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The Effect of Government Expenditure on Sectoral Performance In Malawi

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Abstract
The relationship between government expenditure and economic growth has always been debated among scholars. While the Keynesian school of thought postulates a positive causal relationship, the Neo-classical school argues that the relationship is negative. A rather neutral view is associated with the Ricardian school, which postulates that the relationship is non-existent. Recently, the Malawi Government launched its long-term development plan for the country, the Malawi 2063. As has been the tradition with all the other policies that Malawi has been implementing, the agriculture, education, and health sectors have been highly prioritized in terms of public resource allocations. However, the performance response of these sectors to the increased government expenditure has not been established. Using data from 2002 to 2020, we employed the Fully Modified Ordinary Least Squares (FMOLS) technique to estimate this effect. We find a significantly positive relationship between government expenditure and the growth rates of the three sectors. Holding all other factors constant, a K1 billion increase in the Government's total expenditure to each of the three sectors heads to a 0.24 percentage point increase in sectoral growth. Moreover, this effect is markedly higher for development expenditure (0.34 percentage points) than for recurrent expenditure (O.26 percentage points). The results point to the need for the government to continue allocating more resources to the three sectors, especially for capital investment rather than consumption expenditure. There is also a need to control inflation and encourage measures that curb corruption as the two retard the growth of the three sectors.
Keywords: Government expenditure, sectoral performance, fully modified OLS
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1.0. Introduction

The Malawi government has been pursuing growth and development through the implementation of various development plans and strategies, notably the Statement of Development Policies (DEVPOL), the Vision 2020, the Malawi Poverty Reduction Strategy Paper (MPRSP), and the three Malawi Growth and Development Strategies (MGDS I, II, and II). These and many other sectoral policies are viewed as a country-level reflection of international and regional aspirations and goals to which Malawi subscribes, including the United Nations (UN) Sustainable Development Goals (SDGs) (UN, 2015), and the African Union's (AU) Agenda 2063 (AU, 2015). In the course of implementing these strategies and policies, the government has been allocating significant resources towards various sectors including agriculture, education, and health through the national budget (see, e.g., GoM, 2022; 2021; 2020). Through such resource allocations, the government envisions successful implementation of various interventions in the sectors, as well as the attainment of its overall economic growth targets. Since 2000, the Government has consistently set its growth target at around 6 percent per annum ((GoM, 2021), (GoM, 1998)). In its recent projections, the National Planning Commission (NPC) reaffirms that Malawi needs a consistent annual economic growth rate of around 6 percent in order to attain its targeted middle-income status by 2030 (GoM, 2021). However, real government expenditure (computed by deflating nominal expenditure by the consumer price index) has seen an upward trend over time while economic growth has remained erratic, and persistently below the required 6 percent since 2012 (Figure 1).

