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Effects of Fiscal and Monetary Policy Uncertainty on Economic Activity in South Africa*

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Abstract

The paper examines the effect of fiscal and monetary policies on economic activities in South Africa while attempting to identify the role of uncertainty. The paper uses quarterly time series data using the variables of income tax, consumption tax, capital tax, and government expenditure to measure fiscal policy uncertainty while interest and inflation rate variables were used to measure monetary policy uncertainty. Also, real gross domestic product, real consumption, real investment, and employment were used to measure economic activities. The partial least squares structural equation model (PLS-SEM) was used for analysis and result presented for measurement and structural models. Results revealed the existence of policy uncertainty in the South African economy which tends to reduce the level of economic activity as uncertainty increases. This result informs of the need for policy makers to minimally reduce uncertainties for both fiscal and monetary policies for the economy to improve.

Keywords: Policy uncertainty, fiscal policy, monetary policy, economic activity, PLS-SEM.

JEL: C32, E32, E52, H32, O47.

1. Introduction

South Africa was not spared from the impact of the 2008 Global Financial Crisis (GFC) which left majority of nations such as United Kingdom, United States, and Nigeria in a financial and economically unstable shape. Due to the short recession in 2009, South Africa's budget deficit made a downturn, hitting a record high of -4.8% in 2013 (Department of Information and Research (DIR) Report, 2017). Furthermore, the global economy is increasingly becoming more complex by the day, requiring nations to make tough political choices that would ensure fiscal sustainability while taking government debt into account.

More recently, the crisis in South Africa that was targeted at businesses of non-South African indigenes pose a major threat to investments in the country, raising tensions and another form of uncertainty leading to loss of lives, loss of investments, loss in number of man days, reduced output, reduced employment, increased government expenditure with less revenue amongst several other effects. This has a negatively skewed effect on South Africa's economy.

Sequel to these, South Africa has continued to focus on its fiscal and monetary policies which tend to determine the macroeconomic direction of the country as a viable strategy in regaining economic stability and consequently economic growth. Monetary policy is mainly concerned with maintenance of adequate foreign exchange reserves and price stability while fiscal policy simply involves decisions about government spending and revenue. Also, it has been the major policy instrument for macroeconomic management in South Africa.

Even though policy formulation is made based on assumptions, the real world is purely based on reality. The functionality and effectiveness of these policies have continued to be affected by some uncertainties in the Country's economy. These uncertainties are fundamentally routed through political, social, economic, and cultural divides which further widens the gap between forecasted changes and actual changes in macroeconomic variables upon which decisions are made. In the words of Ferreira (2018) policy uncertainty is heavily responsible for contraction of the economy and poses further risk of contraction.

As for Heysstek (2017) political and policy uncertainty weaken the exchange rate and drive away potential investors which negatively affects business start-ups and expansion of already existing ones, few jobs are created, and the people are more impoverished. If the fiscal path is made a little clearer, the reduction in uncertainty should spur investment and output, which in turn should improve the fiscal picture (Aye, 2019). An economy that is uncertain is highly unpredictable and certainly not a good investment attraction destination for potential investors who will pend until the polity is clear. There is thus the need to always minimize uncertainties in every economy.

Policy decisions are often taken in the absence of perfect knowledge or information. However, the presence of uncertainty could affect the operating strategies and institutional structures that shape monetary and fiscal policies. Therefore, accounting for such uncertainty should contribute to the quality of policy decisions.

The purpose of this research is to examine how policy uncertainty may affect the effectiveness of fiscal and monetary policies on real economic variables in South Africa. The Partial Least Squares Structural Equation Modelling (PLS-SEM) approach is proposed for the empirical analysis as this allows multiple channels of cause-effect relationships in exploring complex relationships hidden in a data. Moreover, the PLS-SEM permits both direct and indirect linkages among fiscal policy, monetary policy, and economic activities.

2. Literature Review

Theoretically, higher uncertainty affects economic activity through irreversible investments, marginal revenues and precautionary savings. Rising uncertainty causes firms to wait before investing and hiring, and causes consumers to wait before purchasing certain consumption goods (Bernanke 1983; Pindyck, 1991). In other words, uncertainty could delay both investment and consumption plans as there is a real option effect to waiting (Aye et al., 2019).

