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# What is the effect of globalisation on the performance of the service sector of Ghana?

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## Abstract

The paper empirically examines the effect of globalisation on the service sector output in Ghana for the period 1961-2013 using annual time series data. The ordinary least square method of regression was employed after the unit root properties were examined. The findings of the study indicate negative effect of globalisation on the service sector output, suggesting that the Ghanaian economy has not benefited positively from globalisation. Policy makers should reconsider the use of globalisation as a policy tool in achieving growth in the service sector. The use of nonlinear models in future study is worth considering, as well as the use of other proxies of globalisation. Other regression estimation methods such as the Johansen method should be considered in future empirical studies to find out whether the current findings will be replicated.

**Keywords:** service sector output, globalisation, economic growth

**Jel Classification code:** F14, G21, G22, G23, G24, L80, L90

## 1 Introduction

The link between globalisation (see Balakrishnan, 2010 for definition) and service sector performance has received a good deal of attention in the literature (Goldar, 2014), and much has been written on the subject in developed economies and developing economies, with very few quantitative studies on the subject in the study area. According to researchers (Goldar, 2014; Gupta, 2011; Dehejia & Panagariya, 2010; Verma, 2008; Banga, 2005; Gordon & Gupta, 2004; Deardoff, 2001), globalisation is considered to have positive effect on the service sector of an economy resulting from factors such as transfer of technology, trade, inflow and out flow of foreign capital, increase in employment, and migration. Globalisation is also viewed to negatively affect the service sector performance (Rakshit, 2009; Sandiford, 2000; UNCTAD, 1999; Willmore, 1993).

Goldar (2014) reported that in India, in the growth rate of the organized services sector in real value added in the 1990s exceeded that in the 1980s, and the growth rate in the 2000s was still higher as a result of globalisation. The results from disaggregated analysis indicated that the effect of globalisation is not uniform in the service sector.

The research by Eichengreen and Gupta (2011) supported the findings of earlier findings that globalisation has positive effect on the service sector performance. The findings of the study by Banga (2005) in addition, supports the findings of previous studies that globalisation has positive influence on the performance of the service sector. The findings of the study by Gordon and Gupta (2004) were not different. They reported in their study that globalisation of the Indian economy has yielded positive growth in the service sector since 1990s.

According to Ghana Statistical Service report (2014) (GSS) on the economy, the revised GDP estimates for 2013 showed a growth of 7.1 percent over the 2012 final estimates of 8.8 percent. The Services sector recorded the highest growth of 8.9 percent, followed by Industry 7.0 percent, with Agriculture recording the lowest growth rate of 5.2 percent. The report indicates the Services Sector remains the largest sector of the economy, contributing about half,

49.5, percent of GDP in 2013 from 48.4 percent in 2012. However, the growth rates reduced from 11.0 in 2012 to 8.9 percent in 2013. The report indicates that financial and insurance activities; Information and communication activities recorded the highest growth rates of 23.2 percent and 24.7 percent respectively.

This performance the current study investigates to determine whether globalisation of the economy has contributed significantly to the sector performance. Previous research efforts to investigate the effect of globalisation on the service sector both empirical and theoretical studies has not produced consistent results in the literature and that calls for further studies to add to the literature. In the view of the researchers very few empirical works exist on the study area. The current paper fills the gap in that direction. The economy of Ghana is considered as small and very opened which according to literature is expected to positively influence the sectors of the economy, especially the service sector.

The current research paper contributes to globalisation theories by providing answers to the research questions underlying the research paper. The findings of the research paper provide policy directions to policy makers on the effect of globalisation on the service sector. The findings in addition serve as a reference material to researchers interested in the investigating the role of globalisation on the service sector. The global objective of the research paper is to contribute to the body of knowledge in the area of globalisation and growth by investigating the effect of globalisation (proxied by trade openness) on the service sector (proxied by service sector value added). The study specifically examines the nature of stable relationship between globalisation and service sector performance.

The research paper is based on the research question such as what is the nature of the relationship between globalisation and service sector? The current paper tested the hypothesis that there is significant effect of globalisation on the service sector.