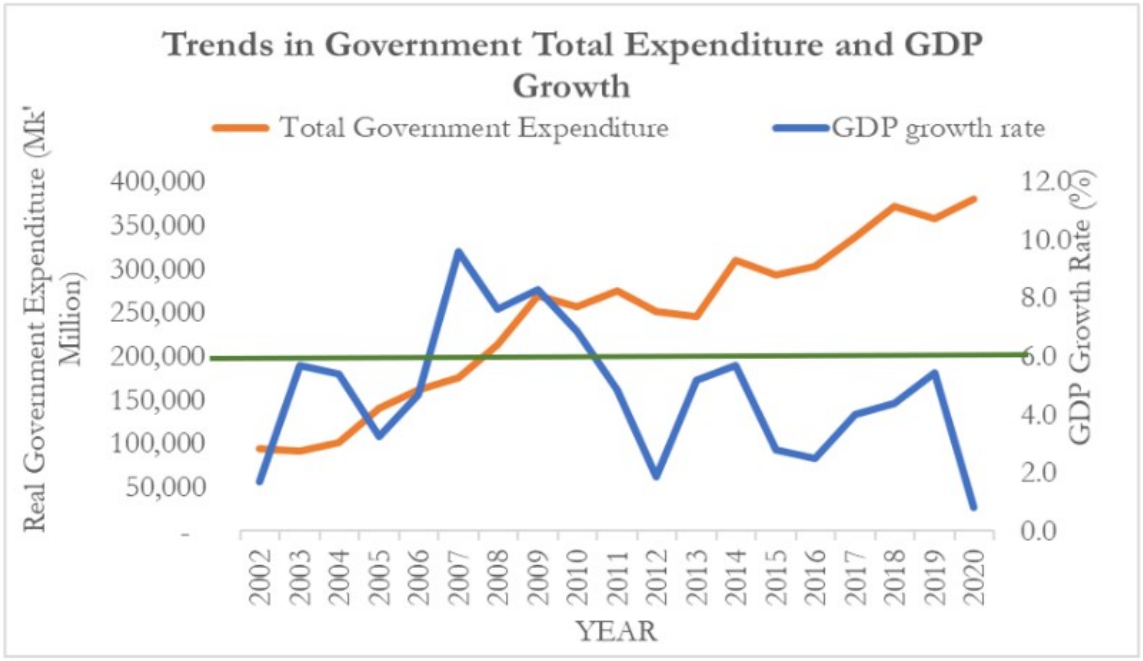

Figure 1: GDP growth vs. Total government budget

The relationship between government expenditure and economic growth has been debated among scholars over time. Three major competing theories explain this relationship: Keynesianism stipulates a positive relationship (Mitchell, 2005); Neo-classicism argues that the relationship is negative; and the Ricardian school suggests that government expenditure does not affect economic growth (Bernheim, 1987).

Empirical studies that have been conducted in this area in different settings and using different methodologies also find contradicting results. For example, Lahirushan and Gunasekara (2015) find a positive relationship, while Hasnul (2016) find a negative relationship. Moreover, studies that have disaggregated the expenditures by category (whether development or recurrent) or by type (expenditure by which sector) find equally contradicting results (see, e.g., Mainali, 2012; Amusa and Oyinlola, 2019; Al-Fawwaz, 2015; Attari and Javed, 2013; Egbetunde and Fasanya, 2013; Leshoro, 2017; Chiekezie and Nkamigbo, 2020; Modebe et al., 2012; Bappahyaya et al., 2020; Danladi et al., 2015; Nyarko-Asomani et al., 2019; Wahab, 2011; Dauda, 2009; Aluthge et al., 2021; and Chude and Chude, 2013).

Recently, the Malawi Government launched its long-term development plan for the country, the Malawi 2063. As has been the case with all other policies and strategies, the agriculture, education, and health sectors, among others, have been prioritized for public resource allocation. For example, in the First 10-year Implementation Plan for the Malawi 2063 (dubbed the MIP-1), the Agriculture Productivity and Commercialization pillar has been allocated 34 percent of allocations to all pillars, making it the second most highly endowed after Industrialization among three pillars. Further, the Human Capital Development enabler (which includes health and education) has been allocated some 31 percent of allocations to all enablers, also being second highly endowed after Economic Infrastructure among seven enablers (GoM, 2021). The three sectors have been highly prioritized historically.

This study investigates the effects of the expenditures towards the agriculture, education, and health sectors on their respective growth rates. While it is apparent that expenditure towards these sectors has been increasing in real terms, the performance (growth) of these sectors has been erratic, just like the overall economic growth (Figure 2).

