]". Once the issue of autocorrelation arises, the OLS estimators are seen as inefficient and may no longer be the best linear unbiased estimator available (Gujarati and Porter, 2009: 435).

In order to account for the issue of autocorrelation, there is the Autoregressive Distributed Lag (ARDL) model. This model addresses the autocorrelation problem in that an AR model is implemented, and this model is interpreted as the regression of the random error term on itself, lagged one period (Gujarati and Porter, 2009: 441). Therefore, the ARDL includes one or more lagged values of the dependent variable, as well as lagged values of the explanatory variables (Gujarati and Porter, 2009: 639). This makes the ARDL a useful model as it is good at forecasting long-run relationships from short-run dynamics. This comes from the ARDL being an Ordinary Least Squares model that is applicable for both non-stationary as well as time series with mixed orders of integration (Shrestha and Bhatta, 2017:79).

With the ARDL approach seemingly being the most suitable model for analysing panel data, there is a need to assess certain aspects when implementing this model. Samargandi, Fidrmuc and Ghosh (2015: 71) identified specific criteria that need to be met with regards to the implementation of an ARDL model. The size of the relative T and N is crucial, and both of these aspects need to be large enough for the ARDL technique to be efficiently implemented. A failure to fulfil the criteria will result in an inconsistent estimation (Samargandi *et al,* 2015:71). This is supported by Gujarati and Porter (2009: 660), in that the ARDL test is seen as a large-sample test and its application with smaller samples is not strictly justified. Therefore, with the use of annual data, there tends to be insufficient degrees of freedom. If ARDL is not feasible, as proved to be the case in this study, OLS may be used, provided the problem of autocorrelation is not too severe.

A panel Ordinary Least Squares regression can be run by implementing Fixed and Random effects models. Ultimately selection is made between these two models by using a Hausman test (Gujarati and Porter, 2009: 629). The Fixed Effects model uses the basis that, although the intercept may differ across subjects (countries), each subject's intercept does not vary over time, therefore meaning that a Fixed Effects model is time-invariant. When implementing the Fixed Effects model, one needs to be wary to not introduce too many dummy variables and fall into the dummy variable trap (Gujarati and Porter, 2009: 620). The Random Effects model differentiates from the Fixed Effects model in that instead of a fixed intercept, the intercept represents the mean value of all cross-sectional intercepts and the error term (Gujarati and Porter, 2009: 625). Both models need to be wary of issues that they may experience, such as multicollinearity, and there needs to be the assessment of whether there is the presence of autocorrelation. In order to check for these issues, the Durbin Watson (D-W) statistic is analysed and the Correlogram-Q-Statistic is used. For the D-W statistic values from 0 to less than 2 indicate positive autocorrelation, values from 2 to 4 indicate negative autocorrelation, and a Durbin Watson statistic of 2 indicates that there is no autocorrelation (Gujarati and Porter, 2009: 456). With regards to the Correlogram-Q-Statistic, the table that is generated can be analysed and the presence of serial-correlation (autocorrelation) can be determined. The results for the tests can be found in Chapter 4.

The third sub-goal of the research is achieved in the discussion section presented in Chapter 4. This sub-goal will look at the results of the descriptive statistics and empirical analysis in order to draw conclusions on the implications from a South African perspective.

Chapter 4: Results and Analysis

4.1 Introduction

Rising market integration and globalisation have had positive and negative effects on the global financial markets. As identified in the literature review, there is a debate between the two contrasting views in Economics, namely Orthodox and Heterodox. The Orthodox view, which is the dominant way of thinking, supports market liberalisation and the idea that markets will self-correct in the long-run. The Orthodox way of thinking suggests there is a positive relationship between financial development and economic growth. Contrasting this idea is the Heterodox view, suggesting that the Orthodox view fails to anticipate the true effects of financial liberalisation and overlooks the resounding negative consequences (Fitzgerald, 2006). These arguments give rise to the idea of an inverse-U theory which suggests that there is a threshold, above which further financial development and financial globalisation has detrimental effects on the real economy. This, in turn, brings about the idea that South Africa could be struggling from financialisation.

The literature that introduces the idea of the inverse-U theory in Chapter 2, paves the way for empirical investigation into the relationship between financialisation and investment. In order to analyse this relationship, Stock Market Capitalisation/GDP is used as a proxy for financial development and Investment/GDP is used as the key 'real' economic indicator.

This chapter is divided into six sub-sections. Firstly, section 4.2 describes the data and sampling, which covers where the data was accessed, the years and the country base selection process. Section 4.3 is the descriptive statistics, where the graphical analysis is presented and analysed. Section 4.4 is the panel data analysis. Finally, section 4.5 is the interpretation and discussion of results.

4.2 Data source and Variables

This section provides a description of variables used for this study, as well as any limitations that emerged as a result of the variables and time frame selected.

4.2.1 Description of Variables

In order for the variables to be fully analysed, there is a need for a detailed description of what each variable entails. All the data for this research is acquired from The Global Economy (2020), and is used for a time period from 2002 to 2017. Table 1 below shows the description of the variables used in the descriptive statistics and the panel analysis.

Table 1: Description of Variables

Regression Name	**Variable Name**	**Description**
ECO	Economic Growth Rate	The annual economic growth rate of GDP based on the constant value of the local currency. The aggregates are based on constant 2010 U.S dollars.
GDP	GDP per capita, constant 2010 US$	Gross Domestic Product divided by the midyear population. The data is based on constant 2010 U.S dollars.
INV_G	Capital Investment as a % of GDP	Gross capital formation (formerly known as gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. This is displayed as a percentage of GDP
INF	Inflation	Measured as the annual percentage change in the consumer price index
T_OPN_G	Trade Openness as a % of GDP	Exports plus imports as a percentage of GDP.
GOV_S_G	Government Spending as a % of GDP	General government final consumption expenditure. This includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation. The government

		expenditure is displayed as a percentage of GDP.
IR	Real Interest Rate	Real interest rate is the lending interest rate adjusted for inflation as measured by the GDP deflator.
CAP_M_G	Stock Market Capitalisation as a % of GDP.	Market capitalisation (also known as market value) is the share price times the number of shares outstanding (including their several classes) for listed domestic companies. These values are end of year (OEY) values.
CAP_M_SQ_G	Stock Market Capitalisation as a % of GDP, squared	Stock Market Capitalisation as a percentage of GDP, squared.
SAV_G	Savings as a % GDP	Gross savings are calculated as gross national income less total consumption, plus net transfers.
HDI_V	Developed	The value is 0 if the country has a 'High/Medium' Human Development Index and 1 if the country has a 'Very High' Human Development Index.
F_CRISIS	Financial Crisis	The value is 0 if before the financial crisis, (2001 – 2008), and is assigned a value of 1 if after the financial crisis 2009 onwards.

Apart from the variables described above, there is the need to assess the country selection for the data. The countries that are used for the research are split into two distinct categories, 'Very High' and 'Medium/High'. The country selection is based off of the average values of the Human Development Index from 2002 to 2017. The country base is displayed below in Table 2.

Table 2: Country Selection

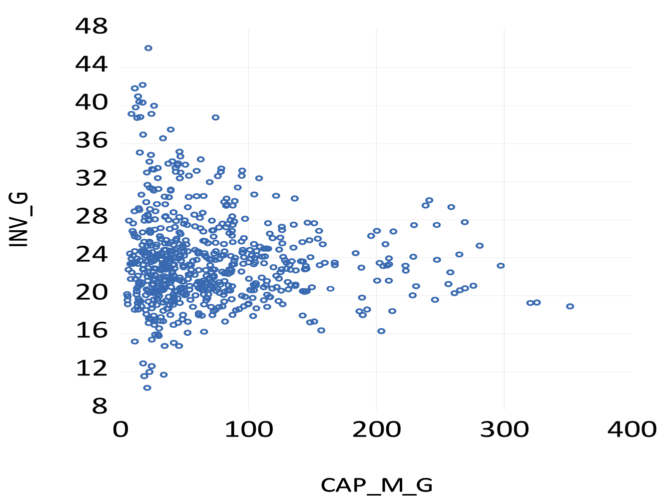
Very High		High/Medium	
Country	Average Human Development Index (2002 to 2017)	Country	Average Human Development Index
Chile	0.8093125	Namibia	0.587
Hungary	0.8185625	South Africa	0.6564375
Portugal	0.8200625	Indonesia	0.66225
Poland	0.831375	Palestine	0.6695
Malta	0.842875	Philippines	0.6738125
Greece	0.852125	Tunisia	0.7086875
Spain	0.861625	Thailand	0.7165625
France	0.8709375	Peru	0.72175
Slovenia	0.874625	Brazil	0.724875
South Korea	0.875125	Turkey	0.738625
Austria	0.882125	Mexico	0.742
Israel	0.8848125	Sri Lanka	0.74475
Japan	0.886875	Mauritius	0.7455625
Luxembourg	0.8885625	Iran	0.7488125
Singapore	0.893375	Malaysia	0.7656875
Canada	0.8995	Oman	0.7843125
New Zealand	0.89975		
Belgium	0.9001875		
Ireland	0.9020625		
USA	0.9065		
Netherlands	0.9089375		
Germany	0.9164375		
Australia	0.92		
Switzerland	0.923125		
Norway	0.93925		

Source: own calculation from The Global Economy (2020).

The first problem faced was with regards to the time frame for the data. The time frame was initially designed to be a 21-year time period, from 2000 to 2020. However, due to data limitations in certain years, the time frame was decreased to a 16-year time period from 2002 to 2017. After analysing the data for the variables, there was a need to disregard certain variables, as well as certain countries. From the variables displayed in Table 1, Interest Rates and Savings/GDP were dropped as these variables did not have enough data for the specified date selection and country base. With regards to the data for the country selection, this was initially based off of a sample of 52 countries. The country base was restricted down to a selection of 43 countries. This restriction arose as the original country selection did not have the correct availability of data. Using the full selection of 52 countries would have required the disregarding of more variables, including Stock Market Capitalisation/GDP which is crucial for this study. This country base was further restricted as there were two extreme outliers which skewed the data. The two outliers, Panama and Hong Kong, were removed from the dataset and the final dataset is 41 countries. The reason for dropping the two countries is that they were severe outliers with regards to the two most important variables, Stock Market Capitalisation/GDP in the case of Hong Kong and Investment/GDP in the case of Panama.

Figure 1 below shows the relationship between Stock Market Capitalisation/GDP and Investment/GDP once the outliers have been removed, showing that there are no severe outliers within the current dataset.

Figure 1: Pooled data for Stock Market Capitalisation/GDP and Investment/GDP



Source: own calculation from The World Economy (2020).

Analysing the data and comparing the relationship between Investment/GDP and Stock Market Capitalisation/GDP is key to the research, therefore this gives rise to the descriptive statistics and graphical analyses in the next section.

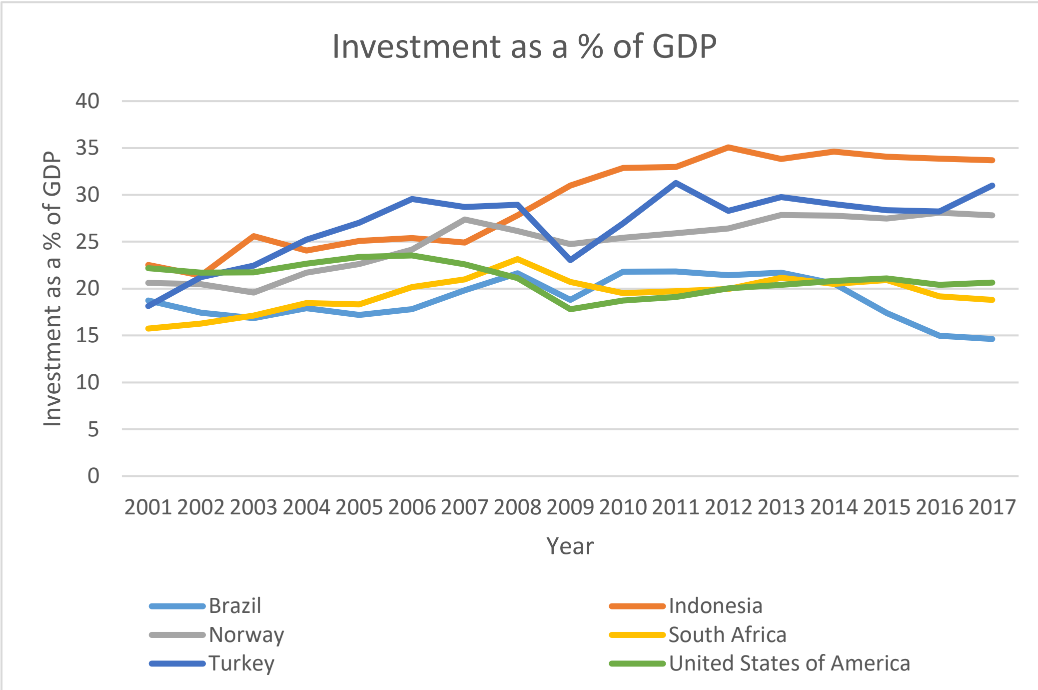
4.3 Descriptive Statistics

The descriptive statistics are displayed in the form of a graphical analysis, which is implemented on various variables in order to assess the relationship between the countries over time. The analysis will show any patterns or trends and identify any large events that could have significantly impacted the variables. All the figures displayed in the descriptive analysis will be for a specific country selection, as displaying all the countries within this study will result in overcrowded figures. Therefore, the selection of countries used in this analysis is the Fragile Five, these are five emerging market economies which are seen as too reliant on foreign investment finance in order to reach the growth goals of the country (Keupper, 2017). For the descriptive statistics below, the Fragile Five countries of South Africa, Brazil, Indonesia and Turkey are displayed. India is removed from the dataset as the country displayed problems with regards to data availability across a broad range of variables. As a point of comparison, in order to make a clear assessment of mutual patterns that could arise, two of the more highly developed nations with regards to the HDI values are displayed. The two aforementioned countries are Norway and the United States of America.