These consequently could slow down economic growth (Bloom, 2009; 2014). Another theoretical view of uncertainty is that high uncertainty increases the borrowing costs for firms (Christiano *et al.,* 2014). More specifically, capital taxes, consumption taxes, and labour income constitute

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Government sources of revenue which tend to be unpredictable during periods of fiscal policy uncertainty. During such periods, Government proposed expenditures in terms of budgetary allocations are equally negatively affected. These create harsh operating environment for businesses to thrive leading to collapse of infant industries that may be unable to withstand the shocks or uncertainties within the economy. The circular flow of money is directly related to Government expenditure.

There exists empirical evidence from studies reviewed that both fiscal and monetary policy uncertain exist in South Africa exerting different kinds of effect in terms of magnitude and direction. Despite the fact that uncertainty is measured using different parameters or approaches, its effect is always registered in South Africa's economy.

Similar work includes those of Aye et al. (2019), who examined the effectiveness of monetary and fiscal policy shocks on US Inequality, the role of uncertainty and found that both contractionary monetary and fiscal policies increase inequality, and in the presence of relatively higher levels of uncertainty, the effectiveness of both policies is weakened.

Stan et al., (2007) studied the cyclicality of monetary and fiscal policy in South Africa since 1994 and submitted that there is a growing consensus that monetary policy has contributed to the remarkable stabilization of South African economy over the period. Also, the evaluation of the role of fiscal policy in stabilization has been less favourable and there is little evidence that a countercyclical fiscal stance was a priority over this period.

With the use of a structural model in contrast with the reduced form models typically used in the South African literature, incorporates the dynamic interaction between monetary and fiscal shocks on the demand side and supply shocks on the other, and avoids controversy over 'neutral' base year and the size of fiscal elasticities. Furthermore, the model confirms the consensus on monetary policy, finding it to have largely countercyclical since 1994.

Furthermore, Aye et al. (2019) examined the asymmetric effect of fiscal policy uncertainty on real economic activity in South Africa; Kotze (2017) considered the effect of fiscal volatility shocks

on key macroeconomic variable; Jayaraman (1993) evaluated the impact of fiscal and monetary policies adopted by the governments in the SPICs on economic growth. However, there is little or no known research that examined the role policy uncertainty plays in the effectiveness of fiscal and monetary policy on economic activities in South Africa.

Aye et al. (2019) examined the asymmetric effect of fiscal policy uncertainty on real economic activity in South Africa using times series data spanning from 1990 (Q1) to 2018 (Q2). Fiscal policy uncertainty is defined using the variables of capital tax, consumption tax, labour income tax and government spending. The results based on linear projection models that follow for asymmetry show that in general, high fiscal policy uncertainty exhibits a negative effect on real GDP while low fiscal uncertainty exhibits a positive effect on real GDP. High volatility (bad news) has larger effect in general than low volatility (good news). Therefore, concluding that fiscal policy uncertainty has asymmetric effect on real economic activity in South Africa.

Kotze (2017) considered the effect of fiscal volatility shocks on key macroeconomic variable. Using a stochastic volatility model that is applied to policy rules for each fiscal instrument, thereafter a vector autoregressive model makes use of these measures in a reduced-form setting to consider the effect of an aggregate fiscal volatility shock on economic output, consumption, investment, prices and interest rates. The final part of the analysis involves the construction of a dynamic stochastic general equilibrium model that may be used to investigate the effects of an unexpected increase in volatility of each fiscal instrument.

The results suggest that fiscal volatility shocks produce prolonged contractions in economic output, consumption and investment. In addition, the labour market is also negatively affected while gross markups and inflation increase. Hence, it is suggested that fiscal volatility shocks have had an important adverse effect on economic activity in South Africa.

Jayaraman (1993) evaluated the impact of fiscal and monetary policies adopted by the governments in the SPICs on economic growth. The reduced form of St. Louis equation was modified to reflect the openness of the four SPICs by including their export performance as well as their proneness to periodical cyclones. The results of empirical analyses show that fiscal policies

have not been effective in any of the four countries for promoting economic growth. Hence the results are comparable. The conclusion is fiscal policies have been found to be less effective.