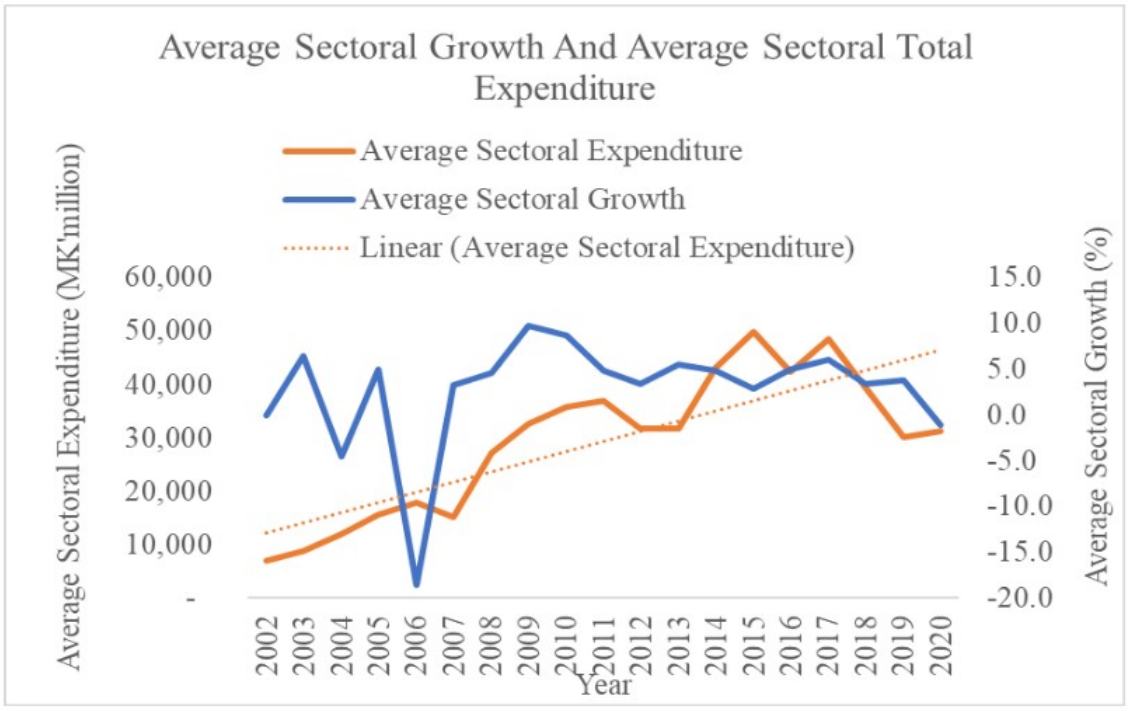

Figure 2: Average sectoral growth rate and average sectoral government expenditure

Most studies on the subject have focused on the general (aggregated or economy-wide) effects of government expenditure on economic growth in different countries. Examples include Kamaliza (2021), Makuyana and Odhiambo (2019), and Musaba et al. (2013) for Malawi, as well as Danladi et al. (2015) and Al-Fawwaz (2015) for other countries. On the other hand, studies that have analyzed sectoral performance in Malawi have each focused on a single sector (e.g., Mwabutwa, 2017; Chirwa, 2018; Jambo, 2017; Matchaya et al., 2014), which leaves a bigger gap for policy formulation since economic growth is an aggregate of the growth of the various sectors in the economy.

In departure, this paper focuses on three key sectors that are contributors to economic growth for which relatively sufficient data are available, namely the agriculture, education, and health sectors. The study further disaggregates the total sectoral expenditures into their recurrent and development components, and the relative effects of the two components on sectoral growth are assessed.

2.0. Methods

2.1. Empirical Analysis

We employ a Fully Modified Ordinary Least Squares (FMOLS) estimation technique. The method is chosen based on its ability to accommodate a small sample size and to consider the dynamic element in the regression (Mark and Sul, 2003). In addition, the method controls for endogeneity which is a common problem in dynamic panel analyses, as noted by Esposito et al. (2019). FMOLS is also applicable where the regressors are a combination of I(1) and I(0) (Phillips, 1993). The model specification by Molonko (2013) is adopted and modified to suit the purpose of this paper. Among others, debt servicing, which is used in the paper by Molonko (2013), is dropped as it is part of recurrent expenditure in Malawi. We control for corruption and inflation which have been found to have an effect on economic growth in several studies, including Mo (2001), Braha and Anoruo(2005), Gillman and Harris(2006), as well as Bruno and Easterly(1998). The estimated model is:

$$SECGRO_{it} = \beta_0 + \beta_1 TOT_{it} + \beta_2 CORR_{it} + \beta_3 INF_{it} + \eta_i + \varepsilon_{it} \quad \text{.....1}$$

Where: $SECGRO_{it}$ is Sectoral Performance (Growth) measured by the GDP growth rate of the sectors; TOT_{it} is Government Total Sectoral Expenditure; $CORR_{it}$ is Corruption; INF_{it} is Inflation; β_0 is the constant term; ε_{it} is the error term; $\beta_i's$ are coefficients and; η_i is the individual sectoral effects term.

To assess the effect of the disaggregated expenditures, the following model is specified:

$$SECGRO_{it} = \beta_0 + \beta_1 REC_{it} + \beta_2 DEV_{it} + \beta_3 CORR_{it} + \beta_4 INF_{it} + \eta_i + \varepsilon_{it} \quad \text{.....2}$$

Where DEV_{it} is sectoral development expenditure and REC_{it} is sectoral recurrent expenditure.

2.2. The Data

We use annual data from 2002 to 2020. The expenditure data is sourced from the Ministry of Finance's budget documents. Sectoral expenditure is estimated by summing up the allocations to each sector's ministry and subvented organizations, as well as the relevant sectoral allocations to local councils. Nominal expenditures in billions of Kwachas are converted into real figures by deflating them using the consumer price index (CPI) using 2010 as the index reference period. Data on sectoral growth rates, which are used to measure the performance of the sectors, is captured as presented in the budget documents. Real sectoral GDP growth rates are calculated at 2010 constant prices. Corruption figures are sourced from Transparency International, while inflation figures are from the National Statistics Office of Malawi. As regards corruption, a lower score, for example, 0, represents high corruption perception and vice versa.

