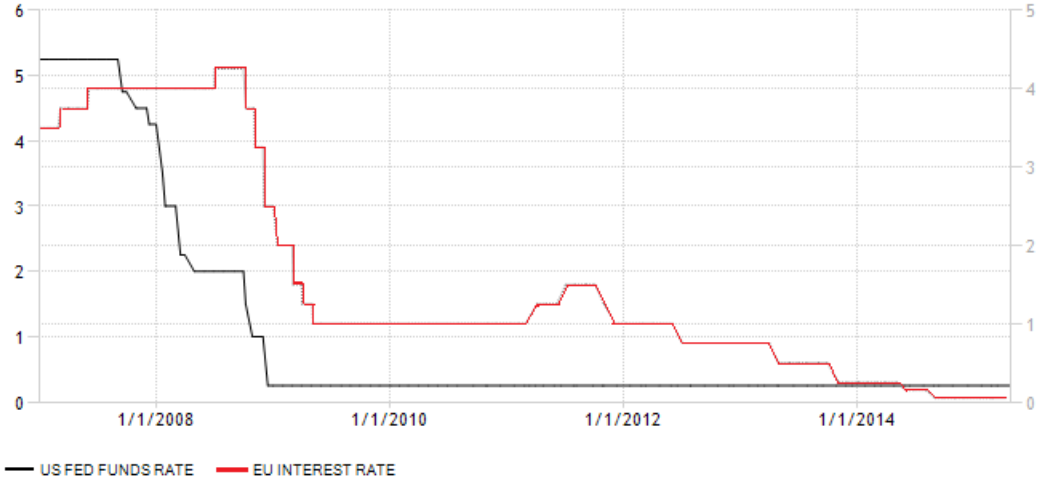
How South African policy makers should react to the normalisation of monetary policy in the US as well as the impact of QE in the Eurozone.
Word count: 3712 (including in-text references and figures but excluding list of references)

1. *Quantitative easing: The most conventional unconventional monetary policy response to the 2008 financial crisis.*

Short-term nominal interest rates are at historical lows in both the United States (US) as well as the European Union (EU) (Kapetanios et al. 2012). In response to the recent financial crisis of 2008, with rising concerns of heightened unemployment and deflation due to weakening aggregate demand, the US Federal Reserve (the Fed) as well as the European Central Bank (ECB) have undertaken large-scale asset purchase (LSAP) programmes or more commonly known as quantitative easing (QE). QE is typically financed by the creation of excess reserves via the balance sheet of a central bank. The Fed and more recently the ECB, purchase long term treasury and agency bonds and in exchange create deposits to holders of these securities. These deposits are transmitted through commercial banks onto the now previous holders of long term securities. Therefore, QE is intended to put downward pressure on long-term interest rates and more generally to improve overall financial conditions. According to Martin and Milas (2012), more favourable financial conditions would, in turn, help boost aggregate demand and check undesirable deflationary pressures by providing increased support for consumer spending, financial market stability, business investment and net exports.

Thus, the objective of these two QE programmes is to stimulate aggregate economic activity during periods when traditional monetary policy instruments (the short-term nominal interest rate) are unfeasible due to the zero bound constraint (Fawley and Neely 2013). The Fed and the ECB have provided forward guidance communicating their intention to maintain the Fed funds rate and the ECB rate near zero for a protracted period of time, conditioned on certain parameters related to unemployment and inflation expectations. Figure 1 depicts that short-term nominal interest rates in both the US and EU remained consistently low following the 2008 financial crisis.

Figure1: Short-term nominal interest rates in the US & EU



Source: www.tradingeconomics.com

With historically low interest rates and ample liquidity, particularly in the US, QE has helped drive capital flows into many fast growing emerging markets (EMs) over the past few years (2008-2015) through channels such as global liquidity and global portfolio rebalancing. These channels encourage investors to seek higher returns in emerging markets by transferring liquidity to relatively higher interest bearing markets than that of the US and EU. Portfolio rebalancing transfers have economic implications such as an appreciation of foreign currencies which can erode export competitiveness with foreign countries. Increased portfolio flows also put somewhat unwelcome upward pressure on asset prices, potentially creating asset bubbles due to increased demand for financial assets and a greater risk appetite of foreign investors (Lavigne et al. 2014). Evidence also shows that investment driven African countries, like South Africa, which are more integrated into global financial markets, are relatively more exposed to the effects of QE than the rest of Africa (Bouraoui 2015).

