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# FOOD IMPORT, FOOD PRICE INFLATION, WAGES AND AGRICULTURAL EMPLOYMENT IN SOUTH AFRICA

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## ABSTRACT

Agricultural industry plays a significant role in the South African economy, specifically in creating jobs. However, this sector is facing significant challenges owing to economic and social unrest. Within the application of both Autoregressive Distributed Lag (ARDL) and Error Correction Model (ECM) on time series data from 2010q1 to 2021q4; this paper assessed the effects of food imports, inflation, and real wage on agricultural employment in South Africa. The results from bounds testing indicated that food imports, inflation and real wage stimulate long-term disruptions in agricultural employment. However, short-run results indicated that agricultural employment is only affected by the real wage. Based on these findings, this study suggests a policy that incorporation of both inflation rate and real wages policy to improve employment in the agricultural industry. Additionally, easing the import of food products that are complements to domestic agricultural products should be another strategy to increase the number of people employed in the agricultural industry.

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## Introduction

The agriculture sector in South Africa is important for food production and also extends to poverty reduction and national economic growth (Daya, Ranoto and Letsoalo, 2006; Vickers, 2014; Garidzirai, Meyer & Muzindutsi, 2019). Additionally, irrespective of its informal nature, the agriculture industry contributes to job creation specifically for low-skilled labour. Owing to its contribution to economic and social development, the agricultural sector is among the largest economic sectors in South Africa (Sihlobo & Nel, 2016). Although the South African agricultural sector experienced declining

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growth in its contribution to the gross domestic product, this sector remains important regarding job creation. In 2021, for instance, this sector recorded 7 percent of the total employment (Arnoldi, 2021). Additionally, while other economic sectors were laying down their employees as a result of the coronavirus pandemic, the agricultural sector was the only one to experience employment growth during the covid-19. During the third quarter of 2021, the number of people employed in the agricultural sector increased by 829 000 which meant approximately 3 percent growth compared to 2020 (Sihlobo, 2022).

The production and employability capacity of the agricultural sector does not depend on the sector's endogenous factors. It, however, depends on other exogenous factors such as the national inflation rate, wage rate and the quantity of imported agricultural products. For instance, in March 2020 the minimum wage increased by 3.5 percent compared to 2019 and increased further in 2021 by 1.5 percent. This increase in minimum wages caused the farm worker's wage to increase by 16 percent in 2021 (Department of Employment and Labour, 2021). There are only a few studies that investigated the effect of minimum wage growth on employment. Even those conducted focused only on the relationship between employment and domestic worker. A recent study of this nature was conducted by Dinkelman and Ranchhod (2012) and its findings concluded no difference between employment levels before the introduction of the minimum wage law in 1999 and after the implementation of the law. The question here is to know if their results can be generalised to the effect of minimum wage growth on employment levels in the agricultural sector.

Another economic variable that may influence agricultural employment is the inflation rate. Since the 2008 financial crisis, food price inflation become an interesting subject for research and discussion (Ngidi, 2016). Unfortunately, while the world and South Africa, in particular, were recovering from the price shock caused by the 2008 fiscal crisis, COVID-19 came and worsened the global economic situation. The proof was that between 2019 and 2021, food inflation increased by almost 9 percent; that is 3.4 in 2019 and 5.4 in 2021. Besides the effect of COVID-19, South African food inflation was also aggravated by international commodity prices such as crude oil prices that increased by more than 30 percent (Sikuka & Geller, 2021). Some domestic drivers that contributed to food inflation in South Africa between 2020 and 2021 include electricity tariff increases that increased by more than 15 percent, and minimum wages that increased by more than 16 percent (Sikuka & Geller, 2021).

South Africa is not sufficient to produce all the needed food items for her population. Therefore, improving agricultural trade can increase food availability and thereafter reduces food inflation. The effect of agricultural trade on the South African food markets can easily be elucidated using the scenario of the war between Russia and Ukraine. Just after the Russian invasion of Ukraine, the price of Bread and cereals increased by 3.16 percent while Oils and fats increased by more than 0.45 percent. Food price inflation is still expected to increase by 6.5 at the end of this year and up to 9 percent by early 2023 ([Writer](#), 2022). In terms of food inflation growth, increasing food imports

might bring a solution to food shortages. However, an increase in food imports impedes the demand for domestic agricultural products. As suggested by the Keynesian theory of employment, low demand leads to low demand for labour, thus unemployment growth (Keynes, 1937). South Africa being a net exporter of agricultural products can experience a negative trend in its employability capacity if the level of food product imports increases.