2.3. Tests

Before running the FMOLS, several tests are conducted. A cross-sectional dependence test is conducted to ascertain if the sectors face common unobserved shocks (Das and Gopal, 2018). The test produces four statistics (the Breusch-Pagan LM, Pesaran scaled LM, Bias-corrected scaled LM, and Pesaran CD) under the null of no cross-sectional dependence. Having established the presents of cross-sectional dependence, the second-generation stationarity test proposed by Bai and Ng (2004) is used. This test is selected based on its ability to account for cross-sectional dependence, as well as its suitability for small sample panels (Barbieri, 2006). To establish the existence of a long-run relationship between the dependent and independent variables, the Pedroni (1999) cointegration test is also conducted, also motivated by its ability to account for cross-sectional dependence. This test produces 11 statistics, and the decision to reject or fail to reject the null hypothesis is based on the significance of the majority of the statistics. A Pesaran and Yamagata (2008) heterogeneity test is also conducted to ascertain whether the sectors are unique. The test has much better size properties and is recommended for T>N cases where T is the time period, and N is the number of cross-sections (Breitung, 2015). No endogeneity test is conducted, since, as already mentioned, FMOLS takes care of the issue. The lag length is automatically determined in the regression.

3.0. Estimation results and discussion

3.1. Descriptive Analysis

Table 1 shows descriptive statistics for all the variables of interest in this study. For the period under consideration (2002 to 2020), the growth rates of the three sectors averaged about 3.0 percent. The highest growth rate (18%) was recorded in the education sector in 2003, while the lowest growth rate (-31%) was recorded in the same sector in 2006.

Table 1: Descriptive Statistics

Variable	Overall Statistics			
	Mean	Std. Dev	Min	Max
SECGRO (%)	2.96	8.28	-31	18.37
TOT (MK' billion)	30.59	14.90	5.06	62.87
DEV (MK' billion)	7.71	7.51	1.89	34.53
REC (MK' billion)	22.88	11.97	3.02	55.16
CORR (%)	30.89	3.01	27.00	37
INF (%)	13.80	6.35	7.41	27.28

A total of MK 1.7 trillion was allocated to the three sectors between 2002 and 2020. The average annual expenditure on these three sectors was MK 30 billion. The highest total expenditure was MK 62 billion, and this was observed in the agriculture sector in the year 2015. The lowest expenditure (MK 5.1 billion) was allocated to the same agriculture sector in the year 2003. Disaggregated figures show that MK 1.3 trillion of the MK 1.7 trillion was allocated through recurrent expenditure, while MK 400 billion was allocated through development (capital) expenditure. On average, the sectors were allocated MK 22.9 billion on an annual basis through recurrent expenditure and MK 7.7 billion through development expenditure. The highest recurrent expenditure (MK 55 billion) was allocated to the education sector in the year 2015, and the lowest (MK 3.02 billion) was allocated to the agriculture sector in the year 2003. The highest allocation through development expenditure was to the agriculture sector in the year 2017 at MK 34 billion, and the minimum was MK 1.9 billion allocated to the health sector in the year 2003.

In terms of corruption, Malawi scored an average of 30.9 between 2002 and 2020. The highest score was recorded in 2012 and 2013 at 37. Ironically, this was when Malawi experienced the famous theft of government funds dubbed "cashgate." The lowest corruption score (signifying high corruption perception) was recorded in 2006 and 2007 at 27. Inflation averaged 13.8 percent, and the maximum inflation figure was recorded in 2013 at 27.28 percent, while the minimum was recorded in 2010 at 7.41 percent.

3.2. Test results

(a) Cross-sectional dependence

The results of the cross-sectional dependence are presented in Table 2. The Breusch-Pagan LM, Pesaran scaled LM, Bias-corrected scaled LM, and the Pesaran CD show that the test statistics are statistically significant for all the variables. This means that the null of no cross-sectional dependence is rejected and therefore concludes that there is cross-sectional dependence in all variables. Therefore, all subsequent tests and analyses take into account the presence of cross-sectional dependence. However, no cross-sectional dependence test is conducted for inflation and corruption as these variables are not sector-specific.