Even with active debate in the international business community on the global repercussions and risks of QE, particularly in relation to excessive capital flows to EMs, little research has been dedicated to the international spill-overs of QE on South Africa. Understanding the international spill-overs of this unconventional policy is particularly relevant considering SA's weakened growth prospects and high unemployment, as one major central bank, the Fed, is discussing the tapering of its quantitative easing program which consists of two main components: first, decreasing and ultimately ending asset purchases and second, increasing the Fed funds rate whilst the ECB, has more recently begun their quantitative easing programme. With this in mind, I provide an empirical analysis of the link between QE tapering in the US and QE expansion in the EU on economic growth in South Africa and then suggest recommendations for policy makers to address these negative effects of both QE programmes in order to cushion the potentially adverse impact on economic growth in South Africa.

2. *The impact of tapering in the USA on South Africa*

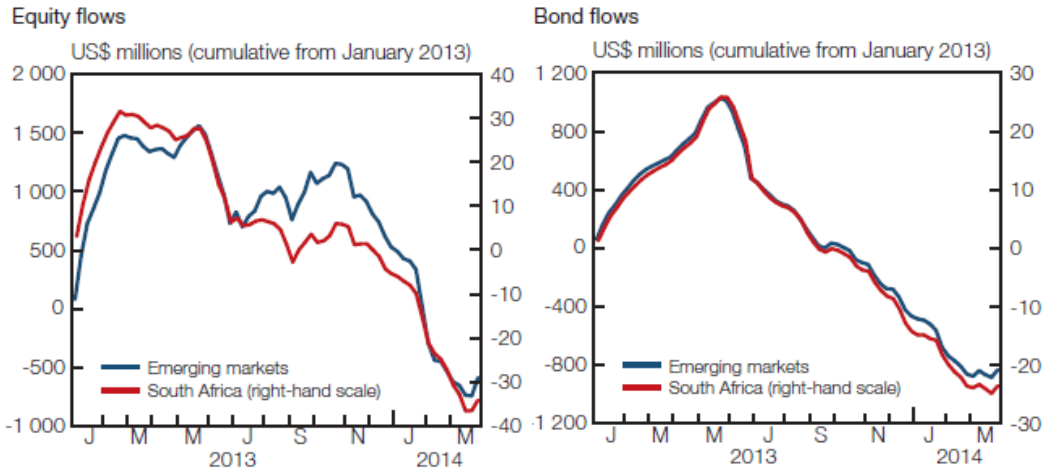
Against conditions of a stronger economic recovery in the US, the Fed began speaking about prospects to steadily unwind its unconventional monetary policy in May and June 2013. Unconventional monetary policy by the Fed was not anticipated to last forever and talk of reducing or "tapering" the quantity of its LSAP programme surprised markets. The tapering of QE, and the months that followed, continued to impact on the pattern of global capital flows and the intensity of financial market volatility in EMs. Sharp market corrections ensued in South Africa, including a slowdown in foreign capital inflows, a sharp depreciation of the rand against the dollar, and declining equity prices. Moving forward, the extent of the impact on EMs will be essentially determined by uncertainty about the manner in which monetary policy normalisation is implemented by the Fed (SARB, 2014).

2.1 Capital flows out

From 1994, net capital inflows have helped to relieve low domestic savings and have had a strong impact on sustained economic growth in South Africa (Aron et al. 2010). Increased openness to capital flows also meant that South Africa has become vulnerable to external shocks in the form of surges and reversal of foreign capital flows, most recently due to QE. Since the start of QE, capital inflows into South Africa from the US have been dominated by

portfolio investment. However, during the “taper talk” phase, South Africa saw portfolio investment outflows due to a revision in expectations of long-term interest rates in the US. Increasing long-term interest rates signalled a portfolio rebalance from risky to safer asset allocation. Capital flowed out by a sell-off of South African financial assets, mainly bonds and equities. Figure 2 depicts this sell-off of bonds and equities in South Africa compared to other EMs. From May 2013 to February 2014 South Africa faced declining portfolio flows following “taper talk” by the Fed.