The current paper focuses on the role of globalisation on the service sector of the Ghanaian economy and not the other sectors of the economy (Agricultural, and Industrial sector). Annual time series secondary data obtained from official sources (World Bank) was used and may suffer from challenges related to the use of such data. These are errors in variable, and data massage. The current paper did not consider the effect of structural breaks in examining the effect of shock to globalisation and service sector. The current paper is based on bivariate modelling and as such the findings might suffer from omitted variable bias. The rest of the paper looks at the research methodology, the results, discussions, and conclusions.

## 2. Methodology

### 2.1 The Design

The research paper is based on quantitative research design, causal studies, and explanatory using time series data. The nexus between globalisation and service sector productivity is quantified, explained, and predicted in the paper.

### 2.2 Data

The paper used annual time series data for the period 1961-2013 for Ghana. The chosen period allows enough data span to be used in the study, with a sample size of 52. Data for analysis was obtained from World Development Indicators (WDI-2012). The descriptions of the data are shown in Table 1.

Table 1 Data Description, Proxies and Sources

Data Description	Proxy	Source
Globalisation (GB)	Trade Openness	World Bank World Development Indicator (WDI)

Service Sector Productivity (SSP)	Service sector Value Added	World Bank WDI
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## 2.3 Conceptual Framework

The paper empirically examines the theoretical conceptualization of the influence of globalisation on the service sector productivity (Goldar, 2014; Gupta, 2011; Dehejia & Panagariya, 2010; Verma, 2008).

## 2.4 Empirical Model

The research paper is based on a bivariate modelling which is specified in equation (1). The dependent variable in the model is the service sector performance (SSP) (proxied by service sector value added) whereas the explanatory variable is globalisation (GL) (proxied by trade openness).

$$\ln SSP_t = a + c \ln GL_t + e_t, \dots \dots \dots (1)$$

## 2.5 Estimation Methods

The paper uses the following estimation methods: (i) Augmented Dickey-Fuller (1981) (ADF) (to examine the effects of external shocks to globalisation, and service sector performance). The ADF test is based on the null assumption ( $H_0$ ) that there is a unit root or the data are non-stationary in levels against the alternative assumption ( $H_a$ ) that the data are stationary in the series; (ii) Kwiatkowski et al. (1992, KPSS) tests to examine the effects of shocks to globalisation, and sector performance. The KPSS test is based on the null assumption ( $H_0$ ) that the data set are stationary in levels against the alternative assumption ( $H_a$ ) that the data set used are not stationary; (iii) The Ordinary Least Square method (OLS) of regression method is used to estimate link between globalisation and service sector performance in log-linear relationship form.

## 2.6 Diagnostic Methods

The following diagnostic tests were used to investigate the goodness of fit of the estimated model as specified in equation (1). The tests are: R-Square ( $R^2$ ); the adjusted  $R^2$ ; Joint significance test, J-B Normality test, Breusch-Godfred LM test, ARCH LM test, White Heteroskedasticity test; and Ramsey RESET.

The heteroskedasticity test is based on the null hypothesis that the heteroskedasticity is not present in the estimated model; the reset test for model specification is based on the null hypothesis that the model estimated is adequately specified; The LM test for autocorrelation is based on the null assumption that there is no autocorrelation in the model estimated; the test for ARCH is based on the null hypothesis that no ARCH effect is present in the model estimated; the normality test is based on null hypothesis that the errors are normally distributed in the estimated model (not skewed).

In addition, to these tests, the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) were used to examine the stability of the estimated model. The CUSUM and CUSUMSQ tests are based on the null hypothesis that all the estimated coefficients in the given regression model are stable and that there are no changes in the coefficients.

## 3 Results

### 3.1 Descriptive Results

The results on the descriptive statistics are reported in Table 2. The minimum and maximum values of GL and SSP indicate that GL varies between 6.3203 and 116.0480, whereas SSP varies between 21.8820 and 49.9280. The results show more variation in GL than

SSP. The values of the standard deviation are not larger than their mean values and as such they do not indicate more spread (dispersion) of the data from their means. The values of the coefficient of variation (C.V) indicate that GL is more volatile than SSP since the value of GL is larger than that of SSP. The values of the coefficient of skewness indicate both GL and SSP are both positively skewed however, SSP is more positively skewed than GL. The coefficient values of kurtosis shows both data are more flat-topped distribution since they are all less than zero.