On the empirical front, a large number of studies have examined the effect of economic policy on macroeconomic variables in the presence of uncertainty and documented that effect of policy on macroeconomic variables is not the same under uncertainty.

3. Data and Empirical Model

The variables used in the paper are income tax (INCTAX), consumption tax (CONSTAX), capital tax (CAPTAX), Government expenditure (GOVEXP), Interest (INT), Inflation (INF), real gross domestic product (RGDP), real consumption (RCONS), real Investment (RINV), and employment (EMPL). Quarterly time series data covering from 1990 (Q1) to 2019 (Q2) are used. The sample period is based on data availability. All data were sourced from the South African Reserve Bank (SARB).

The government taxes were available on monthly basis and hence were converted to seasonally adjusted quarterly series with seasonal adjustment done using Census X-13. Capital taxes were computed as the sum of company and property taxes as a percentage of gross fixed capital formation. Labour income taxes were calculated as the percentage of income tax to compensation of residents. Consumption taxes were computed as the percentage of domestic taxes on goods and services to final household consumption expenditure. Government spending was computed as the percentage of consumption expenditure to GDP. All variables were used in their growth rates.

Estimated correlation coefficients are used to describe the relationship existing between variables. In order to interpret the correlation coefficient result, the paper adopted the guidelines are provided by Cohen (1988) which stipulates that for coefficient values in the range of $0.1 < |r| < 0.3$ represents a small correlation. For values within the range $0.3 < |r| < .5$ represents medium/moderate correlation and when $|r| > 0.5$ it signifies a large/strong correlation. where $|r|$ means the absolute value or r (for example, $|r| > .5$ means $r > .5$ and $r < -.5$). Also, descriptive statistics used include mean, median, standard deviation, excess kurtosis, and skewness.

The model employed for determining the effect of fiscal and monetary policies on economic activities in South Africa is the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach. This approach simultaneously considers relationships among multiple independent and dependent constructs. It expresses these complicated variable relationships in a causal model with hierarchical or non-hierarchical, recursive or non-recursive structural equations (Bullock, Harlow and Mulaik, 1994; Hanushek and Jackson, 1977).

Due to advantages such as ability to accommodate data-analysis challenges e.g small sample sizes, non-normal data and models with formative constructs as posited by Hair, Ringle and Sarstedt (2011); Sosik, Kahai, and Piovoso (2009), this paper takes advantage of the several advantages of the PLS-SEM over other methods for analysis. Bodof and Ho (2016) estimated PLS-SEM in two stages, the first stage estimates the measurement model and the second stage estimates the structural model. He further presented the generalized estimation models for measurement and structural models. Similar procedure will be adopted for this paper. At the moment, it suffices to present the empirical pathway analysis of the PLS-SEM, as shown in Figure 1.

4. Empirical Results

This section contains results of analysis detailing descriptive characteristics of variables used for the analysis. Also, the correlation result reported provides information on the nature and strength of relationship existing between the various variables irrespective of the latent variable attached to. Furthermore, the partial least squares structural equation model (PLS-SEM) results are presented in two broad ways namely measurement model and structural equation model or pathway. The results of relationship existing between latent variables, independent-latent variables, and latent-independent variables are presented and interpreted.