Given the current economic situation where inflation is escalating, workers fighting for wage increments and open trading regulations, it is important to investigate the effect of changes within the aforementioned factors on agricultural employment in South Africa. The next section of this paper discusses the data and methodology employed by the study. Subsequently, the study findings are presented, and this is cussed. The last section of the study provides a concise summary of the study followed by the study implication and recommendations.

## **A brief review of the empirical literature**

### **Inflation vs employment/unemployment**

The most of theoretical literature does not focus on the relationship between employment and inflation, it rather highlights the correlation between inflation and unemployment. Consequently, the majority of empirical studies also assess the cointegration between unemployment and inflation. The early work of Phillips (1958) analysed the relationship between unemployment and wage inflation. This study's results suggested the existence of an inverse relationship between the two variables. This implies that a negative relationship exists between unemployment and inflation. In other, words, a positive relationship exists between inflation and employment. The findings of Phillips (1958) were supported by Samuelson and Solow's (1960) findings suggesting also an inverse relationship between inflation and unemployment. Phillips (1958)'s study results were supported by several studies conducted in different countries within different periods. Those studies include Al-Zeaud and Al-Hosban (2015), Furuoka (2007), Furuoka, Munir and Harvey (2013), Katria, Bhutto, Butt, Domki, Khawaja and Khalid, (2013). Contrary to the findings of the aforementioned studies, the study of Touny (2013) found a positive relationship between inflation and unemployment. Furthermore, Fuhrer, Kodrzycki, Little and Olivei (2009) argue that the trade-off between unemployment and inflation last only for a temporal period of the economic cycle. This argument was corroborated by a recent study by Buthelezi (2023) in various states of the United States where for a given period the relationship between the two variables was negative and positive for the rest of analysed period. A similar study was conducted by Egede, Aminu, Hamma and Ademola-John (2023) in Nigeria and the results confirmed those of Buthelezi's (2023) study.

## **Wage vs employment/unemployment**

Wage increment can be seen as one of the factors that enhance purchasing power of workers and thus leads to both inflation and unemployment. The study conducted by Namini and Hudson (2019) revealed that high wage stimulates inflation and unemployment within developing countries. Another study was conducted by Gandhi, & Ruffini (2022) assessing the effect of high minimum wages on employment in the United States. The study findings indicated that increasing wages leads to an increase in the number of working hours for the existing employees and thereafter reduces the employability capacity of employers as the expected production can be achieved through the extension of working hours. In other words, this study's results supported the existence of an inverse relationship between the employment rate and wage rate. Contrary to these results, the study of Neumark and Shirley (2022) also conducted in the United States, suggested that the negative effect of wage increment on employment level remains valid only for less-skilled employees and with no established industries. In support of the aforementioned findings, the study of Neumark (2018) concluded that wage increment does not come as a free lunch, but rather at the expense of job loss for low-skilled employees (workers).

## **Import flows vs Employment**

There is no sufficient empirical literature on the effect of food import on domestic employment, this is because most studies analyse the effect of trade on employment. Yet trade openness involves imports and exports. Additionally, few studies that investigated the impact of imports on employment generally focussed on the manufacturing sector rather than the agriculture sector. Nonetheless, the effect of import on local employment was analysed by Malgouyres (2016) in France. The author investigated how Chinese exports influence the labour market in France. The study results indicated that not only do the import flows reduce labour income, but they also cause a decline in employment levels. Contrary to Malgouyre's (2016) findings, the study conducted by Mohler et al. (2018) in Switzerland indicated that import flows do not destroy jobs in Switzerland. Given the shortage of literature on import's effect on the agriculture sector. The subsequent section provides approaches and methods used to analyse the implication of food import flows and other explanatory variables on employment within the South African agricultural sector.

## **Data and methodology**

### **Sample and data source**

The study followed a quantitative approach and it employed secondary data acquired from the Quantec EasyData. The data consists of quarterly observations from the first quarter of 2010 to the fourth quarter of 2021. Two reasons motivated the choice of sample size. The first motivation was built on the data availability while the second was that we intended to evaluate the effect of food import, food price and wage inflation on

agricultural employment during the post-2008 financial crisis. Since the study variables differ in terms of measurements, all variables were transformed into the natural logarithm to create a common basis and measure the responsiveness of the dependent variable towards shocks in regressors. To ensure that employed data produces effective results, the study employed stationarity and unit root tests as discussed in a subsequent section.