Figure 2: Cumulative Equity and Bond flows for South Africa and EMs



Source: Financial Stability Review, SARB (2014)

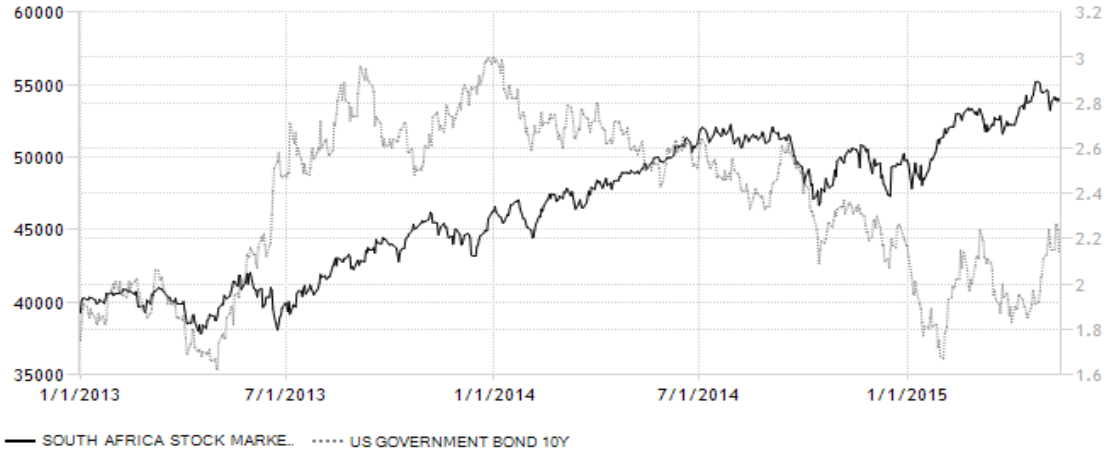
These capital outflows from EMs raised financial stability concerns, particularly in South Africa, which is dependent on foreign capital inflows (Aron et al. 2010). This is because foreign capital addresses the shortfall of available domestic savings to fund investment needs for business expansion and job creation. According to (finweek), South Africa doesn't compare well to BRICS countries and has the lowest savings rate of 13.5% with a household savings rate of only 1.7% further highlighting the need of foreign capital inflows. There are also concerns that sudden reversals of capital inflows could destabilise asset and financial markets in South Africa causing asset prices to fall.

2.2 The JSE

The Johannesburg Securities Exchange (JSE) is the largest securities exchange in Africa and is an entryway to foreign investment into South Africa and the continent alike (Rossouw et al. 2002) The JSE all share index has been trending upwards since 2012 and reaching an all time high above 55000 points in 2015. During “taper talk” and tapering alike, the all share index declined after revised expectations of economic recovery in the US.

Figure 3 shows when 10 year US government bond yields increase in June 2013, the all share index trends moderately low and when yields revert back to June 2013 yields, the all share index begins to trend upwards to a high above 55000 points.