Figure 1

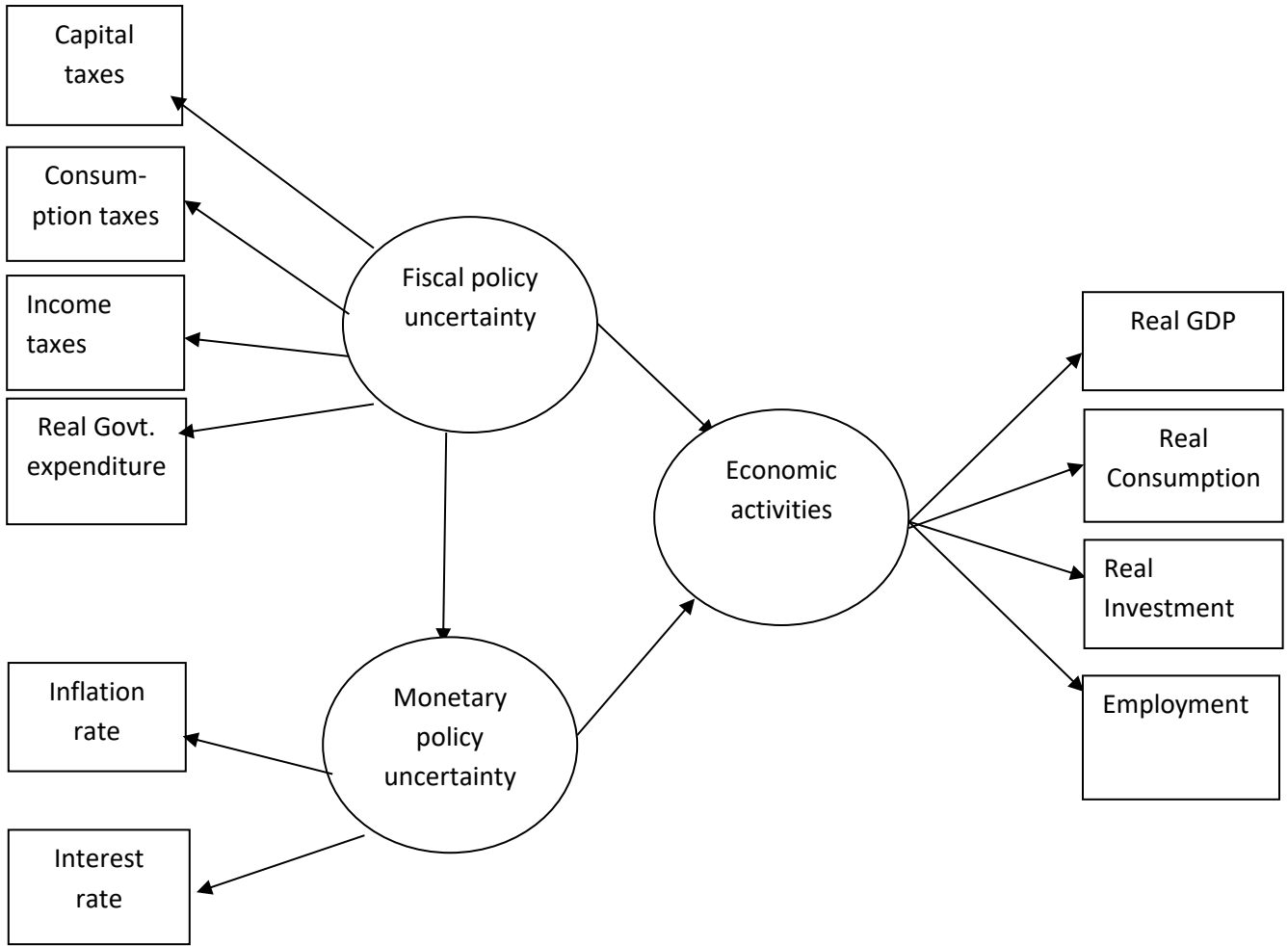**Pathway Analysis of Partial Least Squares Structural Equation Model (PLS-SEM)**

Table 1contains results of descriptive statistics of the independent variables which indicates that the average income tax growth rate in South Africa is 2.3%, while consumption tax growth rate has a mean value of approximately 1.2%. Also, capital tax is pegged at an average of approximately 0.4%, and government expenditure has a mean growth rate of 19.4%. As for monetary policy variables, the average interest rate is 9.9% while inflation rate stands at an average of 6.9%.

The findings also revealed that concerning indicators for economic activities, the country has an average real GDP growth rate of approximately 0.6%, real consumption growth rate remains at 0.7%, with real investment being at 0.8% and employment growth rate is 0.1%. Results on skewness indicates that CONSTAX, RGDP, RINV and EMPL are skewed to the left while the rest are skewed to the right. Also the variables have kurtosis values in excess of 3 for the normal distribution. Applying the formal normality test using Jarque-Bera indicates that only the fiscal policy variables and real consumption are normally distributed.