4.3.1 Investment/GDP

Figure 2 below displays 'Investment/GDP' on the y-axis and the time period, which is years, on the x-axis.

Figure 2: Investment/GDP



Source: own calculations from The Global Economy (2020).

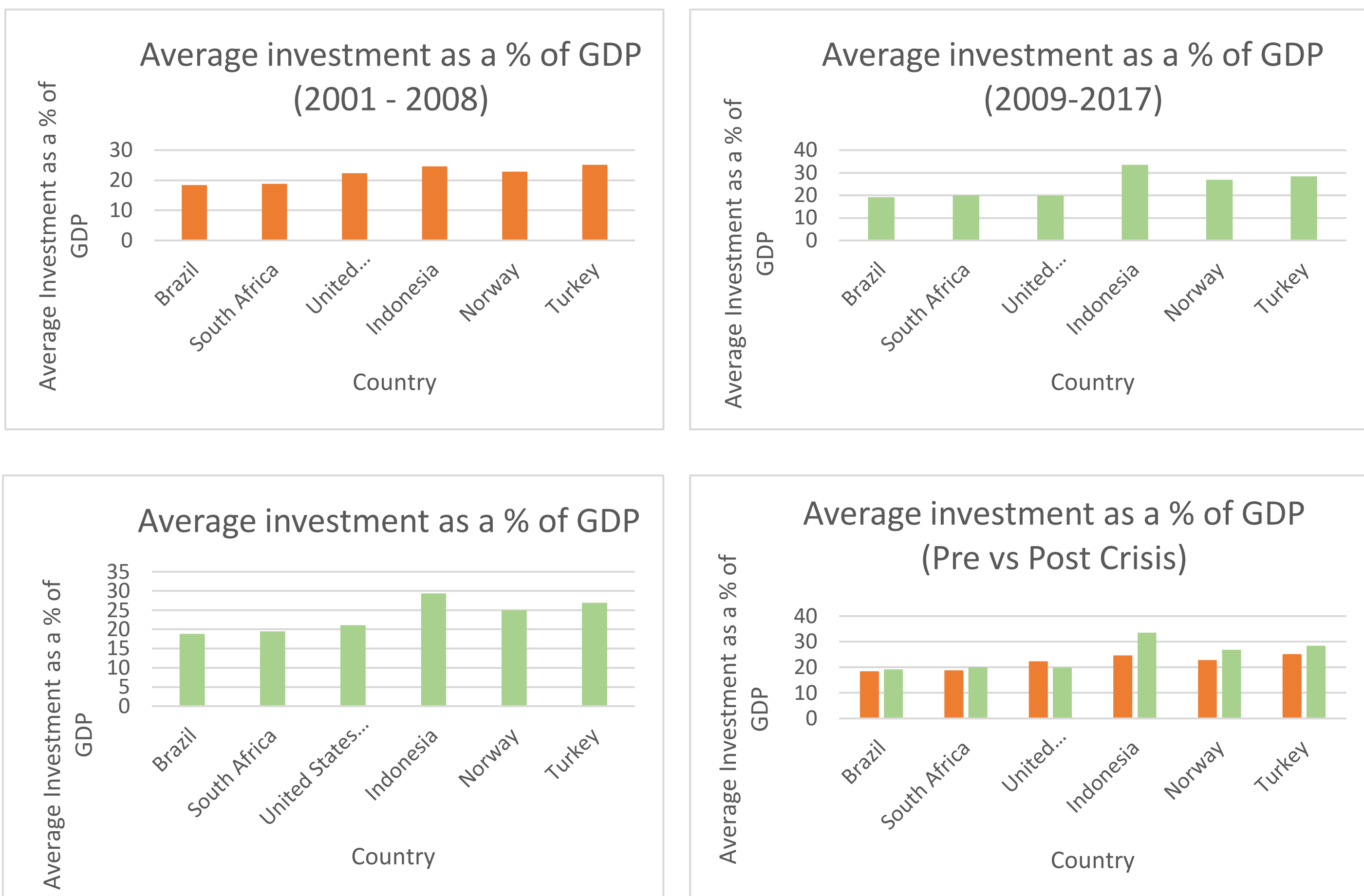
Figure 2 begins in the year 2001. Clear patterns emerge when analysing the figure, the first common feature is that South Africa and Turkey begin with a slight increase in the level of Investment/GDP, where as Brazil, Norway, Indonesia and the United States of America begin with a gradual decline, up until 2004. However, in this time, Indonesia turned from negative to positive Investment /GDP in 2002. All the countries displayed a gradual net increase in Investment/GDP in the period 2004 to 2007, except the United States of America which showed a decline. The 2008 year met all the countries, except Indonesia, with a drastic decline in Investment/GDP. Norway, Indonesia and the United States of America continue along a path of a gradual, but slight net increase in the level of Investment/GDP from 2009 to 2017. Brazil initiated their post-financial crisis period, 2009 to 2017, with a steep recovery in the year proceeding the financial crisis. This recovery for Brazil is followed with stagnant growth for the remainder of the testing period. Turkey displayed a net increase accompanied with extreme volatility over the 2009 to 2017 period. It is evident that South Africa has a lower level of Investment/GDP compared to its peers and was slightly slower to recover from the 2008 financial crisis. Post-financial crisis, South Africa displayed very stagnant levels of Investment/GDP.

4.3.2 Investment/GDP pre & post Global financial crisis.

Looking at the above analysis on Investment/GDP, there is room to compare the pre- and post-global financial crisis periods. This gives rise to the set of figures below, which is Figure 3. Figure 3 is a set of 4 graphical depictions, and it shows the pre-global financial crisis period, the post-global financial crisis period, the entire time periods average Investment/GDP, as well as a combination of the pre- and post- global financial crisis periods.

Figure 3 displays 'Average Investment/GDP' on the y-axis and the time period, which is years, on the x-axis.

Figure 3: Average Investment/GDP pre- and post-Global financial crisis.



Source: own calculations from The Global Economy (2020).

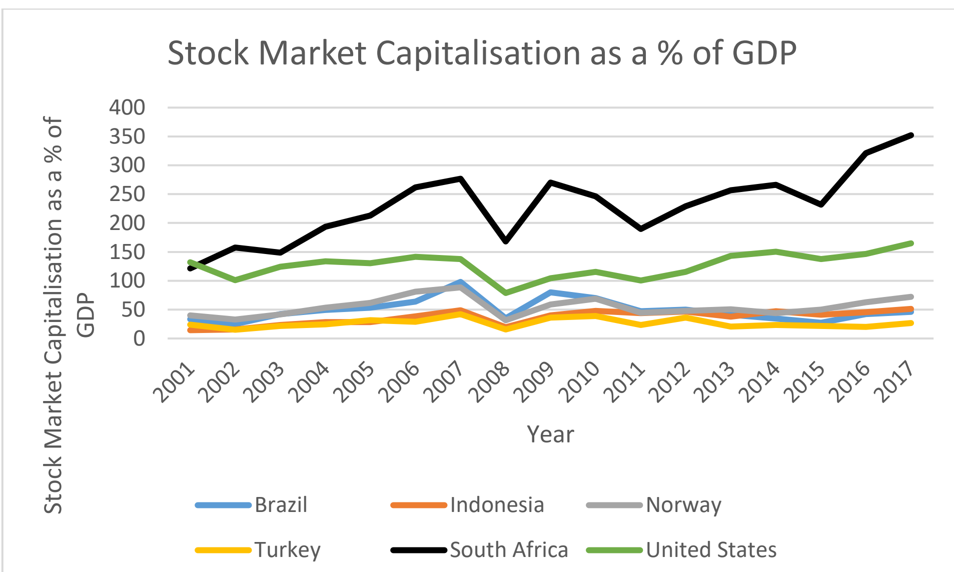
Evidenced from the above set of Figures, with focus on the 'Average investment as a % of GDP (Pre vs Post Crisis)' figure, is that in most countries the average level of Investment/GDP increases. The increase in Investment/GDP is evident in all emerging market economies presented in figure 6 above, the only decrease in Investment/GDP is the United States.

4.3.3 Stock Market Capitalisation/GDP

According to The Economic Times (2018), Stock Market Capitalisation/GDP is defined as, "the aggregate valuation of the company based on its current share price and the total number of outstanding stocks, this is calculated by multiplying the current market price of the company's share with the total outstanding shares of a company".

Figure 4 below displays 'Stock Market Capitalisation/GDP' on the y-axis and the time period, which is years, on the x-axis.

Figure 4: Stock Market Capitalisation/GDP



Source: own calculations from The Global Economy (2020).

Figure 4, beginning in 2001, provides evidence from first glance that South Africa has a much higher Stock Market Capitalisation/GDP than the other countries. A common pattern that emerges is that there is an initial decline in the level of Stock Market Capitalisation/GDP for all the countries, except South Africa, which begins with a steep increase. All countries increase slightly up until the 2008 financial crisis, with South Africa experiencing a much steeper incline than any of the other comparison countries. A common pattern emerges with the 2008 financial crisis, which is a sharp decrease in the Stock Market Capitalisation/GDP. Post-2008 financial crisis Brazil, Indonesia, Turkey and Norway showed an immediate recovery, followed by stagnant growth through to 2017. The United States showed a slightly less drastic increase post-2008 financial crisis, with increasing levels of Stock Market Capitalisation/GDP through to 2017. South Africa showed an astoundingly steep increase in Stock Market Capitalisation/GDP following the 2008 financial crisis, basically counteracting the drop caused by the crisis. This was followed by volatility in the level of Stock Market Capitalisation/GDP, resulting in a net increase.

4.3.4 Descriptive Statistics Discussion

Looking at Figures 2 and 3, there is clear evidence that South Africa has a low Investment as a percentage of GDP compared to its peers. The evidence shows that there was a positive growth path as the rate of Investment/GDP was increasing up until the Global financial crisis. Post crisis, South Africa seemed to be volatile with a stronger decreasing trend compared to its peers. The Stock Market Capitalisation/GDP for South Africa is well above its peers. The volatility of the Stock Market Capitalisation as a percentage of GDP was followed by a steady increase, replicating the pre-Global financial crisis period. Looking at these two variables together, the relationship is suggestive of the decoupling of finance from the real economy, and of the possibility the South Africa may be suffering from financialisation.

Following the descriptive statistics is a panel analysis in order to further research the variables and empirically test the inverse-U hypothesis.

4.4 Panel Data Analysis

Proceeding the descriptive statistics is the econometric analysis. The econometric analysis begins with the panel unit root tests, followed by the cointegration test and finally the panel Ordinary Least Squares model.

4.4.1 Unit Root & Cointegration

The first step in any time series regression is to conduct the unit root tests, in this case, the panel unit root tests. This is done in order to assess the stationarity of variables. The panel unit root tests are displayed below in Table 3 below:

Table 3: Panel Unit Root Tests

Variables	Unit root tests			
	Levin,Lin & Chu t*	Im, Pesaran and Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-square
INV	-4.66052***	-3.44473***	131.508***	139.236***
CAP_M_G	-5.31430***	-3.94253***	138.932***	238.969***
CAP_M_SQ_G	-4.41780***	-3.18465***	130.545***	217.253***
ECO	-8.74912***	-6.45865***	176.171***	281.071***
GDP	0.33358	2.93118	64.8182	72.7735
D(GDP)	-8.92596***	-5.85541***	166.900***	256.019***
GOV_S	-4.11981***	-0.49079	86.8728	93.9536
D(GOV_S)	-10.4078***	-7.64934***	203.796***	328.442***
INF	-8.17307***	-5.82648***	168.283***	237.206***
T_OPN	-4.08401***	-0.45652	79.0534	77.6967
D(T_OPN)	-11.9794***	-9.72457***	245.856**	462.643***

* Significant at the 10% probability level; ** Significant at the 5% probability level; *** Significant at the 1% probability level

The results of the panel unit root tests above provide clear evidence that the variables INV, CAP_M_G, ECO and INF are all stationary at the one percent level, which means they are stationary at level terms. The variables GDP, GOV_S and T_OPN are non-stationary at the one, five or ten percent levels, which means these variables are non-stationary at level terms and need to be differenced. After the process of differencing the variables, they are found to be stationary at first differences, at the one percent level.

The results of the panel unit root test give rise to testing the variable group for cointegration. Initially the Fisher cointegration test was to be implemented. However, there was insufficient data for this estimation, and the Kao cointegration test was used. This cointegration test is implemented to analyse whether there is believed to be a long-run relationship between the variables. If there is evidence of cointegration, this means that to some degree, there is the existence of mutual association between two or more variables.

The Kao cointegration test is shown below with the results shown in Table 4:

H_0: There is no cointegration

H_1: There is cointegration

Table 4: Kao Cointegration Test

	t-statistic	Prob.
ADF	-2.871305	0.0020***

* Significant at the 10% probability level; ** Significant at the 5% probability level; *** Significant at the 1% probability level

Looking at the results of the test, with a prob value of 0.0020, the Null Hypothesis is rejected at the five percent level. This suggest that there is cointegration between the variables and that there is, to some degree, mutual association between two or more variables. The next step is to run regressions to test the nature of the long-run relationship between the variables.