Figure 3: 10 year US government bond yield and the all share index



Source: www.tradingeconomics.com

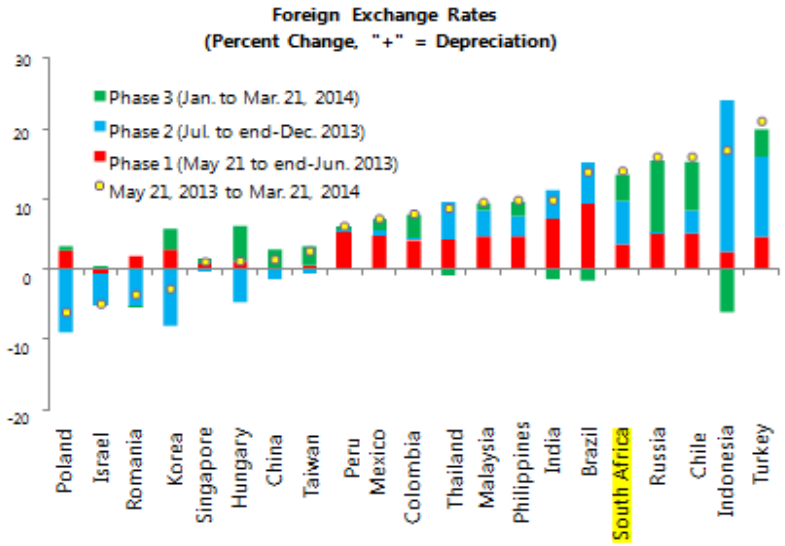
Foreign investors sold-off domestic security holdings and transferred their liquidity into US bonds and stocks. As expectations are revised and domestic financial assets sold-off, the rand will weaken relative to the US dollar. This volatile fluctuation in equity markets is undesirable for South Africa and can cause equity prices to fluctuate rapidly during QE. Caballero and Krishnamurthy (2006) provide insight on fluctuating asset prices and found that in emerging markets a shortage of savings and reliance on foreign capital contributed to financial market volatility. Caballero and Krishnamurthy also found capital flows reverse and the domestic currency weakens as negative fluctuations persist.

2.3 The Rand Vs. The US Dollar

As it currently stands, a stable rand/dollar exchange rate has become increasingly important to ensure sustained economic growth in the long-run. Economic growth is not solely determined by a stable rand/dollar exchange rate but does play a major role in sound macroeconomic variables in South Africa as Shah (2009) found that "excessive exchange rate volatility against the dollar has a deleterious effect on international financial flows, external trade, and economic output."

The rand has proven to be one of the most volatile emerging-market currencies against the backdrop of US tapering, second to the Russian ruble in BRICS countries. Between May 21 (2013) and March 21 (2014), currencies across BRICS countries depreciated against the US dollar. On average, currencies across EMs depreciated by 5% between May 21 and June 30 (2013). Figure 3 below shows how the rand depreciated by 3% during phase 1 of “taper talk” and over 13% by the end of phase 3. This depreciation was then followed by greater differentiation during the second half of 2013. According to Sahay et al. (2014) the differentiation seems to be based on economic fundamentals, including external and macroeconomic imbalances (current account deficit, budget deficit, and labour market instability).

Figure 4: Foreign exchange rates percentage change across EMs



Source: IMF (2014)

This depreciation has led to imported inflation in the South African economy. Goods and services effectively cost more in rand terms and once imported, the cost is passed through production and eventually onto consumers who will face increases in fuel and food prices. As fuel and food prices increase, production output may decrease due to rising input costs and consumer spending may fall following higher domestic prices. This decrease in production and consumption affects economic growth negatively and impacts harshly on developing countries.

3. *The effects of QE in the EU on South Africa*

Facing a euro zone crisis in 2010, with slowed economic growth, as well as a debt crisis in Greece and Spain, amidst rising concerns of deflation within the Eurozone, the ECB has since engaged in QE as of January 2015. The ECB will buy €60bn of government bonds each month from across the EU. This buy-back will last until at least September 2016. EMs were not entirely surprised by the ECB's decision to engage in QE after historically low short-term nominal interest rates failed to stimulate aggregate economic activity. Therefore, market participants had anticipated the effects more easily than tapering in the US. Following QE in the EU, market spill-overs in South Africa included a moderate depreciation of the euro against the rand. The current account deficit is also expected to widen during QE by the ECB due to a stronger rand relative to the euro and weak aggregate demand from South Africa's largest export partner, the EU, accounting for 33.33% of South African trade.

3.1 The Rand Vs. The Euro

The domestic currency in every economy where QE has been employed (US, UK, Japan) has depreciated in value against the rand. The euro is no exception, decreasing to two year lows of R12.71/euro in April this year, after the ECB's announcement in January 2015 to begin their LSAP programme. Subsequently, leading up to the January QE announcement,

the euro was trending upwards against the rand (appreciating) maintaining in the R14/euro level.