Table 2 contains results of the correlation existing between fiscal policy, monetary policy, and economic activity variables used for the analysis. Correlation results indicate the existence of different levels of strength and nature of relationships between the variables. Among the fiscal policy variables, income tax shows a moderate linear positive relationship with consumption tax (0.497) and capital tax (0.527). However, income tax shows a strong negative relationship with interest rate (-0.551). Also, consumption tax shows a strong positive relationship with government expenditure (0.527), and strong negative relationship is established with interest rate (-0.597).

Regarding capital tax, a strong negative relationship is established with interest rate (-0.544) while a positive relationship is observed with real GDP (0.445). Conversely, the monetary policy variable of interest rate shares a strong positive relationship with inflation (0.552). Lastly, the results reveal that economic activities variable of real GDP has a strong positive relationship with real consumption (0.643) and real investment (0.553). Similarly, real consumption shows a moderate positive relationship with real investment (0.471) and a weak positive relationship with employment rate (0.387).

Table 1

Descriptive Statistics

	Mean	Median	Standard Deviation	Excess Kurtosis	Skewness	Jarque-Bera P-value
INCTAX	2.311	2.366	0.26	-0.471	0.109	0.483
CONSTAX	1.165	1.161	0.093	-0.138	-0.079	0.869
CAPTAX	0.392	0.394	0.141	-0.28	0.143	0.642
GOVEXP	19.444	19.235	1	-0.906	0.173	0.096
INT	9.911	9.335	3.765	-0.603	0.648	0.007
INF	6.943	6.1	4.104	0.374	0.768	0.003
RGDP	0.568	0.649	0.67	0.166	-0.537	0.063
RCONS	0.719	0.792	0.767	0.216	0.009	0.942
RINV	0.827	1.199	2.264	1.054	-0.778	0.003
EMPL	0.144	0.112	0.651	2.122	-0.593	0.000

Table 2

Result of Correlation Indicating Relationship Between Variables

	INCTAX	CONSTAX	CAPTAX	GOVEXP	INT	INF	RGDP	RCONS	RINV	EMPL
INCTAX	1.000									
CONSTAX	0.497	1.000								
CAPTAX	0.527	0.236	1.000							
GOVEXP	0.193	0.527	-0.074	1.000						
INT	-0.551	-0.597	-0.544	-0.546	1.000					
INF	-0.211	-0.282	-0.423	-0.244	0.552	1.000				
RGDP	0.018	0.074	0.445	-0.199	-0.213	-0.229	1.000			
RCONS	-0.106	0.092	0.388	-0.206	-0.202	-0.277	0.643	1.000		
RINV	0.050	0.078	0.339	-0.197	-0.128	-0.038	0.553	0.471	1.000	
EMPL	0.062	0.228	0.297	-0.051	-0.229	-0.034	0.365	0.387	0.303	1.000

The measurement model results of partial least square is presented in Table 3 while structural equation model results are presented in Table 4. Furthermore, Figure 2 presents the structural pathway of interaction among the variables. Results in Table 3 reveal that in the presence of fiscal policy uncertainty, government income sources through the tax regime responds in a positive direction as reported for capital tax, consumption tax, income tax as well as government expenditure. As fiscal policy uncertainty levels increase by one unit, capital tax increases by 0.705. Similarly, consumption tax rises by 0.589 while income tax increases by 0.482.

In a similar way, government expenditure responds positively to the tune of 0.433. This implies that an economy with high levels of fiscal policy uncertainty is characterized with high tax regime which tend to discourage start-ups, expansion of existing businesses, reduced profit margins and making the business environment unfavourable, thereby, reducing the level of economic activity. Kotze (2017) earlier submitted similar findings that increasing uncertainty to taxes on capital leads to a decline in economic activity in South Africa as measured using output consumption and investment.

Similarly, working hours and real wage decline over an extended period of time. In a similar view, Villaverde et al. (2011) posits that uncertainty has an important effect on measures of economic activity in other emerging market economies.