4.4.2 Panel Ordinary Least Squares Model

Following the results of the panel unit root tests and the Kao Cointegration test, is the regression analysis. The first regression tested was the Autoregressive Distributed Lag model (ARDL). The first issue that arose with this model is that the size of the time frame is too small. When running the model with lagged dependent variables (LDV's), which are used to provide robust estimates of the effects to the dependent variable, the issue of collinearity arises. This is proceeded by the ARDL model with one lag, however, the issue with this model is that there are not many significant variables present, as can be seen in Appendix 1. Therefore, the ARDL model is not suitable and the panel Ordinary Least Squares (OLS) regression is implemented.

The dependent variable to be used for the panel OLS is Investment/GDP. The independent variables are split into a proxy for financial development and control variables. The variable that will be seen as a proxy for financial development is Stock Market Capitalisation/GDP. The squared value of Stock Market Capitalisation/GDP will be implemented to assess the quadratic effect. Then, the variables of Economic Growth based on constant 2010 US dollars, GDP per capita in constant 2010 US dollars, Inflation as an annual percentage change in the price index, Trade Openness/GDP and Government spending/GDP are implemented as control variables for the study. Included in the study are the dummy variables for the financial crisis, as well as whether a country is classified as developed or not.

The panel OLS is comprised of two models, the Fixed Effects model and the Random Effects model. There have been numerous variations of the panel OLS regressions run, alternating the variables in order to assess the outcomes and select the most suitable model for the analysis. In order to select the most suitable model, the five sets of models, displayed in Appendix 1, are analysed below. The selection of the model is based off the below analysis, which includes an overview assessment as well as an assessment of the significance of the variables, Adjusted R-Squared, F-Statistic and the Durbin Watson statistic.

All of the sets assess the effects of the variables on Investment/GDP. Each set also includes the use of two of the most important variables in the analysis, known as the 'base variables'. These are Stock Market Capitalisation/GDP and the squared value of Stock Market Capitalisation/GDP.

Set 1: This set displays a regression consisting of the two base variables listed above in order to assess their effects on Investment/GDP. This regression shows the Fixed and Random Effects models, as well as the Hausman test to compare the two models and decide which is most suitable.

Set 2: This set displays all the independent variables and their effects on Investment/GDP. It shows the Fixed and Random Effects models, as well as the Hausman test to determine which of the two models is the most suitable for the analysis.

Set 3: This set displays all the independent variables, including the financial crisis dummy and the Human Development Index dummy to assess their effects on Investment/GDP. The Fixed and Random Effects models are displayed, as well as the Hausman test to select suitability of the model.

Set 4: All the independent variables, including the financial crisis dummy, are displayed in order to analyse the effects on Investment/GDP. The Fixed and Random Effects models are displayed, which is followed by the Hausman test to select the most effective model.

Set 5: This set displays all the independent variables and the Human Development Index dummy to assess their effects on Investment/GDP. There Fixed and Random Effects models are displayed, as well as the Hausman test to select suitability of the model.

After analysing all the above-mentioned sets, which are displayed in Appendix 1, and assessing the variables, Set 1 is excluded as there is a decreased array of variables. This small array of variables results in a lower Adjusted R-squared value, as well as there being an exclusion of most of the variables selected for this study. Set 3 and Set 5 are excluded as there is the issue of multicollinearity that arises in the Fixed Effects models, which could mean that the regression has fallen into the dummy variable trap. Therefore, the results of the Random Effects Model and the Hausman test are not effective as the issue of exact collinearity can cause the variables to display the wrong sign. There is also the issue of extremely low Adjusted R-Squared as well as insignificant variables. This caused the decision to be made between Set 2 and Set 4. Although Set 4 displayed a slightly higher Adjusted R-squared value, there is the issue of insignificant variables as well as a lower D-W statistic, indicating that there is a higher possibility of autocorrelation. Therefore Set 2 is selected as all the variables are statistically significant, the adjusted R-squared value is relatively high, the D-W statistic is higher than Set 4 and the F-Statistic is statistically significant.

The results of all the tests are displayed below, this includes the Fixed Effects, the Random Effects of all 5 sets, followed by the Hausman test of the selected set, Set 2. Tables 5, 6 and 7 below show the results of the respective tests:

Table 5: Fixed Effects Models

	Set 1	Set 2	Set 3	Set 4	Set 5
C	20.56752*** (0.571133)	16.16379*** (2.071796)	-	11.15912*** (2.288896)	-
CAP_M_G	0.060216*** (0.011281)	0.041074*** (0.010654)	-	0.046303*** (0.010524)	-
CAP_M_SQ_G	-0.000139*** (3.40E-05)	-0.000120*** (3.14E-05)	-	-0.000134*** (3.10E-05)	-
GDP	-	0.000358*** (4.62E-05)	-	5.18E-05*** (0.000478)	-
GOV_S_G	-	-0.156340* (0.081471)	-	-0.037955 (0.083787)	-
INF	-	0.168977*** (0.041564)	-	0.118779*** (0.042164)	-
T_OPN_G	-	-0.028738 (0.007236)***	-	-0.024454*** (0.007166)	-
ECO	-	0.202781*** (0.042290)	-	0.147877*** (0.043107)	-
F_CRISIS	-	-	-	-1.302544*** (0.272432)	-
R-squared	0.643701	0.702927	-	0.713709	-
Adjusted R-squared	0.619289	0.679963	-	0.691070	-
S.E. of regression	2.959711	2.713637	-	2.666132	-
Sum squared resid	5369.812	4477.206	-	4314.714	-
Log likelihood	-1620.407	-1560.778	-	-1548.653	-
F-statistic	26.36818	30.60927	-	31.52540	-
Prob(F-statistic)	0.000000	0.000000	-	0.000000	-
Root MSE	2.861064	2.612472	-	2.564626	-
Mean dependent var	23.64165	23.64165	-	23.64165	-
S.D. dependent var	4.796798	4.796798		4.796798	-
Akaike info criterion	5.071362	4.904812	-	4.870893	-
Schwarz criterion	5.365424	5.233068	-	5.205987	-
Hannan-Quinn criteria	5.185374	5.032081	-	5.000813	-
Durbin-Watson stat	0.710352	0.722306	-	0.704705	-
Sample:	2002 2017	2002 2017	2002 2017	2002 2017	2002 2017
Periods included	16	16	16	16	16
Cross-sections included	41	41	41	41	41
Total panel (balanced) observation	656	656	656	656	656

* Significant at the 10% probability level; ** Significant at the 5% probability level; *** Significant at the 1% probability level

In Table 5 there are no results for Sets 3 and 5, as when running these regressions both suffered from issues of multicollinearity. This means the regressors are exactly collinear and one regressor can be written as a linear combination of another regressor.

Table 6: Random Effects Models

	Set 1	Set 2	Set 3	Set 4	Set 5
C	21.36741*** (0.788394)	24.66737*** (1.481129)	25.23442*** (1.479158)	24.58798*** (1.472803)	25.32719*** (1.490922)
CAP_M_G	0.045805*** (0.010441)	0.031133*** (0.009738)	0.032171*** (0.009607)	0.0316358** (0.009621)	0.031130*** (0.009721)
CAP_M_SQ_G	-0.000113*** (3.28E-05)	-9.01E-05*** (3.02E-05)	-9.56E-05*** (2.98E-05)	-9.11E-05*** (2.98E-05)	-9.33E-05*** (3.02E-05)
GDP	-	6.32E-05*** (1.97E-05)	0.000110*** (2.50E-05)	6.53E-05*** (1.97E-05)	0.000103*** (2.45E-05)
GOV_S_G	-	-0.222209*** (0.065316)	-0.184099*** (0.066243)	-0.219133*** (0.065452)	-0.196922*** (0.065688)
INF	-	0.180267*** (0.040511)	0.163869*** (0.041141)	0.176981*** (0.040904)	0.174078*** (0.040562)
T_OPN_G	-	-0.017231*** (0.004966)	-0.016807*** (0.004916)	-0.017289*** (0.004945)	-0.017063*** (0.004935)
ECO	-	0.240765*** (0.040896)	0.226531*** (0.041210)	0.238025*** (0.041033)	0.235475*** (0.040927)
F_CRISIS	-	-	-0.223021 (0.237341)	-0.061347 (0.230909)	-
HDI_V	-	-	-3.919891*** (1.310546)	-	-3.545547*** (1.277028)
Weighted Statistics:					
R-squared	0.029576	0.139171	0.149734	0.139453	0.148335
Adjusted R-squared	0.026604	0.129872	0.137889	0.128812	0.137805
S.E. of regression	2.980987	2.846801	2.832465	2.844755	2.836451
F-statisticLog likelihood	9.950958	14.96616	12.64029	13.10587	14.08609
Prob(F-statistic)F-statistic	0.000055	0.000000	0.000000	0.000000	0.000000
Root MSE	2.974163	2.829389	2.810793	2.825173	2.816927
Mean dependent var	4.521514	5.254602	5.225601	5.162615	5.318710
S.D. dependent var	3.021450	3.051867	3.050583	3.047817	3.054728
Sum squared resid	5802.744	5251.569	5182.765	5235.931	5205.410
Durbin-Watson stat	0.619683	0.605968	0.600774	0.605937	0.606046
Unweighted Statistics:					
Mean dependent var	23.64165	23.64165	23.64165	23.64165	23.64165
Durbin-Watson stat	0.215517	0.234059	0.216267	0.230652	0.225378
R-squared	-0.107074	0.097871	0.044705	0.087315	0.071237
Sum squared resid	16684.79	13596.05	14397.32	13755.14	13997.45
Sample:	2002 2017	2002 2017	2002 2017	2002 2017	2002 2017
Periods included	16	16	16	16	16
Cross-sections included	41	41	41	41	41
Total panel (balanced) observation	656	656	656	656	656

* Significant at the 10% probability level; ** Significant at the 5% probability level; *** Significant at the 1% probability level

The Hausman test is used to determine whether the Fixed Effects or Random Effects model best suits the particular regression. The test is described below:

Null Hypothesis: The preferred model is Random Effects

Alternative Hypothesis: The preferred is Fixed Effects.

The test summary results of the Hausman Test are displayed in Table 7 below.

Table 7: Set 2 - Hausman Test results:

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Prob.
Cross-section random	72.157655	7	0.0000

The full Hausman Test is available in Appendix 1. Therefore, by looking at the 'Test Summary' for the Hausman test, the P-Value is 0, which is statistically significant at the 1 percent level. This means that the Null Hypothesis can be rejected and the conclusion can be made that the most suitable regression is the Fixed Effects model. Which gives rise to the below table, Table 8:

Table 8: Set 2 – Fixed Effects Model

C	16.16379*** (2.071796)
CAP_M_G	0.041074*** (0.010654)
CAP_M_SQ_G	-0.000120*** (3.14E-05)
GDP	0.000358*** (4.62E-05)
GOV_S_G	-0.156340* (0.081471)
INF	0.168977*** (0.041564)
T_OPN_G	-0.028738 (0.007236)***
ECO	0.202781*** (0.042290)
R-squared	0.702927
Adjusted R-squared	0.679963
S.E. of regression	2.713637
Sum squared resid	4477.206
Log likelihood	-1560.778
F-statistic	30.60927
Prob(F-statistic)	0.000000
Root MSE	2.612472
Mean dependent var	23.64165
S.D. dependent var	4.796798
Akaike info criterion	4.904812
Schwarz criterion	5.233068
Hannan-Quinn criteria	5.032081
Durbin-Watson stat	0.722306
Sample:	2002 2017
Periods included	16
Cross-sections included	41
Total panel (balanced) observation	656

* Significant at the 10% probability level; ** Significant at the 5% probability level; *** Significant at the 1% probability level

4.5 Interpretation and Discussion of results

This section interprets the results presented in Table 5. Following this interpretation is a discussion of the results and analysis of the implications of the idea of an inverse-U relationship.

4.5.1 Interpretation

The interpretation of the results begins with an analysis of the variables' coefficients, significance and priori expectations. The data shows the relationship of all the variables with Investment/GDP, and the interpretation of each variable's coefficients is displayed below:

C: This is the intercept of the regression. This variable is statistically significant at the 1 percent level. Therefore, the interpretation of the variable is that with all independent variables equal to zero, Investment/GDP will be 16.16379 percent, ceteris paribus.

CAP_M_G and CAP_M_SQ_G are both statistically significant at the 1 percent level and display the expected signs. This supports the main hypothesis, as set out in Section 3.2, namely that:

$\beta_1 > 0$ and
$\beta_2 < 0$

This particular result will be discussed further below. Before that, the results for 'control variables' will be briefly discussed.

GDP: Gross Domestic Product per capita in constant 2010 $US is statistically significant at the one percent level. The interpretation of this variable is that a one percent increase in GDP per capita, on average, will result in a 0.000358 percentage point increase in Investment/GDP, ceteris paribus.

GOV_S_G: The variable for Government Spending/GDP is statistically significant at the ten percent level. This is interpreted as a one percent increase in Government Spending/GDP results in a -0.156340 percent decrease in Investment/GDP, ceteris paribus.

INF: The variable for inflation is statistically significant at the one percent level. The interpretation of this variable is that a one percent increase in the CPI inflation rate, on average, will result in a 0.168977 percentage point increase in Investment/GDP, ceteris paribus.