Figure 5: Euro/Rand exchange rate

Source: www.exchangerates.org.uk

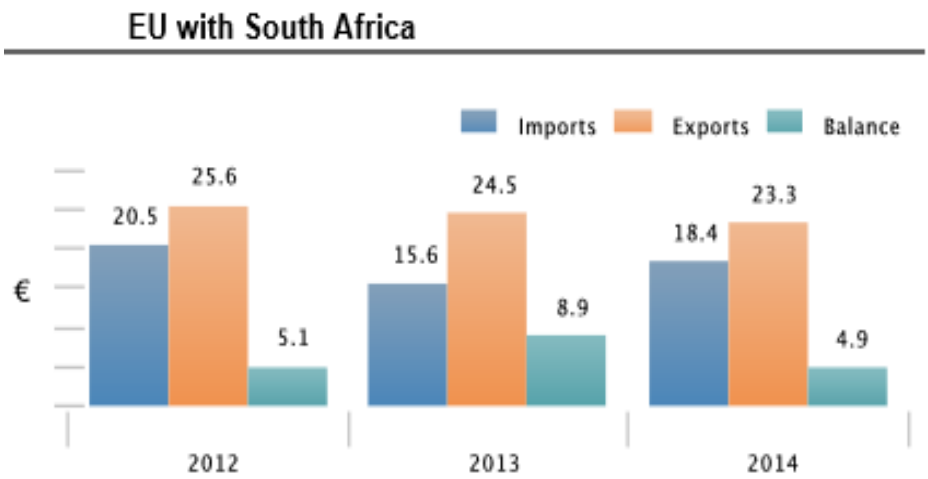
Figure 6 shows that the euro has steadily weakened against the rand during 2015 following the ECB's decision to begin QE. As the rand gains ground on the euro, imported goods to South Africa will become effectively cheaper and exports more expensive to the EU eroding export competitiveness and ultimately revenue in exporting industries.

3.2 Trade with the EU

It is widely accepted to have a favourable trade balance by having a larger amount of exports relative to imports. An inflow of foreign currency increases a country's foreign reserves which are used to finance the purchase of imports. South Africa must target higher export growth than import growth to sustain a positive inflow of foreign currency.

With the euro now depreciating against the rand after QE announcements, the EU should effectively import less from South Africa. Demand for South African exports will diminish as the euro loses value to the rand. Exporting industries, such as mining, agriculture and manufacturing will incur revenue and potential job losses over the medium-term. This is good news for exporting industries in the EU, resulting in increased demand from South Africa for "cheaper" exports. However, South Africa will face increased competition from newly-devalued euro exports adding to domestic woes. Imports are likely to increase adding to the current account deficit and curtailing foreign reserves. As the euro weakens further, imported inflation in the EU could put a squeeze on consumer spending reducing demand for South African exports further. Figure 6 shows overall trade of the EU with South Africa from 2012-2014 measured in euro billions.

Figure 6: EU balance of trade with South Africa



Source: www.trade.ec.europa.eu

The EU is South Africa's most important bilateral trade partner, accounting for a third of South Africa's total trade with the world. The EU also represents one of the most significant export markets for South Africa's value-added manufactured goods, especially those derived from labour-absorbing industries. This further highlights the need to boost export competitiveness in labour absorbing industries to absorb QE shocks from the EU that will hamper South African exports.

4. *Quantitative analysis*

Following the above analysis and knowing QE normalisation and expansion is targeted at manipulating long-term interest rates in the US and EU, in order to simplify the impact on economic growth, 10y South Africa government bond yields are used as a proxy for long-run economic growth. A study by Ang et al. (2006) and Bordo and Haubrich (2008) all found 10y bond yields, represented in the yield curve, have significant predictive power in determining future economic activity. Lower long-term bond yields are associated with increased levels of investment spending and consumption whilst higher long-term bond yields with declining levels of investment spending and consumption.

A study by Lim et al. (2014) estimates a vector autoregressive model (VAR) to observe the impact and shocks of unconventional monetary policy normalising in the US. I follow this methodology by estimating a VAR model to observe the impact from impulse responses of QE normalisation and expansion in the US and EU on South African long-term bond yields.