Table 2: Cross-sectional dependence test

Variables	Breusch-Pagan LM	Pesaran scaled LM	Bias-corrected scaled LM	Pesaran CD
SECGRO	9.95***	2.84***	2.75***	1.68*
TOT	35.75***	13.37***	13.29***	5.97***
REC	32.25***	11.94***	11.86***	5.64***
DEV	14.02***	4.50***	4.42***	3.66***

Note: ***, **, * denotes rejection of the null hypothesis of no cross-sectional dependence at 1%,5%, and 10% levels, respectively.

(b) Stationarity test

Against the null of unit root (no stationarity), the results in Table 3 are obtained at levels and first difference for the pooled series of the variables from the Bai and Ng test.

Table 3: Bai and Ng unit root test

Variable	Levels		First difference	
	Test statistic	p-value	Test statistic	p-value
SECGRO	-1.12	0.26474	2.04	0.04091
CORR	-1.98	0.29060	-4.22	0.00070
INF	-1.59	0.48880	-3.37	0.02400
REC	-0.12	0.90577	2.81	0.00491
DEV	4.04019	0.00005	-	-
TOT	0.65	0.51273	4.15	0.00003

In levels, the null hypothesis of a unit root cannot be rejected for all variables but Sectoral Development Expenditure (DEV). However, in first difference, the null of unit root is rejected at a 5% level of significance for the nonstationary variables, implying that the variables (except sectoral development expenditure) are integrated of order 1.

(c) Heterogeneity test

A Pesaran and Yamagata test conducted under the null hypothesis that the slope coefficients are similar produces the results presented in Table 4. The p-values for the two test statistics are greater than 0.05 and therefore the null cannot be rejected. These results prompt the use of pooled rather than grouped FMOLS in the estimation of the long-run relationship between the dependent and independent variables.

Table 4: Pesaran and Yamagata Heterogeneity test

Testing for slope heterogeneity
(Pesaran, Yamagata. 2008. Journal of Econometrics)
H0: slope coefficients are homogenous

	Delta	p-value
	-1.014	0.311
adj.	-1.297	0.195

(d) Cointegration test

The test is conducted to test if there is a long-run relationship between sectoral growth and total government sectoral expenditure, sectoral growth and disaggregated government sectoral expenditures, and sectoral growth and control variables (corruption and inflation). Appendix 1 presents the results of these three separate tests. In all the tests, at least 6 of the 11 statistics produced are significant, signifying the existence of long-run relationships.

3.3. The FMOLS Estimates

The FMOLS estimation results are shown in Table 5. Several findings are discernible. First, there is a significantly positive relationship between aggregate government expenditure on the three sectors (TOT) and the performance of the agriculture, education, and health sectors, as measured by their growth rates. Second,

corruption and inflation negatively affect the growth of the sectors.

Table 5: The effect of aggregate sectoral government expenditure on sectoral performance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOT	0.24	0.09	2.76	0.0082
CORR	1.16	0.34	3.39	0.0014
INF	-0.33	0.15	-2.28	0.0273
R-squared	0.25	Mean dependent var		2.96
Adjusted R-squared	0.12	S.D. dependent var		8.28
S.E. of regression	7.78	Sum squared resid		2722.40
Long-run variance	27.24			

The results show that a MK 1 billion increase in government total sectoral expenditure leads to a 0.24 percentage point increase in sectoral growth, ceteris paribus, and the result is statistically significant at 5 percent. This result agrees with the Keynesian theory which postulates a significant positive relationship between government expenditure and economic growth (GDP growth).

Corruption and inflation retard the growth of these sectors. The results show that an increase in inflation by 1 percentage point leads to a 0.33 percentage point decrease in sectoral growth. On the other hand, a positive relationship between corruption and sectoral growth shows that an increase in the corruption perception score (decrease in corruption) leads to an increase in sectoral growth which means that as corruption perception increases (decrease in the perception score), sectoral growth decreases as well.

When disaggregated into recurrent and development, the results from the FMOLS show that both expenditures have a positive effect on sectoral growth (Table 6).