T_OPN_G: Trade Openness/GDP is statistically significant at the one percent level. The interpretation of this variable means that a one percentage increase in Trade Openness/GDP will result in a -0.028738 percent decrease in Investment/GDP, ceteris paribus.

ECO: The variable for Economic Growth (constant 2010 $US) is statistically significant at the one percent level. The interpretation of this variable is that a one percent increase in Economic Growth, at constant 2010 $US, will result in a 0.202781 percentage point increase in Investment/GDP, ceteris paribus.

An interpretation of the above results, excluding CAP_M_G CAP_M_SQ_G and T-OPN_G, which are interpreted and discussed later as these variables are critical to the study. The variables of ECO and GDP meet their a priori expectations as the variables have positive effects on Investment/GDP. The variable for GOV_S_G also meets its a priori expectations in that the increase in Government Spending/GDP would reduce savings and interest rates, therefore leading to less Investment/GDP. An interesting variable that does not meet its a priori expectations is INF which one would expect an increase in CPI inflation to decrease Investment/GDP, however, the variable above shows that increasing inflation increases Investment/GDP.

A further analysis of the statistics from the results in Table 5 is discussed in the below paragraph. With the R-squared value measuring the success of the variables in predicting the dependent variable, a value of 0.702927 means that 70.30 percent of changes in the dependent variable are explained by the independent variables. This statistic goes hand in hand with the Adjusted R-squared variable. The R-squared variable has an inefficiency in that with additional variables, the R-squared value will never decrease. Therefore, the Adjusted R-squared value penalizes the model if the additional variables do not add value to the dependent variable, providing a more accurate statistic. According to the results, the Adjusted R-squared value is 0.679963, meaning that 68 percent of changes to the dependent variable arise from the independent variables. With an F-statistic that is significant at the one percent level, it means that the model provides better information than that of a model with no independent variables. The Durbin Watson statistic is one of the main statistics analysed. This statistic measures serial correlation, and can therefore pick up on the presence of autocorrelation, with the rule of thumb being a value less than 2 indicates positive serial correlation and more than 2 indicates negative serial correlation. (Gujarati and Porter, 2009: 456). The regression has a D-W statistic of 0.722306, indicating that there is a high possibility that there is the presence of autocorrelation. Following the indication of the presence of autocorrelation by the D-W statistic, the Correlogram-Q-Statistic was tested, the results for this statistic are displayed in Appendix 1, as well as below in Figure 5:

Figure 5: Correlogram-Q-Statistic:

Date: 01/24/21 Time: 17:36
Sample: 2002 2017
Included observations: 656

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|******|	.|******|	1	0.839	0.839	463.63	0.000
.|***** |	.|. |	2	0.697	-0.022	784.23	0.000
.|**** |	.|. |	3	0.579	0.001	1006.0	0.000
.|**** |	.|. |	4	0.486	0.014	1162.1	0.000
.|*** |	.|. |	5	0.400	-0.026	1268.0	0.000
.|** |	.|. |	6	0.327	-0.005	1338.9	0.000
.|** |	.|. |	7	0.271	0.015	1387.9	0.000
.|** |	.|. |	8	0.218	-0.027	1419.6	0.000
.|* |	.|. |	9	0.179	0.017	1441.0	0.000
.|* |	.|. |	10	0.153	0.017	1456.6	0.000
.|* |	.|. |	11	0.126	-0.016	1467.2	0.000
.|* |	.|. |	12	0.099	-0.013	1473.7	0.000
.|. |	.|. |	13	0.069	-0.029	1476.9	0.000
.|. |	.|. |	14	0.044	-0.010	1478.2	0.000
.|. |	.|. |	15	0.023	-0.004	1478.6	0.000

* Significant at the 10% probability level; ** Significant at the 5% probability level; *** Significant at the 1% probability level

From the above figure, the presence of autocorrelation was found. Therefore, the results need to be treated with the reservation in mind that there is evidence of autocorrelation.

Upon analysing the variables, it appears that they meet their priori expectations with regards to signs and effects on investment – the only variable that did not meet expectations would be Trade Openness/GDP which displays a negative sign. Therefore, with the reservation of autocorrelation in mind, the next section is a discussion of the implications of the results.

4.5.2 Discussion of results

Rising financialisation and global market integration have changed the way in which people view the economy. People that are a part of the general working force have their savings and pension funds invested in stock markets. This arises from what is seen as ‘financial hyper activity’, which is changing every aspect of the economy, increasing growth and rising market complexity (Storm, 2018:310). With the markets changing constantly, there is a need to analyse how the change impacts an economy, specifically from a standpoint of growth and investment. Looking at the descriptive statistics, specifically Figures 2, 3 and 4, there is clear evidence that South Africa has low Investment/GDP compared to its peers. The evidence shows that there was a positive growth path as the rate of Investment/GDP was increasing up until the global financial crisis. Post-crisis, South Africa seemed to be volatile with a strong decreasing trend compared to its peers. With Stock Market Capitalisation/GDP being well above its peers, an interesting relationship between these two variables is created.

The relationship between Investment/GDP and Stock Market Capitalisation/GDP is suggestive of the decoupling of finance from the real economy, and of the possibility that South Africa may be suffering from financialisation.

This can be further analysed, with the idea of the inverse-U relationship being assessed. Following the descriptive statistics is the results of the panel OLS. The strongest positive relationship found in the regression is the relationship with Economic Growth and Investment/GDP.

The argument put forward by FitzGerald (2006) states that there is a positive relationship between financial development and economic growth. This gives rise to the view that financial development has a positive relationship with investment, which is supported in the Panel OLS as Stock Market Capitalisation/GDP, which is acting as a proxy for financial development, and Investment/GDP are seen to have a positive relationship. All of these arguments support the Orthodox views as financial liberalisation is seen to have positive effects on economic growth, Investment/GDP and Stock Market Capitalisation/GDP. However, there is also support for the Keynesian views with Trade Openness/GDP and Investment/GDP having a negative relationship in the regression. This indicates that Trade Openness is another aspect of globalisation.

An interesting variable that needs further analysis is the squared value of Stock Market Capitalisation/GDP. This is used to show the quadratic relationship. This variable has a negative relationship with Investment/GDP, which supports the below hypothesis, as set out in the Methodology chapter, Chapter 3:

$Y_{It} = \beta_0 + \beta_1 X_{it}, + \beta_2 X^2_{it}, + \beta_3 C_{it} + u_{it}$

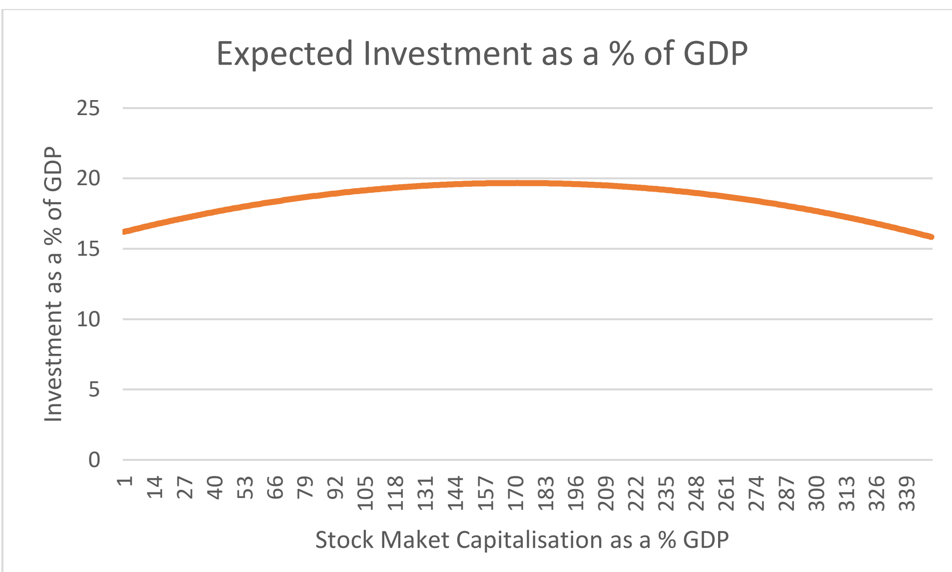
$\beta_1 > 0$ and

$\beta_2 < 0$

In the above formula, Y is Investment/GDP, X is the Stock Market Capitalisation/GDP, X^2 is the square of Stock Market Capitalisation/GDP and C is the control variables.

Looking at the panel OLS results, with the reservation in mind regarding the presence of autocorrelation, the results support the theory of an inverse-U relationship. The analysis of Expected Investment/GDP and Stock Market Capitalisation/GDP was therefore implemented and the below figure was generated, Figure 6.

Figure 6: Expected Investment/GDP and Stock Market Capitalisation/GDP



Source: own calculations.

The Orthodox approach states that financial liberalisation leads to financial development which delivers investment stability (Fitzgerald, 2006). From the graph above, it is evident that this may not be true and therefore, the argument is in favour of the Keynesian perspective.

The model set out in Table 8 suggests that a Market Capitalisation/GDP of 171 percent brings investment to its peak level, which is 19.68 percent. The Investment/GDP level gradually increases as Stock Market Capitalisation/GDP increases, this holds true up until the threshold value, upon which Investment/GDP begins to decrease as Stock Market Capitalisation/GDP continues to rise. The results support the idea of an inverse-U relationship and supports the claim that financialisation could lead to negative effects on the economy. This claim is supported by similar studies conducted by authors such as Gerni, Emsen, Gencer and Tosun (2018), who tested the theory that, 'Net foreign capital investments follow the path of the Kuznets curve and even a W curve'. The findings of this study confirmed the empirical evidence that there is an inverted-U shaped Kuznets curve between per capita income and foreign capital investments. The study showed that less developed countries battle to attract investment levels, however, after reaching a certain point of development the ability to attract investment increases until reaching a threshold value, at which point investment tends to decrease once again (Gerni, Emsen, Gencer and Tosun, 2018).

Further support for the analysis of figure 6 is supplied Ly-Dai(2018), whose empirical analysis resulted in evidence of a threshold of net capital flows that create a positive benefit for a country. The study found that there is a non-linear pattern of capital flows and that the capital flowing into a country will continue to rise as the economy grows, once the economy reaches a certain growth level the capital flows will decrease, therefore creating an inverse-U shape.

The Keynesian approach argues that governments cannot rely on private sector financial development alone to generate the level of investment needed for economic development. The State needs to play a role, both in stimulating aggregate demand and in directly leading investment through, for example infrastructure programmes. Furthermore, financialisation may be detrimental to investment, because of its effect on the stability and structure of the economy, as discussed in Chapter 2 (Amadeo, 2018). There is a need for government intervention in order to stimulate demand which will bring Investment/GDP up until the threshold value. The government should attempt to use the peak of the curve, not as a goal, but as a warning that further increases in financialisation could have catastrophic effects on performance and growth of the economy (Epstein and Crotty, 2013).

With South Africa following an Orthodox way of thinking, policies such as inflation targeting are pushing South Africa towards increased financial liberalisation. There is a need to look at the comparative perspective for South Africa. The country is coming from a past of poor economic growth and financial sector development, the globalisation and increasing market integration has altered the fabric of the economy (Zalk, 2018). South Africa has become more reliant on foreign inflows as the markets have experienced increasing globalisation (Van Zyl, 2019). This has raised the concern of whether South Africa has exceeded the level of financialisation beneficial to the economy (Pons-Vignon and Segatti, 2013). South Africa relies on foreign investment in order to finance the growth goals of the country. This can pose a threat to the economy as the increasing integration with the global markets increases liquidity, which in turn increases risks and the need to watch the markets more closely (Van Zyl, 2019). Looking at the data for South Africa, there is evidence that the country experiencing the negative aspects of financialisation. With South Africa's average Stock Market Capitalisation/GDP for the period, 2002 to 2017, being 236.43 percent and the most recent 2017 value being 352.16 percent, it is evident that South Africa is lying on the negative portion of the curve. This is supported by Polychroniou (2017), who stated that South Africa is lying on the negatively sloped portion of the curve and therefore being harmed by increasing financialisation. The results of the regression suggest that apart from decreasing investment, which will have negative impacts on the growth for the country, there are increased potential risks to the nation as the volatility of the stock markets mean that there could be an outflow at any given moment depending on investor sentiment. This is a major issue that could, in the future, have detrimental and long-standing negative effects to the economy.

Chapter 5 - Conclusion

With firms now having access to larger pools of capital due to market integration and globalisation, there is a need to take a deeper look at what this could mean for an economy. With financialisation being one of the key components of globalisation, it can be seen as a destabilising force, as it is based on a future that cannot be promised due to uncertainty (Polychroniou, 2017). Although it may be a destabilising force, finance has been proven to be needed for economic growth as there is generally a positive relationship between investment and economic growth (Tyson and Beck, 2018). Over recent times, there has been an ongoing debate as to the impact of financialisation on an economy's growth (Abdul *et al*, 2019). While many economists believe that there is still a positive relationship between financial development and economic growth, the idea is up for debate (Ly-Dai, 2018). The idea has been put forward that there could be the presence of an inverse-U relationship between financialisation and investment.

This study aims at assessing the theoretical literature in support of the inverse-U hypothesis, as well as to empirically test the idea of this hypothesis, through the means of descriptive statistics and a panel OLS regression analysis.

Due to the ease with which foreign finance can flow into emerging markets, there has been increasing competition in the financial sectors. This puts forward the idea of a link between financialisation and development in an economy (Masci, 2008). The Orthodox way of thinking has dominated economic theory for years, this theory is in support of financial liberalisation. Orthodox economists believe there will be an efficient flow of resources between people and institutions over time and that markets will self-correct.