### Unit Root Test (Test for Stationarity)

A time-series data is said to be at a stationary state if its variance and mean are invariable over time. In other words, a nonstationary time series is one with flexible mean and variance. Using the stationary variable or series free of unit root is the only way to obtain accurate regression results. Therefore, prior to regression analysis, if a variable is not stationary at level, it has to be differenced until the unit root is taken out and the variable becomes stationary. The  $\Delta Y_t = Y_t - Y_{t-1}$  is the formula employed in taking a nonstationary variable to a stationarity level. The literature represents numerous procedures or tests to detect unit roots within a given variable. The most used tests include the Augmented Dickey-Fuller (ADF) test, the Phillips-Perron (PP) test to detect the unit roots, and the KPSS test identifies whether a specific variable is stationary or not. This study made use of the Augmented Dickey-Fuller (ADF) through equation 1 to assess the presence or absence of unit roots within variables of interest.

$$\Delta Y_t = \alpha_1 Y_{t-1} + \sum_{j=1}^p \gamma_j \Delta Y_{t-j} + e_t$$

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \sum_{j=1}^p \gamma_j \Delta Y_{t-j} + e_t \quad (1)$$

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 t + \sum_{j=1}^p \gamma_j \Delta Y_{t-j} + e_t$$

The unit test was performed under the following hypotheses:

$H_0$ :  $Y_t$  is not I(0) or  $Y_t$  has a unit root (is not stationary)

$H_1$ :  $Y_t$  is I(0) or  $Y_t$  has no unit root (is stationary)

The rejection of the null hypothesis ( $H_0$ ) implies that the variable has a unit root or is not stationary at the level. Therefore, it has to be differentiated to become stationary.

Failure to reject the  $H_0$  means that the variable is stationary at level [I(0)]. In case the ARDL approach is selected for the cointegration test, the ADF test is used to ensure that none of the used variables is I(2).

### Cointegration and ARDL model specification

Cointegrating the relationship between time series or variables infers that those variables tend to move together in the long run. Various approaches such as Engle-Granger (1987), Phillips and Hansen (1990), the Johansen-Juselius (1992) and the ARDL approach.

The ARDL approaches is often selected based on its flexibility. It can be applied to variables with different integration orders, and it also has the power to produce truthful results in a small sample size (Pesarn, Shin and Smith, 2001). Consequently, given the study sample and the author's intention to analyse the relationship among variables using a single equation, the ARDL was selected as the best model for the study.

The estimated single linear ARDL equation (2) represents the study model that elucidates the effect of food imports, food price inflation and wages on agricultural employment. The model is made of four macroeconomic variables namely food imports (FIMP), food price inflation (CPI), wage inflation (WAGE) and agricultural employment (EMP). The subsequent is the equation expressing a mathematical relationship between the aforementioned variables:

$$\begin{aligned} \Delta LEMP_t = & \alpha_0 + \sum_{j=1}^k \beta_j \Delta LEMP_{t-j} + \sum_{j=1}^k \varphi_j \Delta LFIMP_{t-j} + \sum_{j=1}^k \delta_j \\ & \Delta LCPI_{t-j} + \sum_{j=1}^k \vartheta_j \Delta LWAGE_{t-j} + \gamma_1 LEMP_{t-1} + \gamma_2 LFIMP_{t-1} + \gamma_3 LCPI_{t-1} + \\ & \gamma_4 LWAGE_{t-j} + u_t \end{aligned} \quad (2)$$

Where  $\Delta LEMP_t$ ,  $\Delta LFIMP_t$ ,  $\Delta LCPI_t$  and  $\Delta LWAGE_t$  represent denote changes in the natural log of agricultural employment, food imports, food price inflation, and wage inflation respectively in period  $t$ . while  $\beta_j$ ,  $\varphi_j$ ,  $\delta_j$  and  $\vartheta_j$  indicate the short-run coefficients, long-run coefficients are represented by  $\gamma_1$ ,  $\gamma_2$ ,  $\gamma_3$  and  $\gamma_4$ . In equation (2)  $\alpha_0$ ,  $k$  and  $u_t$  denote the intercept, lag operator and error term respectively.