Based on result in Table 3, monetary policy uncertainty has been analyzed using independent variables of interest rate and inflation rate. Results indicate that when uncertainty in the monetary policy increases, inflation rate increases by 0.563 while interest rate increases by 0.979. This agrees with Christiano et al. (2014) that high uncertainty increases the borrowing costs for firms. The Table further reveals that fiscal policy uncertainty and monetary policy have an inverse relationship which implies that increased uncertainties in fiscal policy leads to a decrease in the level of uncertainty in the monetary policy uncertainty.

This result drives home the importance of striving for equilibrium in uncertainty levels for fiscal and monetary policies of the economy of South Africa. This finding is in line with the position of Otmar (2005) who posits that a stable and predictable economic environment contributes

substantially to social and economic welfare. In the short-run, households prefer to have economic stability with continuous employment and stable incomes, allowing them to maintain stable consumption over time and in the long-run, unnecessary economic fluctuations can reduce growth, for example by increasing the riskiness of investments.

Regarding economic activity variables, results indicate a positive and statistically significant effect on economic activities in South Africa, as an increase in economic activities by 1% will lead to an increase in employment rate by 0.609, while real consumption will increase by 0.830. Furthermore, real GDP will be raised by 0.810 following a unit increase in economic activities level and real investment will increase by 0.369 if economic activities increase by one percent.

The result in Table 4 presents the structural model which measures the latent to latent variables relationship. In this case, it measures the relationship between fiscal policy and monetary policy uncertainties as well as economic activities. Results indicate that fiscal policy uncertainty exerts a negative and statistically significant effect on monetary policy uncertainties. This implies that as uncertainty levels relating to fiscal policy rises by 1 unit, the uncertainty levels for monetary policy decreases by 0.986. Also, decreasing fiscal policy uncertainties by one unit leads to an increase in economic activities in South Africa.

Similarly, a decrease in monetary policy uncertainties lead to an increase in the economic activities by 1.379 times. Furthermore, increasing the levels of uncertainty in fiscal policies reduces the level of economic activity by 1.069 while rising levels of uncertainty relating to monetary policy instruments contribute by 1.379 in reducing the level of economic activity in South Africa.

This finding is consistent with the submission by Kotze (2017) who reported that a positive fiscal volatility shock gives rise to an initial decrease in economic activity. He further reported that an increase in the probability of a rise in the taxes on capital, households would choose to reduce their investment. In addition, the output contraction would give rise to a reduction in production as a result of a decline in demand.