Contrary to the Orthodox view, is the Heterodox view which supports increased government intervention as inefficiencies arise due to market frictions. The Heterodox view suggests that the increasing financial liberalisation increases market volatility, which results in shorter time horizons for profit seeking and loss-minimising parties (Grabel, 1995). There is thus support for both sides to the argument, which gives rise to the research into the inverse-U hypothesis.

This hypothesis is becoming increasingly popular. It supports the idea put forward by many authors, such as Sawyer (2017), Ly-Dai (2016) and Polychroniou (2017) that many emerging market economies are actually lying on the negative portion of the curve. The theory behind the inverse-U hypothesis is that financialisation is beneficial to an economy up until a certain threshold, and upon which further financialisation becomes harmful to the economy in terms of performance and growth. This hypothesis paved the way to empirically test the idea of an inverse-U relationship in both a local and international sense.

The results of the descriptive statistics and the panel OLS model support the theory that there is an inverse-U relationship. The descriptive statistic provide evidence that South Africa has low Investment/GDP compared to its peers. This is supported by the idea put forward by Viegi and Dadam (2018) that South Africa can only increase the size of the economy by integrating into the global economy. In general, investment is not only promoted by increasing exports, but by increasing imports as well. This low level of Investment/GDP coupled with the country having high Stock Market Capitalisation/GDP, is suggestive of a decoupling of finance from the real economy, and the possibility of the country being hurt by financialisation. Therefore, the panel OLS results were generated to further analyse this hypothesis. From these results figure 5, presented in Chapter 4, which analyses Expected Investment/GDP and Stock Market Capitalisation/GDP was generated. This graph supports the idea of an inverse-U relationship. Upon further analysis in the South African context, there is evidence that South Africa has such a high Market Capitalisation/GDP that the country is currently lying on the negatively sloped portion of the curve. This is evidence that South Africa increasing financialisation further will only hurt the economy.

A policy recommendation regarding the results of this study would be that South Africa needs to implement a slightly more Heterodox approach, based off the assumption of a competent State, which is not the case in the country at the moment. Looking at the Orthodox argument, there is an assumption that the liberalised markets will bring about the optimal level and direction of sectoral investment. However, the reality seems to be that financial liberalisation has led increasing financialisation and the decoupling of the financial and real sectors. With this in mind, there is motivation for more Heterodox suggestions. This brings about three policy recommendations below that could be implemented to help reduce or eradicate the negative effects of financialisation.

The policy recommendations put forward should have the aim to either flatten the curve or shift the turning point of the curve further to the right, allowing for further benefits from increased financial development. With financial markets being at the heart of the financialisation process there is a need to restore effective policy control over these markets.

One idea for an effective policy tool is short-term interest rates. However, using interest rate to curtail financial speculation could result in severe collateral damage, this brings forward the idea of combining interest rate policies with a financial sector regulatory framework such as the ABRR (Asset Based Reserve Requirements). Such a policy tool will aim to stabilize financial markets and provide additional tools for monetary policies (Palley, 2007).

A second option that could assist with the issue of financialisation is political reform. There is the need to address the political power of financial and non-financial corporations, addressing this issue will, however, require tackling the problem of lobbying and the influence of wealthy individuals on politics (Palley, 2007). This could require a change in the 'winner-takes-all' arrangements with forms of proportional representation that can give a wider array of voices in policy recommendation and implementation (Palley, 2007).

The final policy recommendation is seen as the most viable option, it is in agreement with Padayachee (2018:3), who states that there were ideas put forward with regards to progressive macroeconomic policy interventions based on a State-led 'crowding in' approach, which aimed to develop a direct contrast to private finance, and market-led 'crowding out', which is aimed to crowd out Orthodoxy. The recommendation would be to attempt to re-table the idea of a macroeconomic policy think tank, such as MERG, which has been identified as, "a powerful state-led social and physical infrastructure investment programme focusing on housing, education, health and physical infrastructure investment as the growth drivers in the first phase, followed by a more sustainable growth phase which would see private-sector investment kick in more forcefully as growth picked up" (Padayachee, 2018:10). The implementation of this idea would allow for slightly more control over the level of financialisation in the country. By implementing these recommendations South Africa will be able to better control the relationship between Investment/GDP and Stock market Capitalisation/GDP, pulling the current position of the economy back to the positive portion of the inverse-U curve. By being on the positive portion of the curve, performance of the economy can be monitored and the peak of the inverse-U curve can be used as a warning that financialisation is getting too high and further controls need to be implemented.

In conclusion, this research article provides support for the idea that there is the existence of an inverse-U hypothesis. As well as the fact that South Africa suffering form from the negative aspects of financialisation. There is a need financialisation to be addressed as with globalisation constantly increasing, the country will continue to move along the negative portion of inverse-U curve, hindering economic growth and development for the nation.

It is important to note that the results of this study are to be treated with the reservation in mind that there is autocorrelation. The opinions and recommendations are that of the author and do not necessarily reflect completely accurate real-world scenarios as they are based on limited data.

Reference List

ABDUL BAHRI, E.N., MD NOR, A.H.S., SARMIDI, T. AND MOHD NOR, N.H.H. (2019). The role of financial development in the relationship between foreign direct investment and economic growth: A Nonlinear Approach. *Review of pacific Basin Financial Markets and Policies* 22(02):1-32.

ABEL, S., NYAMUTOWA, C., MUTONHORI, C. and LE ROUX, P. (2019). Financial sector development and economic growth in the Southern African Development Community region. *Journal of Economic and Financial Sciences* 12(1): a464.

AHMAD, N., LUQMAN, M. and HAYAT, M.F. (2012). Importance of Investment for Economic Growth: Evidence from Pakistan. *Interdisciplinary Journal Of Contemporary Research In Business* 4(4):680-684.

AMADEO, K. (2018). *Emerging Market Countries and their Five Defining Characteristics*. [Online]. Available: https://www.thebalance.com/what-are-emerging-markets-3305927 [Accessed 12 May 2020].

ANWER, S.M. and SAMPATH, R.K. (1999). *Investment and Economic Growth.* Department of Agricultural and Resource Economics. Colorado State University. [Online]. Available: https://core.ac.uk/download/pdf/6494769.pdf [Accessed 8 December 2020].

ASHMAN, A. (2015). *Financialisation and the South African Economy.* Alternative Information & Development Centre (40). [Online]. Available: http://aidc.org.za/financialisation-south-african-economy/ [Accessed 4 November 2020].

BAYRAKTAR, N. (2014). Measuring relative development level of stock markets: Capacity and effort of countries. *Borsa Istanbul Review*: 14(2): 74-95.

BENZINGA, L.R.W. (2011). *Death to the New Monetary Consensus and Quantitative Easing.* Business Insider. [Online]. Available: https://www.businessinsider.com/death-to-the-new-monetary-consensus-and-quantitative-easing-2011-1?IR=T [Accessed 3 March 2020].

BHORAT, H. and HIRSCH, A. (2016). *The Political Economy of Monetary Policy in South Africa: Real Economy Outlooks.* The G-20 and Central Banks in the New World of Unconventional Monetary Policy [Online]. Available: https://www.brookings.edu/wp-content/uploads/2016/07/TT20-south-africa_bhorat_hirsch-2.pdf [Accessed 16 February 2020].

BLINDER, A. (2015). What did we learn from the Financial Crisis, the Great Recession, and the Pathetic Recovery? *The Journal of Economic Education* 46(2): 135-149.

BRAND, R. and KHANYILE, N. (2017). Foreigners desert SA stocks as JSE sees R90bn in outflows. Fin24. [Online]. Available: https://www.news24.com/fin24/Markets/Equities/foreigners-desert-sa-stocks-as-jse-sees-r90bn-in-outflows-20171003 [Accessed 15 July 2020].

BRESSER-PEREIRA, C.L. (2012). Structuralist Macroeconomics and New Developmentalism. *Brazilian Journal of Political Economy* 32(3): 347-366.

BRONER, F. and VENTURA, J. (2011). Rethinking the effects of financial liberalisation. *International Growth Centre* Policy Brief 4005.

CECCHETTI, S. and KHARROUBI, E. (2012). *Reassessing the impact of finance on growth.* Bank for International Settlement, Monetary and Economic Department Working Paper Series 381.

CHEN, W., MRKAIC, M. and NABAR, M. (2019). *The Global Economic Recovery 10 Years after the 2008 Financial Crisis.* International Monetary Fund Working Paper Series 19/83.

CNBC. (2020). *Government response to Moody's downgrade of SA to junk status*. CNBCAfrica. [Online]. Available: https://www.cnbcafrica.com/news/financial/2020/03/28/governments-response-to-moodys-downgrade-of-sa-to-junk-status/ [Accessed 15 July 2020].

COMERT, H. and EPSTEIN, G. (2011). Inflation targeting in South Africa, friend of foe of development? *Economic History of Developing Regions* 26(1): s94-s113.

DIXON, A. and OLIVIA, R. (2020). *Methods of raising capital on the JSE*. Blog Network. [Online]. Available: https://www.financialinstitutionslegalsnapshot.com/2020/07/methods-of-raising-capital-on-the-jse/ [Accessed 25 November 2020].

DOLADO, J.J., JENKINSON, T. and SOSVILLA-RIVERO, S. (1990). Cointegration and Unit Root tests. *Journal of Economic Surveys* 4(3):249-273.

DUTTA, N. and ROY, S. (2009). *The impact of financial Development on Domestic investment: A Quantile regression approach.* Centre for studies in social sciences, Calcutta.

EL-WASSAL, K.A. (2013). *The development of stock markets: In search of Theory*. International Journal of Economics and Financial Issues 3(3): 606-624.

EPSTEIN, G. and CROTTY, J. (2013). *How big is too big? On the social efficiency of the financial sector in the United States.* Political Economy Research Institute Working Paper Series 313.

FITZGERALD, V. (2006). *Financial Development and Economic Growth: A Critical Review*. Oxford University. Background paper for World Economic and Social Survey. [Online]. Available: https://www.un.org/en/development/desa/policy/wess/wess_bg_papers/bp_wess2006_fitzgerald.pdf [Accessed 4 March 2020].

FONTANA, G. (2006). The role of money and interest rates in the role of monetary policy: An attempt at perspective. *History of Economic Ideas* 19(3): 113-134.

FROESTAD, J., NOKLEBERG, M., SHEARING, C. and TROLLIP, H. (2018). *South Africa's Minerals- Energy Complex – Flows, Regulations, Governance and Policing*. Oxford University Press.

FRYER, D. (2016). 'State of the art' or dismal science? The economic debate in South Africa since 1994. *Arts and Humanities in Higher Education* 15(1): 122–139.

FU, X. (2008). *Foreign direct investment, absorptive capacity and regional innovation capabilities: Evidence from China*. OECD Department of International Development, Global Forum on International Investment VII.

GOSSEL, S. and KOELBLE, T. (2020). *The world and South Africa's economy after covid-19.* Daily Maverick. [Online]. Available: https://www.dailymaverick.co.za/article/2020-04-06-everything-has-changed-the-world-and-south-africas-economy-after-covid-19/ [Accessed 4 June 2020].

GOURINCHAS, P.O. and JEANNE, O. (2013). Capital Flows to developing countries: The Allocation Puzzle. *The Review of Economic Studies* 80(4): 1484 – 1515.

GRABEL, I. (1995). Assessing the impact of financial Liberalisation on Stock Market Volatility in selected Developing countries. *Journal of Development Studies* 31(6): 903-917.

GUJARATI, D. and PORTER, D. (2009) *Basic econometrics*. McGraw-Hill, New York.

GURU, K.B. and YADAV, I.S. (2019). Financial development and economic growth: panel evidence from BRICS. *Journal of Economics, Finance and Administrative Science* 24(47):113-126.

HEATH, E. (2008). *Invisible Hand Economics.* Britannica. [Online]. Available: https://www.britannica.com/topic/invisible-hand [Accessed 15 April 2020].

HEIN, E. and TRUGER, A. (2007). *Money, Distribution and Economic Policy. Alternative to orthodox macroeconomics.* Macroeconomic policy institute (IMK), Hans Boeckler foundation, Germany.

IACURCI, G. (2020). *The U.S is in a recession but the stock market marches higher. Here's why there's a disconnect.* CNBC. [Online]. Available: https://www.cnbc.com/2020/06/03/understanding-the-huge-disconnect-between-the-stock-market-and-economy.html [Accessed 18 November 2020].

INTERNATIONAL MONETARY FUND. (2020). T*entative stabilization, sluggish recovery?* World Economic Outlook, January 2020. International Monetary Fund. [Online]. Available: https://www.imf.org/en/Publications/WEO/Issues/2020/01/20/weo-update-january2020 [Accessed 20 April 2020].

ISAACS, G. (2016). *Financialisation and Development: The South African Case Study*. FESSUD FINANCIALISATION, ECONOMY, SOCIETY AND SUSTAINABLE DEVELOPMENT (142).

KABUNDI, A., LOATE, T. and VIEGI, N. (2020). Spillovers of the conventional and unconventional monetary policy from the US to South Africa. *South African Journal of Economics* 88(4):435-471.

KARWOWSKI, E. (2017). *Corporate financialisation in South Africa: From investment strike to housing bubble*. Post Keynesian Economic Study Group. Working Paper 1708. University of Hertfordshire.