The bound test for cointegration was established on the following hypotheses:

$$H_0 : \gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = 0 \text{ (no cointegration)}$$

$$H_1 : \gamma_1 \neq \gamma_2 \neq \gamma_3 \neq \gamma_4 \neq 0 \text{ (variables cointegrate)}$$

The decision to reject either  $H_0$  or  $H_1$  is made based on the comparison between the calculated F statistic and critical values. In this study, the author is interested in the rejection of  $H_0$ . The latter is rejected if the calculated F statistic exceeds the value of the upper bound critical values. The rejection of the  $H_0$  suggests that changes in independent variables (food imports, wage and food inflation) influence the long-run behaviour of the dependent variable (agricultural employment).

In case the analysed variables cointegrate, the error correction model is performed as expressed in equation 3:

$$\Delta LEMP_t = \alpha_0 + \sum_{j=1}^k \beta_j \Delta LEMP_{t-j} + \sum_{j=1}^k \varphi_j \Delta LFIMP_{t-j} + \sum_{j=1}^k \delta_j \Delta LCPI_{t-j} + \sum_{j=1}^k \vartheta_j \Delta LWAGE_{t-j} + \lambda_1 ECT_{t-1} + u_t \quad (3)$$

The  $\lambda_1$  represents error correction term (ECT) coefficient. For accuracy, the latter has to be statistically significant with a negative sign. The presence of a negative and statistically significant error term coefficient implies that any model's short deviation from the equilibrium will converge towards long-run equilibrium. Thus, the higher the ECT the faster the model towards long-term equilibrium.

### Toda-Yamamoto causality test

The causal relationship is generally established through the Granger causality test. However, this test produces accurate results only if applied to variables with the same integration order. Therefore, if a given study analyses variables with mixture integration order such as I (0) and I (1), it is important to apply the Toda-Yamamoto test for a causal relationship. Given that the Toda-Yamamoto causality test is built on the vector autoregressive (VAR) model, it is capable of estimating causation among variables irrespective of their integration order (Squalli, 2007; Meçik & Koyuncu, 2020). The application of the Toda-Yamamoto test requires first determining both the optimum lag length ( $p$ ) and the maximum integration degree ( $d_{max}$ ). The current study built the Toda-Yamamoto test on the subsequent VAR model:

$$Y_t = \alpha_0 + \sum_{i=1}^{p+d_{max}} \alpha_1 Y_{t-i} + \sum_{i=1}^{p+d_{max}} \alpha_2 X_{t-i} + u_{yt} \quad (4)$$

$$X_t = \beta_0 + \sum_{i=1}^{p+d_{max}} \beta_0 Y_{t-i} + \sum_{i=1}^{p+d_{max}} \beta_0 X_{t-i} + u_{xt} \quad (5)$$

Where Y and X (the study variables) are alternating as dependent and independent variables in each equation.

## Finding and discussion

### Descriptive statistics

The descriptive statistics of summary statistics provide basic information characteristics of the data set and the study's sample. Table 1 represents the summary of statistics for the current study. The mean for variables is 6.66, 4.42, 4.33 and 4.96 for LEMP, LFIMP, LCPI and LWAGE respectively. As displayed in Table 1, agricultural employment has a high mean value compared to other variables. This suggests that during the analysed period agricultural employment increased more compared to the other variables in the study. The kurtosis value of 3.72 indicates that the food imports variable is characterised by a leptokurtic distribution while other variables (LEMP, LCPI and LWAGE) are



characterised by platykurtic distribution as their kurtosis is less than 3. Besides, the data sample is normally distributed as the skewness values are close to zero and the Jarque-Bera's probability value is greater than 0.05 for each variable. Lastly, the standard deviation values suggest high fluctuation of the study variables. Nonetheless, wages experienced more oscillations compared to the remaining variables.

**Table 1.** Summary of statistics

	<b>LEMP</b>	<b>LFIMP</b>	<b>LCPI</b>	<b>LWAGE</b>
Mean	6.66	4.42	4.33	4.95
Std. Dev.	0.11	0.14	0.18	0.20
Skewness	-0.44	-0.62	-0.16	-0.30
Kurtosis	1.74	3.72	1.74	1.84
Jarque-Bera	4.75	4.16	3.38	3.39
Probability	0.09	0.13	0.18	0.18

### Correlation analysis

The correlation coefficient is one of the statistical measures that assist in forecasting the degree to which changes in one variable's value can cause changes in the other variable value. Table 2 displays the correlation coefficients for the study variables. The probability values of all independent variables are statistically significant implying that changes in any of these variables (food imports, wage and food inflation (CPI)) cause a change in the dependent variables (agricultural employment). Additionally, all indecent variables are negatively correlated to agricultural employment except for the inflation rate.