Table 3

Partial Least Squares Measurement Model for Independent Variables

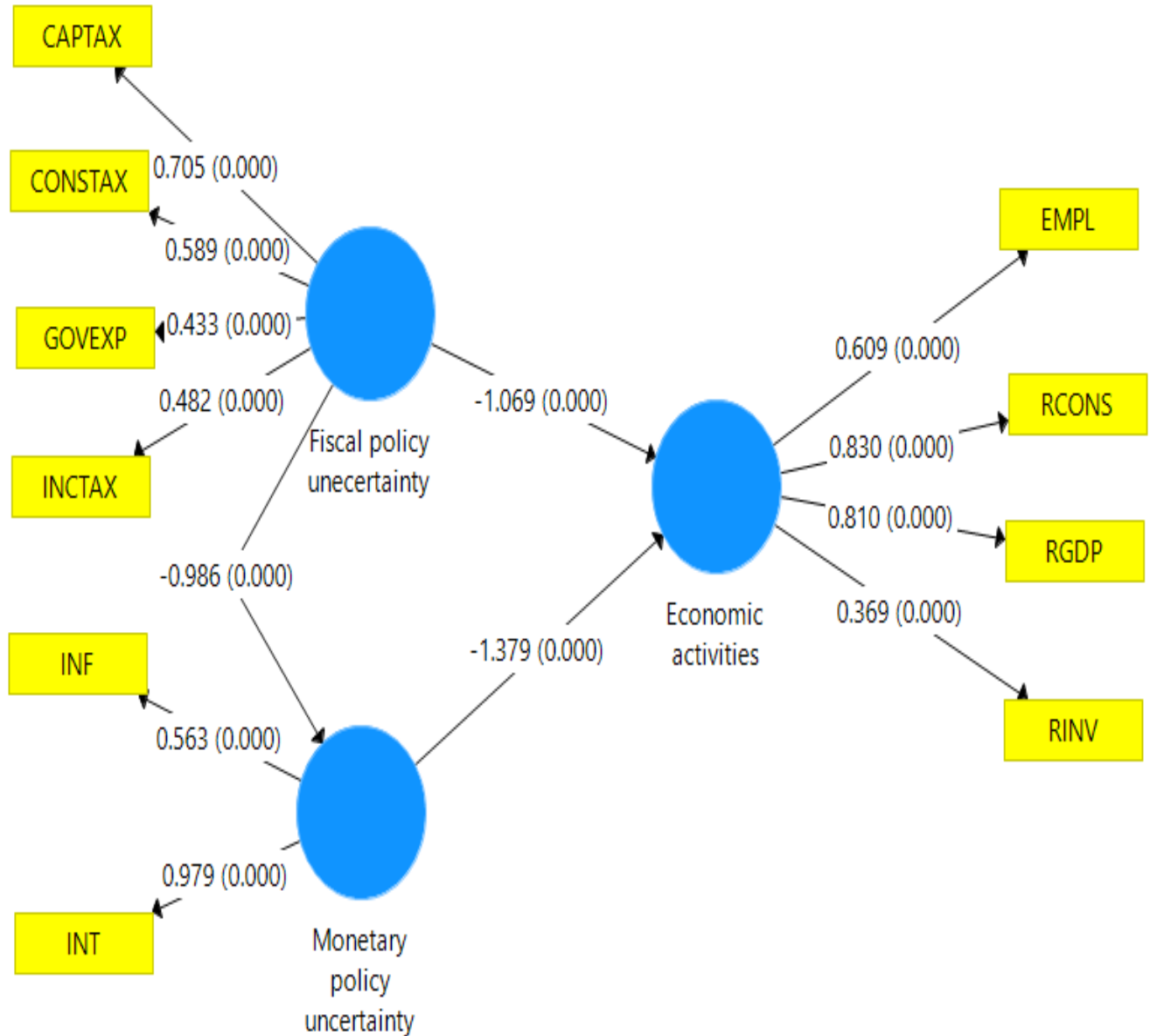|	Fiscal Policy Uncertainty	Monetary Policy Uncertainty	Economic Activity
CAPTAX	0.705		
CONSTAX	0.589		
GOVEXP	0.433		
INCTAX	1.000	0.482	
INF		0.563	
INT		0.979	
EMPL			0.609
RCONS			0.830
RGDP			0.810
RINV			0.369

Table 4

Partial Least Squares Structural Equation Model

	Fiscal Policy Uncertainty	Monetary Policy Uncertainty	Economic Activity
Fiscal Policy Uncertainty	-	-0.986	-1.069
Monetary Policy Uncertainty	-0.986	-	-1.379
Economic Activity	-1.069	-1.379	-

Figure 2

Pathway Analysis of Partial Least Square Structural Equation Model (PLS-SEM) for the Effect of Fiscal and Monetary Policy Uncertainties on Economic Activities

5. Conclusion

The paper examined the effect of monetary and fiscal policies on economic activities in South Africa, with the aim of identifying the role played by policy uncertainties in the effect recorded. To achieve this, the research used secondary data obtained from the Reserve Bank of South Africa on a quarterly basis.

The empirical findings reveal that policy uncertainties exist in the South African economy, and these uncertainties exist in both fiscal and monetary policies. This tends to increase capital tax, consumption tax, government expenditure, income tax, inflation rate and interest rate. Consequently, this makes it difficult to conduct business at all levels, thereby reducing economic activity in the South African economy.

This result points to the fact that there is every need to reduce policy uncertainty to a bare minimum for the economy to thrive. This can be achieved by maintaining a low and stable tax regime, which will encourage investment, trigger competition, and eventually reduce the final prices of goods and services, as well as increase consumer disposable income and purchasing power. Similarly, interest and inflation rates should be kept at a low and stable position in order to reduce monetary policy uncertainty in South Africa.

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