KEUPPER, J, 2017. *What are the fragile five? Five emerging markets overly dependent on foreign investment.* The Balance. [Online]. Available at: https://www.thebalance.com/what-are-the-fragile-five-1978880 [Accessed 11 April 2020].

LEVCHENKO, A.A. (2005). Financial Liberalisation and Consumption Volatility in Developing Countries. *International Monetary Fund Staff Papers* 52(2): 237-259.

LY-DAI, H. (2016). *Non-linear pattern of International Capital Flows.* Paris School of Economics, Bielefeld Graduate School of Economics and Management. [Online]. MPRA Paper No. 90236. Available: https://core.ac.uk/download/pdf/211629279.pdf [Accessed 21 June 2020].

LY-DAI, H. (2018). *International Capital Flows in Club of Convergence*. [Online]. HAL archives – ouvertes. HAL Id: hal-01935173. Available: https://hal.archives-ouvertes.fr/hal-01935173/document [Accessed 17 June 2020].

MAHADEVA, L. and ROBINSON, P. (2004). *Unit Root testing to help model building*. Centre of Central Banking Studies. Handbooks in Central Banking No 22.

MASCI, P. (2008). Financial Liberalisation, Economic Growth, Stability and Financial Market Development and Emerging Markets. *Journal of the Washington Institute of China Studies* 3(3):42-61.

MASOOD, O. and FRY, J. (2012). Risk management and Basel-accord-implementation in Pakistan. *Journal of financial Regulation and compliance* 20(3): 293-306.

MAURO, P. (1997). *Why worry about corruption?* International Monetary Fund. Economic Issue (6).

MOHAMED, S. (2019). *The political economy of accumulation in South Africa: Resource extraction, Financialisation, and Capital Flight as Barriers to Investment and Employment Growth*. Doctoral Dissertations 1533. University of Massachusetts Amherst.

MOOSA, I. (2016). International evidence of the financial Kuznets curve. *International Economics* 69(4): 361 – 374.

MUNOZ, J, 2011. *Orthodox versus heterodox perspectives of financial crises: Explosion in the 19990 versus implosion in the 2000's.* Levy Economics Institute of Bard College, Working Paper No.695.

MUYMBIRI, B. and ODHIAMBO, NM. (2018). South Africa's Financial Development and its role in Investment. *Journal of Central Banking Theory and Practice* (1): 101-120

OECD. (2002). *Foreign Direct Investment for Development, maximizing benefits, minimizing costs.* Organisation for economic co-operation and development. OECD Publication Service.

PADAYACHEE, V. (2018). *Beyond a Treasury View of the World*. Southern Centre for Inequality Studies, University of the Witwaterstrand. SCIS Working Paper Number 2.

PALLEY, T.I. (2007). *Financialization: What it is and why it matters*. The Levy Economics Institute of Bard College. Working Paper No.525.

PARK, Y.S., KONGE, L. and ARTINO, A.R. (2020). The Positivism Paradigm of Research. *Academic Medicine* 95(5):690-694.

PETTINGER, T. (2018). *Keynesian economics.* Economics Help. [Online]. Available: https://www.economicshelp.org/blog/6801/economics/keynesian-economics/ [Accessed 17 February 2020].

POLYCHRONIOU, C.J. (2017). *Financialisation has turned the global economy into a house of cards: An Interview with Gerald Epstein*. Truthout. [Online]. Available: https://truthout.org/articles/financialization-has-turned-the-global-economy-into-a-house-of-cards-an-interview-with-gerald-epstein/ [Accessed 8 November 2020].

PONS-VIGNON, N. and SEGATTI, A. (2013). Stuck in stabilisation? South Africa's post-apartheid macro-economic policy between ideological conversion and technocratic capture. *Review of African Political Economy* 40(138): 537-555.

PRASAD, E., RAJAN R. AND SUBRAMANIAN, A. (2006). *Patterns of International Capital Flows and Their Implications for Economic Development.* Research Department IMF. [Online].

Available:
http://prasad.aem.cornell.edu/doc/book_chapters/PatternsofInternationalCapitalFlowsandTheirImplicationsForEconomicDevelopment.pdf [Accessed 4 July 2020].

ROBERTS, L. (2020). *Buffet Indicator: Why investors are walking into a trap*. Seeking Alpha. [Online]. Available: https://seekingalpha.com/article/4389612-buffett-indicator-why-investors-are-walking-trap [Accessed 20 November 2020].

RIBAKOVA, E., HILGENSTOCK, B. and FORTUN, J. (2020). *Macro Notes – 2020 Capital Flows Outlook for Emerging Markets.* Institute of International Finance. [Online]. Available: https://www.iif.com/Portals/0/Files/content/IIF20200408_MN.pdf [Accessed 10 August 2020].

RODRIK, D. and SUBRAMANIAN, A. (2009). Why did financial globalisation disappoint? *IMF Staff Papers* 56(1): 112-138.

RYAN, G. (2018). Introduction to positivism, interpretivism and critical theory. *Nurse Researcher* 25(4):14-20.

SABLE INTERNATIONAL. (2020). *South Africa downgraded to junk status and Rand hits its weakest ever.* The South African. [Online]. Available: https://www.thesouthafrican.com/news/finance/south-africa-downgraded-to-junk-status-and-rand-hits-its-weakest-ever/ [Accessed 29 May 2020].

SAMARGANDI, N., FIDRMUC, J. and GHOSH, S. (2015). Is the Relationship between Financial development and Economic Growth Monotonic? Evidence from a Sample of Middle-Income Countries. *World Development* 68: 16-81.

SANGEETHA, D. (2015). Investment and its role in Economic Development. *International Journal of Science and Research (IJSR)* 4(9):703-706.

SAVAL, N. (2017). *Globalisation: the rise and fall of an idea that swept the world*. The Guardian 14 July. [Online]. Available: https://www.theguardian.com/world/2017/jul/14/globalisation-the-rise-and-fall-of-an-idea-that-swept-the-world [Accessed 20 May 2020].

SAWYER, M. (2017). The processes of financialisation and economic performance. *Economic and Political Studies* 5(1): 5-20.

SHRESTHA, M.B. and BHATTA, G.R. (2018). Selecting appropriate methodological framework for time series data analysis. *The Journal of Finance and Data Science* 4:71-89.

SIDDIQUI, K. (2019). *Corruption and economic mismanagement in developing countries.* The World Financial Review. [Online]. Available: https://worldfinancialreview.com/corruption-and-economic-mismanagement-in-developing-countries/?__cf_chl_jschl_tk__=bae984fc01d099ed2510745152b46f97611f5206-1607365068-0-AaJihNPKyY5eG44lKhKt3ULo_c9LAN6kAObH_1F0Tw2JbAdOFxolcOWDbMsWUEjmq1qtW1lQAspN_nH16mDcka94IWi_xtpQqSMobS_i-gSgRvBr_myR6E1yHzepWtAfze-6Gj3P1OS3vd0MqQevtvXuKkYO0ggbp2c_F8Cdpm2Sn-sKWFc3HWnTfX3VyPWmWSHCUZVc8wmQlmtHV-u7_gmgw2n8YiQ30w93IGKH8EtS3GUxclXewXS1plS4sjhY4c54Yu0tPFyiM_4VtKNLHyVSdDW3bNjpDoaYseh5IEAVCeSpBlLWKrl3rurPD9McFdmAC414cBQGP0aGkuSDpJf-6V_dXnd0PGKLL_GE_shBUQdUaopXepXvJEPP48Hy3IprsZNP3C94lxOCwL4uyZ8 [Accessed 1 November 2020].

SOUTH AFRICAN RESERVE BANK. (2018). *Monetary policy.* South African Reserve Bank. [Online]. Available at: https://www.resbank.co.za/MonetaryPolicy/Pages/MonetaryPolicy-Home.aspx. [Accessed 08 April 2020].

SOUTH AFRICAN RESERVE BANK. (2019). *Monetary Policy Review.* South African Reserve Bank. [Online]. Available: https://www.resbank.co.za/Lists/News%20and%20Publications/Attachments/9206/Monetary%20Policy%20Review%20%E2%80%93%20April%202019.pdf [Accessed 28 June 2020].

SPIEGLER, P. and MILBERG, W. (2013). Historical perspective on the contemporary debate over how to reform economics. *Forum for Social Economics* 42(4): 311-345.

STOCKHAMMER, E. (2010). *Financialisation and the Global Economy. Political Economy Research Institute.* University of Massachusetts Amherst, Working paper Series Number 240.

STORM, S. (2018). Financialisation and Economic Development: A debate on the Social Efficiency of Modern Finance. *Development and Change.* 49(2): 302-329.

THE ECONOMIC TIMES. (2018). *Definition of Market Capitalisation.* The Economic Times. [Online]. Available: https://economictimes.indiatimes.com/definition/market-capitalization [Accessed 7 June 2020].

THE GLOBAL ECONOMY. (2020). [Online]. Available: https://www.theglobaleconomy.com/.

TACHIWOU, A.M. (2010). Stock Market Development and Economic Growth: The case of West African Monetary Union. *International Journal of Economics and Finance* 2(3): 97- 103.

THOMSON, F. and DUTTA, S. (2015). *Financialisation: a primer*. Transnational Institute, Amsterdam.

TORI, D. and ONARAN, O. (2015). *The effects of financialisation on investment: Evidence from firm-level data for the UK.* Greenwich Political Research Centre Paper No GPERC17.

TYSON, J. and BECK, T. (2018). *Capital Flows and financial sector development in low-middle income countries*. DFID-ESGR Growth Research Programme, Synthesis Report October 2018.

VAN ZYL, G. (2019). *Despite JSE blues, best inflows in 10 years for US-traded SA ETF*. Biz News. [Online]. Available: https://www.biznews.com/sa-investing/2019/02/07/despite-jse-blues-best-inflows-in-10yrs-for-us-traded-sa-etf [Accessed 4 July 2020].

VIEGI, N. and DADAM, V. (2018). Investment in South Africa: Opening the Economy to Transform the Society. *The journal of the Helen Suzman Foundation* 82:21-26

WILLIAM, T.G. (2003). *Inflation Targeting: Why is works and How to make it work better?* The Federal reserve bank of St Louis, Working Paper series 027B.

WOODFORD, M. (2012). *Inflation targeting and financial stability*. National Bureau of Economic Research, Working Paper 17967.

WRAY, L.R. (2011). *The dismal state of macroeconomics and the opportunity for a new beginning.* Levy Economics Institute of Bard College. Working paper No 652.

YARTEY, C.A. and ADJASI, C.K. (2007). *Stock Market Development in Sub-Saharan Africa: Critical Issue and Challenges*. International Monetary Fund Working Paper Series WP/07/209. [Online]. Available: https://www.elibrary.imf.org/doc/IMF001/08647-9781451867732/08647-

9781451867732/Other_formats/Source_PDF/08647-9781451912265.pdf [Accessed 10 December 2020].

ZALK. (2018). *Placing structural transformation at the centre of economic revival under the new dawn*. Department of Trade and Industry, Draft Version 5.

Appendix 1

Unit Root Tests

CAP_M_G

Level Terms

Panel unit root test: Summary
Series: CAP_M_G
Date: 01/04/21 Time: 19:17
Sample: 2002 2017
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.31430	0.0000	41	574
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.94253	0.0000	41	574
ADF - Fisher Chi-square	138.932	0.0001	41	574
PP - Fisher Chi-square	238.969	0.0000	41	615

** Probabilities for Fisher tests are computed using an asymptotic Chi
-square distribution. All other tests assume asymptotic normality.

CAP_M_SQ_G

Level Terms

Panel unit root test: Summary
Series: CAP_M_SQ_G
Date: 01/04/21 Time: 19:20
Sample: 2002 2017
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.41780	0.0000	41	574
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.18465	0.0007	41	574
ADF - Fisher Chi-square	130.545	0.0005	41	574
PP - Fisher Chi-square	217.253	0.0000	41	615

** Probabilities for Fisher tests are computed using an asymptotic Chi
-square distribution. All other tests assume asymptotic normality.

ECO

Level Terms

Panel unit root test: Summary
Series: ECO
Date: 01/04/21 Time: 19:22
Sample: 2002 2017
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.74912	0.0000	41	574
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.45865	0.0000	41	574
ADF - Fisher Chi-square	176.171	0.0000	41	574
PP - Fisher Chi-square	281.071	0.0000	41	615

** Probabilities for Fisher tests are computed using an asymptotic Chi
-square distribution. All other tests assume asymptotic normality.