**Table 2.** Pearson correlation coefficients

<b>Variable</b>	<b>LEMP</b>	<b>FIMP</b>	<b>LCPI</b>	<b>LWAGE</b>
LEMP	1.00			
P-value	-----			
FIMP	-0.61	1.00		
P-value	0.00	-----		
LCPI	0.81	0.81	1.00	
P-value	0.00	0.00	-----	
LWAGE	-0.83	0.81	0.10	1.00
P-value	0.00	0.00	0.00	-----

### Unit root test

The study employed a traditional unit root test namely the augmented Dickey and Fuller (1975). The results from the test are reported in Table 3. The results indicated that only the inflation rate is stationary at level. In other words, other variables namely LEMP, LFIM, LWAGE had a unit root and became stationary after the first difference. Since variables are a mixture of I(0) and I(1) and the research focuses on a one-way relationship between variables (from independent variables to the dependent variable),



the ARDL model is the appropriate approach to assess the cointegration between variables. The next section provides and elucidates the results of bounds testing.

**Table 3.** Unit root results

Series	Levels		First difference		Integration status
	Intercept	Intercept & trend	Intercept	Intercept & trend	
LEMP	0.54	0.454	0.00**	-----	I(1)
LFIM	0.51	0.41	0.00**	-----	I(1)
LCPI	0.02	-----	-----	-----	I(0)
LWAGE	0.39	0.68	0.00**	-----	I(1)

### Bounds testing and long-run relationship analysis

Comparing two information criteria namely AIC and SBIC, the ARDL (3, 0, 0, 2) was selected as the best model to estimate both long-run and short-run relationships among variables. Table 4 reports the bounds testing for cointegration results. These results confirm that the value of calculated F-statistics (6.72) is greater than the upper bounds critical values even at 0.01 level of significance. This implies the rejection of the null hypothesis for no cointegration in favour of the alternative hypothesis for cointegration. Therefore, based on these results, it can be concluded that a long-run relationship exists between food imports, inflation, wages and South African agricultural employment. The estimated long-run relationships are summarised by the subsequent Equation 6.

**Table 4.** Bounds testing for cointegration

F-statistic	Critical value	Lower bounds	Upper bounds
6.724370	10%	2.72	3.77
	5%	3.23	4.35
	1%	4.29	5.61

$$\text{LEMP} = 1.78 - 4.81 \cdot \text{LCPI} + 0.14 \cdot \text{LFIMP} + 4.63 \cdot \text{LWAGE} \quad (6)$$

The results in Equation 6 shows that a positive long-run relationship exists between food imports, wages and agricultural employment while an inverse relationship exists between agricultural employment and inflation rate. The coefficient of inflation rate suggests that a one percent increase in the inflation rate causes agricultural employment to decline by 4.81 percent. In contrast, a one percent increase in both food imports and wages results in a 0.14 percent and 4.63 percent increase in agricultural employment. Looking at the coefficients of independent variables, one can conclude that wages and inflation rate play a very significant role in agricultural employment compared to the role played by food imports.

The negative relationship between agricultural employment and the inflation rate implies that when food prices increase while wages and income remain constant some consumers reduce their consumption. This causes low demand for agricultural products demand and consequently a reduction in labour workers' demand. On the other hand,

a positive relationship between food import and wages implies that when real wages increase consumers have enough money to spend on food. Thus, real wages increase the demand for agricultural products which leads to high demand for labour and job creation in the agricultural sector. The positive effect of food imports on employment in South African agricultural employment means that most imported goods are not produced in South Africa and may play a role in complementing South African agricultural products.

### Analysis of the short-run relationships

The error correction model (ECM) results of the cointegration estimated in Equation 6 are summarised in Table 5. The coefficient ( $\lambda_1$ ) of the error correction term ( $ECT_{t-1}$ ) possesses desired characteristics namely negative sign and statistically significant at 0.01 significant level as its absolute t-statistics is 5.398 and P-value is 0.000. The coefficient of -0.57 indicates that approximately 57 percent of short-term shocks are corrected each quarter. In other words, it takes about 1.76 ( $1/0.57$ ) quarter for any change in food import, inflation and real wage to have a full effect on agricultural employment. Considering the short-term effect of independent variables on the dependent variable, the wage is the only variable with a statistically significant effect to impact the short-term behaviour of agricultural employment. Similar, to the long-term effect of real wage on agricultural employment, the former variable positively influences short-term employment in the agricultural industry.