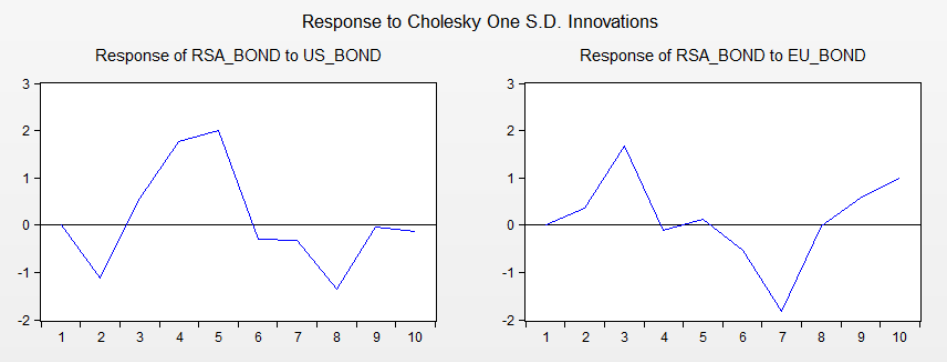
All data is available from EasyData (Quantec) and was converted to logarithmic values to obtain the quarterly returns of each variable. All variables were differed once in order to satisfy stationarity requirements of a VAR. The sample size was from 1997-Q1 to 2015-Q1. Due to the availability of data, quarterly values were chosen and needed to capture the effects of tapering in the US.

I estimate a vector autoregressive (VAR) model in Eviews with p (= 7) lags (quarters) and N (=7) variables to capture both tapering effects in the US as well as QE expansion of the EU. There will be a system of 7 estimated equations with X_t assuming the value of each variable in each equation estimated.

$$X_t = c_1 + \alpha_1 X_{t-1} + \alpha_2 X_{t-2} + ...\alpha_p X_{t-p} + \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + ...\beta_p Y_{t-p} + e_t$$

Estimated variables are:
SA 10y government bond yields; US 10y government bond yields; 10y EU Government bond yields; ZAR/EUR; ZAR/USD; JSE ALSI. Trade with the EU could not be measured as trade statistics for 2015/Q1 were not available at the time.

Figure 7: Impulse responses from VAR (7) responses to Cholesky One SD innovations



The extracted impulse responses were deemed most relevant when analysing the proxy for economic growth in South Africa. These impulse responses show the effect of a one standard deviation shock of US and EU bond yields on South African bond yields over a 10 quarter period.

South African 10y government bonds react negatively to a shock on US 10y government bonds for a time period of 1.5 periods and then positively thereafter for a period of 3 periods and only returning to an equilibrium position after 8 periods.

South African 10y governments bond reacts positively to a shock on EU 10y government bonds for a time period of 2.5 periods and then negatively for 1 period then returns back to equilibrium for two periods

US 10y government bond yields (lag 7-quarters) showed a positive relationship on SA 10y government bond yields implying an increase in US 10y government bond yields would increase SA 10y government bonds during tapering by the Fed.

The ZAR/USD (lag 6-quarters) showed a positive relationship on SA 10y government bond yields implying an increase (depreciation) in ZAR/USD would increase SA 10y government bond yields during tapering by the Fed.

EU 10y government bond yields (lag 1-quarter) showed a positive relationship on SA 10y government bond yields implying an increase in EU 10y government bond yields would increase SA 10y government bond yields during QE expansion by the ECB.

The ZAR/EURO (lag 1-quarter) showed a positive relationship on SA 10y government bond yields implying an increase (depreciation) in ZAR/USD would increase SA 10y government bond yields during QE expansion by the ECB.

These results suggest that long-term bond yields in South Africa are negatively impacted by US normalisation (tapering) whilst QE expansion in the EU exerts a positive impact on long-term South African bond yields.

Since QE normalisation and expansion is targeted at manipulating long-term interest rates in the US and EU which impact on South African long-term interest rates, I conclude that both the US and EU 10y government bond yields have an impact on economic growth in South Africa. The US has a greater implied impact on South Africa than the EU. South Africa is more vulnerable to the normalisation of monetary policy in the USA than expansion of QE in the EU leading to the need of policy makers to address the impact on economic growth in South Africa.