GDP

Level Terms

Panel unit root test: Summary
Series: GDP
Date: 01/05/21 Time: 20:43
Sample: 2002 2017
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	0.33358	0.6307	41	574
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	2.93118	0.9983	41	574
ADF - Fisher Chi-square	64.8182	0.9186	41	574
PP - Fisher Chi-square	72.7735	0.7570	41	615

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

First Differences

Panel unit root test: Summary
Series: D(GDP)
Date: 01/05/21 Time: 20:44
Sample: 2002 2017
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.92596	0.0000	41	533
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.85541	0.0000	41	533
ADF - Fisher Chi-square	166.900	0.0000	41	533
PP - Fisher Chi-square	256.019	0.0000	41	574

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

GOV_S_G

Level Terms

Panel unit root test: Summary
Series: GOV_S_G
Date: 01/05/21 Time: 20:44
Sample: 2002 2017
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.11981	0.0000	41	574
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.49079	0.3118	41	574
ADF - Fisher Chi-square	86.8728	0.3354	41	574
PP - Fisher Chi-square	93.9536	0.1728	41	615

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

First differences

Panel unit root test: Summary
Series: D(GOV_S_G)
Date: 01/05/21 Time: 20:45
Sample: 2002 2017
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-10.4078	0.0000	41	533
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-7.64934	0.0000	41	533
ADF - Fisher Chi-square	203.796	0.0000	41	533
PP - Fisher Chi-square	328.442	0.0000	41	574

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

INF

Level Terms

Panel unit root test: Summary
Series: INF
Date: 01/05/21 Time: 20:46
Sample: 2002 2017
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.17307	0.0000	41	574
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.82648	0.0000	41	574
ADF - Fisher Chi-square	168.283	0.0000	41	574
PP - Fisher Chi-square	237.206	0.0000	41	615

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

INV_G

Level Terms

Panel unit root test: Summary
Series: INV_G
Date: 01/05/21 Time: 20:46
Sample: 2002 2017
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.66052	0.0000	41	574
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.44473	0.0003	41	574
ADF - Fisher Chi-square	131.508	0.0004	41	574
PP - Fisher Chi-square	139.236	0.0001	41	615

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

T_OPN_G

Level Terms

Panel unit root test: Summary
Series: T_OPN_G
Date: 01/05/21 Time: 20:46
Sample: 2002 2017
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.08401	0.0000	41	574
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.45652	0.3240	41	574
ADF - Fisher Chi-square	79.0534	0.5717	41	574
PP - Fisher Chi-square	77.6967	0.6140	41	615

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

First differences

Panel unit root test: Summary
Series: D(T_OPN_G)
Date: 01/05/21 Time: 20:47
Sample: 2002 2017
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-11.9794	0.0000	41	533
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-9.72457	0.0000	41	533
ADF - Fisher Chi-square	245.856	0.0000	41	533
PP - Fisher Chi-square	462.643	0.0000	41	574

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Cointegration Test

Kao Residual Cointegration Test

Kao Residual Cointegration Test
Series: INV_G CAP_M_G CAP_M_SQ_G ECO GDP GOV_S_G INF
T_OPN_G F_CRISIS
Date: 01/12/21 Time: 21:52
Sample: 2002 2017
Included observations: 656
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
User-specified lag length: 1
Newey-West automatic bandwidth selection and Bartlett kernel

	t-Statistic	Prob.
ADF	-2.871305	0.0020
Residual variance	3.962148	
HAC variance	3.068218	

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID)
Method: Least Squares
Date: 01/12/21 Time: 21:52
Sample (adjusted): 2004 2017
Included observations: 574 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.372285	0.036514	-10.19562	0.0000
D(RESID(-1))	-0.007927	0.041447	-0.191266	0.8484

R-squared	0.182971	Mean dependent var	-0.049466
Adjusted R-squared	0.181542	S.D. dependent var	2.156557
S.E. of regression	1.951008	Akaike info criterion	4.178048
Sum squared resid	2177.280	Schwarz criterion	4.193214
Log likelihood	-1197.100	Hannan-Quinn criter.	4.183963
Durbin-Watson stat	2.035815		

Autoregressive Distributed Lag Model (ARDL)

ARDL 1

Dependent Variable: D(INV_G)
Method: ARDL
Date: 01/12/21 Time: 16:40
Sample: 2003 2017
Included observations: 615
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic): CAP_M_G CAP_M_SQ_G
Fixed regressors: C
Number of models evalulated: 1
Selected Model: ARDL(1, 1, 1)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
	Long Run Equation			
CAP_M_G	0.469776	0.041013	11.45442	0.0000
CAP_M_SQ_G	-0.001681	0.000200	-8.405400	0.0000
	Short Run Equation			
COINTEQ01	-0.224391	0.034291	-6.543754	0.0000
D(CAP_M_G)	-0.100235	0.078783	-1.272280	0.2039
D(CAP_M_SQ_G)	-0.001686	0.002832	-0.595605	0.5517
C	1.218052	0.554006	2.198624	0.0284

Root MSE	1.632898	Mean dependent var	0.051431
S.D. dependent var	2.234974	S.E. of regression	1.889352
Akaike info criterion	3.629985	Sum squared resid	1749.130
Schwarz criterion	4.765202	Log likelihood	-1024.635
Hannan-Quinn criter.	4.070123		

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

ARDL 2

Dependent Variable: D(INV_G)
Method: ARDL
Date: 01/12/21 Time: 16:41
Sample: 2003 2017
Included observations: 615
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic): CAP_M_G CAP_M_SQ_G ECO GDP GOV_S_G INF T_OPN_G
Fixed regressors: C
Number of models evalulated: 1
Selected Model: ARDL(1, 1, 1, 1, 1, 1, 1, 1)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
	Long Run Equation			
CAP_M_G	-0.062531	0.005818	-10.74757	0.0000
	0.000147	1.64E-05	8.944375	0.0000
ECO	0.293739	0.146986	1.998419	0.0466
GDP	3.69E-05	2.56E-05	1.441986	0.1504
GOV_S_G	0.759701	0.067604	11.23755	0.0000
INF	0.082029	0.037360	2.195656	0.0289
T_OPN_G	-0.018581	0.002487	-7.470544	0.0000
	Short Run Equation			
COINTEQ01	-0.330795	0.054866	-6.029181	0.0000
D(CAP_M_G)	-0.040716	0.076439	-0.532665	0.5947
D(CAP_M_SQ_G)	-6.19E-05	0.001811	-0.034163	0.9728
D(ECO)	-0.060153	0.049732	-1.209537	0.2275
D(GDP)	0.004550	0.001789	2.542971	0.0115
D(GOV_S_G)	-0.004202	0.332724	-0.012629	0.9899
D(INF)	-0.060643	0.051504	-1.177438	0.2400
D(T_OPN_G)	0.052801	0.017612	2.998042	0.0030
C	4.172278	0.921990	4.525298	0.0000

Root MSE	0.966257	Mean dependent var	0.051431
S.D. dependent var	2.234974	S.E. of regression	1.478991
Akaike info criterion	2.704597	Sum squared resid	612.4759
Schwarz criterion	5.275933	Log likelihood	-511.1077
Hannan-Quinn criter.	3.701536		

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

<u>**Ordinary Least Squares (OLS)**</u>

SET 1:

Fixed Effects Model

Dependent Variable: INV_G
Method: Panel Least Squares
Date: 01/12/21   Time: 16:17
Sample: 2002 2017
Periods included: 16
Cross-sections included: 41
Total panel (balanced) observations: 656

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAP_M_G	0.060216	0.011281	5.337850	0.0000
CAP_M_SQ_G	-0.000139	3.40E-05	-4.087736	0.0000
C	20.56752	0.571133	36.01177	0.0000

Effects Specification

Cross-section fixed (dummy variables)

Root MSE	2.861064	R-squared	0.643701
Mean dependent var	23.64165	Adjusted R-squared	0.619289
S.D. dependent var	4.796798	S.E. of regression	2.959711
Akaike info criterion	5.071362	Sum squared resid	5369.812
Schwarz criterion	5.365424	Log likelihood	-1620.407
Hannan-Quinn criter.	5.185374	F-statistic	26.36818
Durbin-Watson stat	0.710352	Prob(F-statistic)	0.000000

Random Effects Model

Dependent Variable: INV_G
Method: Panel EGLS (Cross-section random effects)
Date: 01/12/21 Time: 16:20
Sample: 2002 2017
Periods included: 16
Cross-sections included: 41
Total panel (balanced) observations: 656
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAP_M_G	0.045805	0.010441	4.386882	0.0000
CAP_M_SQ_G	-0.000113	3.28E-05	-3.448414	0.0006
C	21.36741	0.788394	27.10244	0.0000

Effects Specification

	S.D.	Rho
Cross-section random	3.797445	0.6221
Idiosyncratic random	2.959711	0.3779

Weighted Statistics

Root MSE	2.974163	R-squared	0.029576
Mean dependent var	4.521514	Adjusted R-squared	0.026604
S.D. dependent var	3.021450	S.E. of regression	2.980987
Sum squared resid	5802.744	F-statistic	9.950958
Durbin-Watson stat	0.619683	Prob(F-statistic)	0.000055

Unweighted Statistics

R-squared	-0.107074	Mean dependent var	23.64165
Sum squared resid	16684.79	Durbin-Watson stat	0.215517

Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	11.422101	2	0.0033

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CAP_M_G	0.060216	0.045805	0.000018	0.0007
CAP_M_SQ_G	-0.000139	-0.000113	0.000000	0.0031

Cross-section random effects test equation:
Dependent Variable: INV_G
Method: Panel Least Squares
Date: 01/12/21 Time: 16:20
Sample: 2002 2017
Periods included: 16
Cross-sections included: 41
Total panel (balanced) observations: 656

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	20.56752	0.571133	36.01177	0.0000
CAP_M_G	0.060216	0.011281	5.337850	0.0000
CAP_M_SQ_G	-0.000139	3.40E-05	-4.087736	0.0000

Effects Specification

Cross-section fixed (dummy variables)

Root MSE	2.861064	R-squared	0.643701
Mean dependent var	23.64165	Adjusted R-squared	0.619289
S.D. dependent var	4.796798	S.E. of regression	2.959711
Akaike info criterion	5.071362	Sum squared resid	5369.812
Schwarz criterion	5.365424	Log likelihood	-1620.407
Hannan-Quinn criter.	5.185374	F-statistic	26.36818
Durbin-Watson stat	0.710352	Prob(F-statistic)	0.000000

SET 2

Fixed Effects Model

Dependent Variable: INV_G
Method: Panel Least Squares
Date: 01/12/21 Time: 16:22
Sample: 2002 2017
Periods included: 16
Cross-sections included: 41
Total panel (balanced) observations: 656

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAP_M_G	0.041074	0.010654	3.855309	0.0001
CAP_M_SQ_G	-0.000120	3.14E-05	-3.823410	0.0001
ECO	0.202781	0.042290	4.795033	0.0000
GDP	0.000358	4.62E-05	7.759628	0.0000
GOV_S_G	-0.156340	0.081471	-1.918965	0.0555
INF	0.168977	0.041564	4.065490	0.0001
T_OPN_G	-0.028738	0.007236	-3.971377	0.0001
C	16.16379	2.071796	7.801827	0.0000

Effects Specification

Cross-section fixed (dummy variables)

Root MSE	2.612472	R-squared	0.702927
Mean dependent var	23.64165	Adjusted R-squared	0.679963
S.D. dependent var	4.796798	S.E. of regression	2.713637
Akaike info criterion	4.904812	Sum squared resid	4477.206
Schwarz criterion	5.233068	Log likelihood	-1560.778
Hannan-Quinn criter.	5.032081	F-statistic	30.60927
Durbin-Watson stat	0.722306	Prob(F-statistic)	0.000000

Random Effects Model

Dependent Variable: INV_G
Method: Panel EGLS (Cross-section random effects)
Date: 01/12/21 Time: 16:22
Sample: 2002 2017
Periods included: 16
Cross-sections included: 41
Total panel (balanced) observations: 656
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAP_M_G	0.031133	0.009738	3.197187	0.0015
CAP_M_SQ_G	-9.01E-05	3.02E-05	-2.982102	0.0030
ECO	0.240765	0.040896	5.887271	0.0000
GDP	6.32E-05	1.97E-05	3.200929	0.0014
GOV_S_G	-0.222209	0.065316	-3.402086	0.0007
INF	0.180267	0.040511	4.449850	0.0000
T_OPN_G	-0.017231	0.004966	-3.469441	0.0006
C	24.66737	1.481129	16.65443	0.0000

Effects Specification

	S.D.	Rho
Cross-section random	2.975970	0.5460
Idiosyncratic random	2.713637	0.4540

Weighted Statistics

Root MSE	2.829389	R-squared	0.139171
Mean dependent var	5.254602	Adjusted R-squared	0.129872
S.D. dependent var	3.051867	S.E. of regression	2.846801
Sum squared resid	5251.569	F-statistic	14.96616
Durbin-Watson stat	0.605968	Prob(F-statistic)	0.000000

Unweighted Statistics

R-squared	0.097871	Mean dependent var	23.64165
Sum squared resid	13596.05	Durbin-Watson stat	0.234059

Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	72.157655	7	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CAP_M_G	0.041074	0.031133	0.000019	0.0215
CAP_M_SQ_G	-0.000120	-0.000090	0.000000	0.0005
ECO	0.202781	0.240765	0.000116	0.0004
GDP	0.000358	0.000063	0.000000	0.0000
GOV_S_G	-0.156340	-0.222209	0.002371	0.1762
INF	0.168977	0.180267	0.000086	0.2246
T_OPN_G	-0.028738	-0.017231	0.000028	0.0288

Cross-section random effects test equation:
Dependent Variable: INV_G
Method: Panel Least Squares
Date: 01/12/21 Time: 16:23
Sample: 2002 2017
Periods included: 16
Cross-sections included: 41
Total panel (balanced) observations: 656

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.16379	2.071796	7.801827	0.0000
CAP_M_G	0.041074	0.010654	3.855309	0.0001
CAP_M_SQ_G	-0.000120	3.14E-05	-3.823410	0.0001
ECO	0.202781	0.042290	4.795033	0.0000
GDP	0.000358	4.62E-05	7.759628	0.0000
GOV_S_G	-0.156340	0.081471	-1.918965	0.0555
INF	0.168977	0.041564	4.065490	0.0001
T_OPN_G	-0.028738	0.007236	-3.971377	0.0001

Effects Specification

Cross-section fixed (dummy variables)