Table 6: The effect of disaggregated government sectoral expenditures on sectoral performance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DEV	0.34	0.14	2.44	0.0186
REC	0.26	0.06	3.93	0.0003
CORR	1.05	0.24	4.29	0.0001
INF	-0.37	0.10	-3.65	0.0007
R-squared	0.24	Mean dependent var		2.96
Adjusted R-squared	0.09	S.D. dependent var		8.27
S.E. of regression	7.87	Sum squared resid		2725.61
Long-run variance	12.74174			

The results are significant at 5% level of significance for development expenditure and 1% level of significance for recurrent expenditure. The effect is also large for development expenditure. A 1 unit (MK 1 billion) increase in sectoral development expenditure leads to a 0.34 percentage point increase in sectoral growth, *ceteris paribus*. On the other hand, a 1 unit (MK 1 billion) increase in recurrent expenditure leads to a 0.26 percentage point increase in sectoral growth, *ceteris paribus*.

4.0. Conclusion and policy recommendations

As one of the developing countries that are striving to achieve economic growth and development, Malawi has, over time, been developing and implementing various policies and strategies. While allocations towards the implementation of these policies and strategies through the national budget have been increasing in both nominal and real terms, economic growth has generally been erratic and undesirable. To accurately target economic growth and development, it is important that dynamics in the various sectors of the economy are studied and analyzed. This study assessed the effect of government expenditure towards the agriculture, education, and health sectors on the performance of these sectors. We find a positive relationship between government expenditure and the growth of these sectors. When disaggregated into recurrent and development, the effect of the expenditures is higher for the development expenditure category. The results of this study point to the need for the government to continue increasing its budgetary allocations to the agriculture, education, and health sector. Adequate resource allocations towards these sectors will ensure that plans and interventions outlined in the various policy documents are successfully implemented, and intended growth is achieved. Significant growth in these sectors can eventually contribute to growth in the whole economy in general, and the desired annual 6 percent growth can be achieved, which when sustained for a period can see Malawi transforming into a middle-income country.

The revelation that development expenditure has a large effect compared to recurrent expenditure points to the need for government to prioritize the development projects in these sectors when allocating resources. Development expenditure is deemed public sector investment, and such is necessary, especially for countries like

Malawi, where huge private investment is limited due to huge sunk costs and other factors. Development projects produce spillover effects and positive externalities. Therefore, it is highly recommended that as the government increases allocations to the agriculture, education, and health sector, special attention should be given to the development (capital) expenditure component.

Government should also control inflation and encourage measures that curb corruption as it has been established that both inflation and corruption retard the growth of the agriculture, education, and health sectors.

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Appendices

1. Cointegration test results

1.1. Pedroni cointegration test for Sector growth rate and Total sectoral expenditure

	Statistic	P-value	Weighted Statistic	P-value
Panel v-Statistic	1.871793	0.0306	-1.059484	0.8553
Panel rho-Statistic	-3.121235	0.0009	-1.428796	0.0765
Panel PP-Statistic	-10.81043	0.0000	-10.29536	0.0000
Panel ADF-Statistic	-9.812158	0.0000	-7.403260	0.0000

Alternative hypothesis: individual AR coefs. (Between-dimension)

	Statistic	Prob.
Group rho-Statistic	-1.432054	0.0761
Group PP-Statistic	-18.17580	0.0000
Group ADF-Statistic	-9.315767	0.0000

1.2. Pedroni cointegration test for sector growth rate and disaggregated sectoral expenditure

	Statistic	P-value	Weighted Statistic	P-value
Panel v-Statistic	-0.091	0.5364	-1.16	0.8789
Panel rho-Statistic	-2.06	0.0194	-0.64	0.2610
Panel PP-Statistic	-7.82	0.0000	-7.57	0.0000
Panel ADF-Statistic	-7.09	0.0000	-6.43	0.0000

Alternative hypothesis: individual AR coefs. (Between-dimension)

	Statistic	Prob.
Group rho-Statistic	-0.82	0.2040
Group PP-Statistic	-9.42	0.0000
Group ADF-Statistic	-7.04	0.0000

1.3. Pedroni cointegration test for sector growth rate and corruption and inflation

	Statistic	P-value	Weighted Statistic	P-value
Panel v-Statistic	-0.88	0.8126	-1.74	0.9587
Panel rho-Statistic	-1.27	0.1025	-0.09	0.4606
Panel PP-Statistic	-7.74	0.0000	-7.87	0.0000
Panel ADF-Statistic	-6.64	0.0000	-6.13	0.0000

Alternative hypothesis: individual AR coefs. (Between-dimension)

	Statistic	Prob.
Group rho-Statistic	-0.05	0.4786
Group PP-Statistic	-9.28	0.0000
Group ADF-Statistic	-6.77	0.0000