5. *Recommendations for policy makers*

Knowing South Africa's integration in world financial markets and the capital inflows received throughout QE, South Africa's vulnerability arises from pertinent characteristics of its economy, in particular: a strong dependency on foreign capital flows; an easy accessible equity and debt market; a shortage of foreign currency reserves and a large current account deficit. Table 1 show's policy actions South Africa has taken during periods of QE normalisation and expansion compared to other members of the BRICS group.

Table 1: Policy actions of select BRICS countries during QE normalisation (the Fed) and QE expansion (ECB)

	Monetary policy		Fiscal policy	Macro-prudential Policy	FX Intervention	Liquidity provision measures
	Tight	Loose	Tight	Tight		
Brazil	✓		✓		✓	✓
India	✓		✓	✓	✓	✓
Russia	✓				✓	
South Africa	✓		✓			

Source: IMF Staff discussion Note (2014)

Considering the above actions taken, in order for South Africa to bolster unwanted shocks of these two different QE programmes, I suggest the following policy recommendations that can be used in response to QE-driven boosts and tapering-induced declines.

- A time-varying reserve requirement for commercial banks which can be used as a means to control capital flows with prudential purposes, especially for emerging economies like South Africa.

- Sufficient and liquid foreign currency reserves can provide buffers against unanticipated currency shocks due to QE normalisation or expansion and at the same time diversify reserve currencies thereby reducing exposure to the dollar and euro.
- The SARB should strengthen their policy coordination with the Fed and ECB to prevent unintended and unfavourable spill overs from these developed economies. Policy coordination can lead to aligned economic objectives between developed and emerging economies as well as understanding of desired objectives of unconventional monetary policies.

In addition to the above recommendations, policy makers in South Africa should also consider the following policy actions following prospects of weakening economic growth. Reforming the domestic economy to build resilience to external shocks cannot be stressed enough. The following recommendations are made to aid weak macroeconomic fundamentals constraining economic growth in South Africa over the long-run.

- Reduce the current account deficit by targeting increased regional export growth in Sub-Saharan Africa and the rest of Africa and ensure stability within exporting sectors such as agriculture and mining.
- Secure a sustainable supply of electricity by diversifying the sourcing of energy to alternative methods of energy production such as solar, wind and nuclear energy as well as privatising the supply chain of Eskom.
- Reduce wasteful and unnecessary expenditure in government departments to aid in reducing the budget deficit.
- Improving education and addressing skills shortages by developing an updated model to forecast demand and supply of scarce skills focusing on job-related and trade skills; review and evaluate the standards of selected South African education institutions covering scarce skills in priority sectors; offer a matching-subsidy to incentivise firms to meet their skills needs.
- Increasing labour market flexibility by simplifying dismissal procedures on substantiated grounds of productivity or gross misconduct; conduct an inspective review of the conciliation-arbitration process to improve participation rates and evaluate the cost-benefit of this process on businesses.

6. *Conclusion*

This essay set out to establish the pertinent effects of tapering in the USA and the more recent effects of QE in the EU on South Africa. Several spill-overs were recognised: a change in capital flows, exchange rates, equity prices and trade balances. These spill-overs highlight the need of specific policies to adequately address the unwanted effects of QE normalisation and expansion. It is of high importance that policy makers in South Africa implement policy action to reduce and bolster unwanted spill-overs especially if South Africa wishes to achieve an average annual economic growth of 5.4%. In reducing spill-over effects I recommend a time varying reserve requirement for commercial banks to manage capital flows. I also recommend a sufficient amount of foreign currency reserves which can be used to intervene in FX markets to off-set unwanted appreciation/depreciation of the rand. Strengthening policy coordination between the SARB, the fed and the ECB also provides clarity on policy objectives and outcomes further reducing spill-overs. With economic growth

in South Africa partially reliant on the US and EU, recommendations on weak macroeconomic fundamentals are made to build further resilience to external shocks and to promote economic growth and employment in the long-run

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