Root MSE	2.612472	R-squared	0.702927
Mean dependent var	23.64165	Adjusted R-squared	0.679963
S.D. dependent var	4.796798	S.E. of regression	2.713637
Akaike info criterion	4.904812	Sum squared resid	4477.206
Schwarz criterion	5.233068	Log likelihood	-1560.778
Hannan-Quinn criter.	5.032081	F-statistic	30.60927
Durbin-Watson stat	0.722306	Prob(F-statistic)	0.000000

SET 3

Fixed Effects Model

---Near singular Matrix

Random Effects Model

Dependent Variable: INV_G
Method: Panel EGLS (Cross-section random effects)
Date: 01/12/21 Time: 16:24
Sample: 2002 2017
Periods included: 16
Cross-sections included: 41
Total panel (balanced) observations: 656
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAP_M_G	0.032171	0.009607	3.348512	0.0009
CAP_M_SQ_G	-9.56E-05	2.98E-05	-3.209577	0.0014
ECO	0.226531	0.041210	5.497038	0.0000
GDP	0.000110	2.50E-05	4.427602	0.0000
GOV_S_G	-0.184099	0.066243	-2.779129	0.0056
INF	0.163869	0.041141	3.983082	0.0001
T_OPN_G	-0.016807	0.004916	-3.418755	0.0007
F_CRISIS	-0.223021	0.237341	-0.939666	0.3477
HDI_V	-3.919891	1.310546	-2.991037	0.0029
C	25.23442	1.479158	17.05999	0.0000

Effects Specification

	S.D.	Rho
Cross-section random	2.940941	0.5489
Idiosyncratic random	2.666132	0.4511

Weighted Statistics

Root MSE	2.810793	R-squared	0.149734
Mean dependent var	5.225601	Adjusted R-squared	0.137889
S.D. dependent var	3.050583	S.E. of regression	2.832465
Sum squared resid	5182.765	F-statistic	12.64029
Durbin-Watson stat	0.600774	Prob(F-statistic)	0.000000

Unweighted Statistics

R-squared	0.044705	Mean dependent var	23.64165
Sum squared resid	14397.32	Durbin-Watson stat	0.216267

Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	90.118668	8	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CAP_M_G	0.046303	0.032171	0.000018	0.0010
CAP_M_SQ_G	-0.000134	-0.000096	0.000000	0.0000
ECO	0.147877	0.226531	0.000160	0.0000
F_CRISIS	-1.302544	-0.223021	0.017888	0.0000
GDP	0.000478	0.000110	0.000000	0.0000
GOV_S_G	-0.037955	-0.184099	0.002632	0.0044
INF	0.118779	0.163869	0.000085	0.0000
T_OPN_G	-0.024454	-0.016807	0.000027	0.1424

Cross-section random effects test equation:
Dependent Variable: INV_G
Method: Panel Least Squares
Date: 01/23/21 Time: 13:39
Sample: 2002 2017
Periods included: 16
Cross-sections included: 41
Total panel (balanced) observations: 656
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.15912	2.288896	4.875330	0.0000
CAP_M_G	0.046303	0.010524	4.399595	0.0000
CAP_M_SQ_G	-0.000134	3.10E-05	-4.306758	0.0000
ECO	0.147877	0.043107	3.430442	0.0006
F_CRISIS	-1.302544	0.272432	-4.781176	0.0000
GDP	0.000478	5.18E-05	9.225120	0.0000
GOV_S_G	-0.037955	0.083787	-0.452997	0.6507
HDI_V	NA	NA	NA	NA
INF	0.118779	0.042164	2.817039	0.0050
T_OPN_G	-0.024454	0.007166	-3.412655	0.0007

Effects Specification

Cross-section fixed (dummy variables)

Root MSE	2.564626	R-squared	0.713709
Mean dependent var	23.64165	Adjusted R-squared	0.691070
S.D. dependent var	4.796798	S.E. of regression	2.666132

Akaike info criterion	4.870893	Sum squared resid	4314.714
Schwarz criterion	5.205987	Log likelihood	-1548.653
Hannan-Quinn criter.	5.000813	F-statistic	31.52540
Durbin-Watson stat	0.704705	Prob(F-statistic)	0.000000

SET 4

Fixed Effects Model

Dependent Variable: INV_G
Method: Panel Least Squares
Date: 01/12/21 Time: 16:25
Sample: 2002 2017
Periods included: 16
Cross-sections included: 41
Total panel (balanced) observations: 656

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAP_M_G	0.046303	0.010524	4.399595	0.0000
CAP_M_SQ_G	-0.000134	3.10E-05	-4.306758	0.0000
ECO	0.147877	0.043107	3.430442	0.0006
GDP	0.000478	5.18E-05	9.225120	0.0000
GOV_S_G	-0.037955	0.083787	-0.452997	0.6507
INF	0.118779	0.042164	2.817039	0.0050
T_OPN_G	-0.024454	0.007166	-3.412655	0.0007
F_CRISIS	-1.302544	0.272432	-4.781176	0.0000
C	11.15912	2.288896	4.875330	0.0000

Effects Specification

Cross-section fixed (dummy variables)

Root MSE	2.564626	R-squared	0.713709
Mean dependent var	23.64165	Adjusted R-squared	0.691070
S.D. dependent var	4.796798	S.E. of regression	2.666132
Akaike info criterion	4.870893	Sum squared resid	4314.714
Schwarz criterion	5.205987	Log likelihood	-1548.653
Hannan-Quinn criter.	5.000813	F-statistic	31.52540
Durbin-Watson stat	0.704705	Prob(F-statistic)	0.000000

Random Effects Model

Dependent Variable: INV_G
Method: Panel EGLS (Cross-section random effects)
Date: 01/12/21 Time: 16:27
Sample: 2002 2017
Periods included: 16
Cross-sections included: 41
Total panel (balanced) observations: 656
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAP_M_G	0.031635	0.009621	3.288240	0.0011
CAP_M_SQ_G	-9.11E-05	2.98E-05	-3.061766	0.0023
ECO	0.238025	0.041033	5.800779	0.0000
GDP	6.53E-05	1.97E-05	3.307808	0.0010
GOV_S_G	-0.219133	0.065452	-3.348016	0.0009
INF	0.176981	0.040904	4.326746	0.0000
T_OPN_G	-0.017289	0.004945	-3.495922	0.0005
F_CRISIS	-0.061347	0.230909	-0.265678	0.7906
C	24.58798	1.472803	16.69468	0.0000

Effects Specification		S.D.	Rho
Cross-section random		2.978653	0.5552
Idiosyncratic random		2.666132	0.4448

Weighted Statistics			
Root MSE	2.825173	R-squared	0.139453
Mean dependent var	5.162615	Adjusted R-squared	0.128812
S.D. dependent var	3.047817	S.E. of regression	2.844755
Sum squared resid	5235.931	F-statistic	13.10587
Durbin-Watson stat	0.605937	Prob(F-statistic)	0.000000

Unweighted Statistics			
R-squared	0.087315	Mean dependent var	23.64165
Sum squared resid	13755.14	Durbin-Watson stat	0.230652

Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	96.598119	8	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CAP_M_G	0.046303	0.031635	0.000018	0.0006
CAP_M_SQ_G	-0.000134	-0.000091	0.000000	0.0000
ECO	0.147877	0.238025	0.000174	0.0000
GDP	0.000478	0.000065	0.000000	0.0000
GOV_S_G	-0.037955	-0.219133	0.002736	0.0005
INF	0.118779	0.176981	0.000105	0.0000
T_OPN_G	-0.024454	-0.017289	0.000027	0.1670
F_CRISIS	-1.302544	-0.061347	0.020900	0.0000

Cross-section random effects test equation:
Dependent Variable: INV_G
Method: Panel Least Squares
Date: 01/12/21 Time: 16:27
Sample: 2002 2017
Periods included: 16
Cross-sections included: 41
Total panel (balanced) observations: 656

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.15912	2.288896	4.875330	0.0000
CAP_M_G	0.046303	0.010524	4.399595	0.0000
CAP_M_SQ_G	-0.000134	3.10E-05	-4.306758	0.0000
ECO	0.147877	0.043107	3.430442	0.0006
GDP	0.000478	5.18E-05	9.225120	0.0000
GOV_S_G	-0.037955	0.083787	-0.452997	0.6507
INF	0.118779	0.042164	2.817039	0.0050
T_OPN_G	-0.024454	0.007166	-3.412655	0.0007
F_CRISIS	-1.302544	0.272432	-4.781176	0.0000

Effects Specification

Cross-section fixed (dummy variables)

Root MSE	2.564626	R-squared	0.713709
Mean dependent var	23.64165	Adjusted R-squared	0.691070
S.D. dependent var	4.796798	S.E. of regression	2.666132
Akaike info criterion	4.870893	Sum squared resid	4314.714
Schwarz criterion	5.205987	Log likelihood	-1548.653

Hannan-Quinn criter.	5.000813	F-statistic	31.52540
Durbin-Watson stat	0.704705	Prob(F-statistic)	0.000000

SET 5

Fixed Effects Model

– Near Singular Matrix

Random Effects Model

Dependent Variable: INV_G
Method: Panel EGLS (Cross-section random effects)
Date: 01/12/21   Time: 16:28
Sample: 2002 2017
Periods included: 16
Cross-sections included: 41
Total panel (balanced) observations: 656
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAP_M_G	0.031130	0.009721	3.202333	0.0014
CAP_M_SQ_G	-9.33E-05	3.02E-05	-3.087615	0.0021
ECO	0.235475	0.040927	5.753519	0.0000
GDP	0.000103	2.45E-05	4.206611	0.0000
GOV_S_G	-0.196922	0.065688	-2.997829	0.0028
INF	0.174078	0.040562	4.291684	0.0000
T_OPN_G	-0.017063	0.004935	-3.457247	0.0006
HDI_V	-3.545547	1.277028	-2.776404	0.0057
C	25.32719	1.490922	16.98761	0.0000

Effects Specification

	S.D.	Rho
Cross-section random	2.938224	0.5397
Idiosyncratic random	2.713637	0.4603

Weighted Statistics

Root MSE	2.816927	R-squared	0.148335
Mean dependent var	5.318710	Adjusted R-squared	0.137805
S.D. dependent var	3.054728	S.E. of regression	2.836451
Sum squared resid	5205.410	F-statistic	14.08609
Durbin-Watson stat	0.606046	Prob(F-statistic)	0.000000

Unweighted Statistics

R-squared	0.071237	Mean dependent var	23.64165
Sum squared resid	13997.45	Durbin-Watson stat	0.225378

Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	66.889245	7	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CAP_M_G	0.041074	0.031130	0.000019	0.0226
CAP_M_SQ_G	-0.000120	-0.000093	0.000000	0.0018
ECO	0.202781	0.235475	0.000113	0.0021
GDP	0.000358	0.000103	0.000000	0.0000
GOV_S_G	-0.156340	-0.196922	0.002323	0.3998
INF	0.168977	0.174078	0.000082	0.5739
T_OPN_G	-0.028738	-0.017063	0.000028	0.0274

Cross-section random effects test equation:
Dependent Variable: INV_G
Method: Panel Least Squares
Date: 01/23/21 Time: 13:40
Sample: 2002 2017
Periods included: 16
Cross-sections included: 41
Total panel (balanced) observations: 656
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.16379	2.071796	7.801827	0.0000
CAP_M_G	0.041074	0.010654	3.855309	0.0001
CAP_M_SQ_G	-0.000120	3.14E-05	-3.823410	0.0001
ECO	0.202781	0.042290	4.795033	0.0000
GDP	0.000358	4.62E-05	7.759628	0.0000
GOV_S_G	-0.156340	0.081471	-1.918965	0.0555
HDI_V	NA	NA	NA	NA
INF	0.168977	0.041564	4.065490	0.0001
T_OPN_G	-0.028738	0.007236	-3.971377	0.0001

Effects Specification

Cross-section fixed (dummy variables)

Root MSE	2.612472	R-squared	0.702927
Mean dependent var	23.64165	Adjusted R-squared	0.679963
S.D. dependent var	4.796798	S.E. of regression	2.713637
Akaike info criterion	4.904812	Sum squared resid	4477.206
Schwarz criterion	5.233068	Log likelihood	-1560.778

Hannan-Quinn criter.	5.032081	F-statistic	30.60927
Durbin-Watson stat	0.722306	Prob(F-statistic)	0.000000

Correlogram-Q-Statistic

Date: 01/24/21 Time: 17:36
Sample: 2002 2017
Included observations: 656

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|******|	.|******|	1	0.839	0.839	463.63	0.000
.|***** |	.|. |	2	0.697	-0.022	784.23	0.000
.|**** |	.|. |	3	0.579	0.001	1006.0	0.000
.|**** |	.|. |	4	0.486	0.014	1162.1	0.000
.|*** |	.|. |	5	0.400	-0.026	1268.0	0.000
.|** |	.|. |	6	0.327	-0.005	1338.9	0.000
.|** |	.|. |	7	0.271	0.015	1387.9	0.000
.|** |	.|. |	8	0.218	-0.027	1419.6	0.000
.|* |	.|. |	9	0.179	0.017	1441.0	0.000
.|* |	.|. |	10	0.153	0.017	1456.6	0.000
.|* |	.|. |	11	0.126	-0.016	1467.2	0.000
.|* |	.|. |	12	0.099	-0.013	1473.7	0.000
.|. |	.|. |	13	0.069	-0.029	1476.9	0.000
.|. |	.|. |	14	0.044	-0.010	1478.2	0.000
.|. |	.|. |	15	0.023	-0.004	1478.6	0.000