**Table 5.** ECM and short-run results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LEMP(-1))	0.16	0.13	1.24	0.22
D(LEMP(-2))	0.23	0.127	1.91	0.06
D(LWAGE)	1.76	0.437	4.04	0.00
D(LWAGE(-1))	-0.91	0.47	-1.95	0.06
$ECT_{t-1}$	-0.57	0.11	-5.40	0.00

### Causality analysis

When estimated variables are cointegrating, there should be at least a single causality between those variables. As the unity root suggested that variables under consideration were a combination of I(0) and I(1), the Toda-Yamamoto causality test was employed to further determine causality and short-run relationship between variables. The results reported in Table 6 indicate confirm the short-run relationship results. As indicated in Table 5, the real wage is the only significant variable to causes short-term changes in agricultural employment. Similarly, the T-Y granger causality test suggests a unidirectional causal relationship between employment and real wages. Additionally, a unidirectional relationship exists between inflation and real wages. The real wage has power has the power to cause short-term changes in employment while changes in the former variables are also caused by inflation.

**Table 6.** T-Y Granger causality test results

Excluded lags	Dependent variable			
	LEMP	LCPI	LFIM	LWAGE
LEMP	-----	0.29 (0.59)	2.47 (0.12)	0.88 (0.34)
LCPI	3.02 (0.08)	-----	1.90 (0.17)	6.59 (0.01)
LFIM	0.59 (0.44)	4.24 (0.04)	-----	2.67 (0.10)
LWAGE	3.55 (0.04)	1.53 (0.22)	2.69 (0.10)	-----

Note: P-values in brackets

### Diagnostic test

Various stability and diagnostic test were performed to ensure the robustness of results from the ARDL, ECM and T-Y approaches. Table 7 reports the summary of performed tests. The null hypothesis of all residual tests (Jarque-Bera, LM and white test) was not rejected. This implies that the residuals of employed approaches are free of heteroscedasticity, and serial correlation and are normally distributed. Furthermore, the results from conducted stability tests (Ramsey RESET, CUSUM and CUSUMSQ) indicated that the used model was correctly specified and that the model parameters are stable. In other words, the relationship between agricultural employment, real wages, food import and inflation were consistent during the analysed period.

**Table 7.** Diagnostic tests results

Test	H0	P-value	Decision
White	Homoscedasticity	0.59	Do not reject H0
LM test	No serial correlation	0.75	Do not reject H0
Jarque-Bera	Normality in residuals	0.55	Do not reject H0
Ramsey RESET	Correctness in the model specification	0.92	Do not reject H0
CUSUM	The model is stable at a 5 percent level of significance		
CUSUMSQ	The model is stable at a 5 percent level of significance		

### Conclusion and recommendations

Agricultural employment plays an important role in the South African economy and South Africans' well-being. However, in most cases researchers focus on non-agricultural employment leaving a gap in this sector. For that reason, the current study employed the Autoregressive Distributed Lag (ARDL), Error correction model (ECM) and Toda-Yamamoto test to assess the impact of food import, inflation and real wages on agricultural employment in South Africa. The study findings established a long-run relationship between food import, inflation and real wages in agricultural employment where both food imports and real wages increase the number of people employed in the agricultural industry. Nonetheless, a high inflation rate was found to impede

job creation or employment growth in the agriculture industry. When comparing the effect of the three independent variables on employment, the results indicated that food imports have a small long-run impact compared to real wage and inflation rates. This implies the seriousness of inflation and wages on employment.

The short-run results suggested that the real wage is the only variable that stimulates changes in agricultural employment. These results were confirmed by findings from the Toda-Yamamoto granger causality test where real wage was the only significant variable to cause short-term changes in agricultural employment. Given the power of real wages on agricultural employment in both the long run and short run, South African policymakers should consider policies that incorporate both inflation and real wages. High inflation impedes real wages which, in return, significantly impacts agricultural employment. Easing the import of food products that complement domestic agricultural products should be another strategy to increase the number of people employed in the agricultural sector.

### Conflict of interests

The authors declare no conflict of interest.

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