**Table 2 Summary of Descriptive Statistics**  
(Using the observations 1961-2014)

Variables	GL	SSP
Mean	53.5797	33.7100
Median	44.0460	32.0040
Minimum	6.3203	21.8820
Maximum	116.0480	49.9280
Standard Dev.	27.5036	8.0133
C.V	0.5133	0.2377
Skewness	0.4284	0.7292
Ex. Kurtosis	-0.6596	-0.3559

Source: Author's Computation, May, 2016

### 3.2 Stationarity Tests

#### 3.2.1 Time Series Plots

The results in figures 1 and 2 indicate the globalisation and service sector productivity are not stationary in levels. The results of the plots in figures 3 and 4 shows that globalisation and service sector productivity attained stationarity on first differenced. The stationarity properties of the variables were scientifically examined using the ADF and KPSS tests.

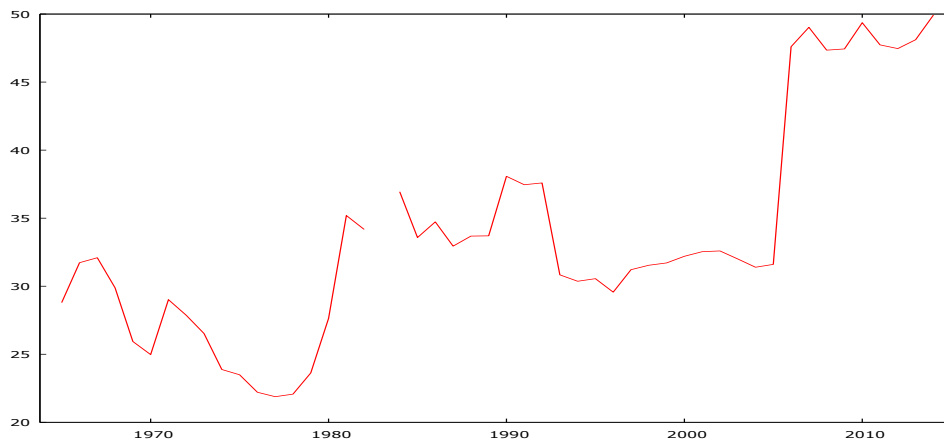


Figure 1. Time series Plot of Service sector productivity (SSP) in levels

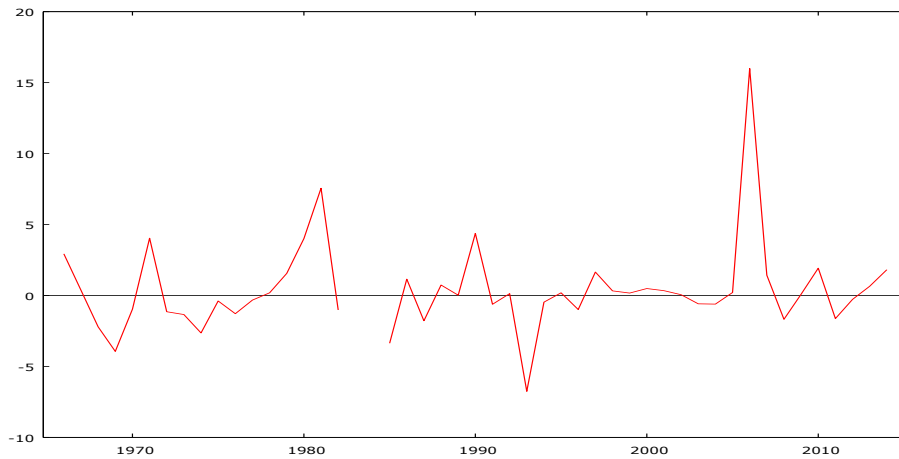


Figure 2. Time series Plot of Service sector productivity (SSP) in first difference

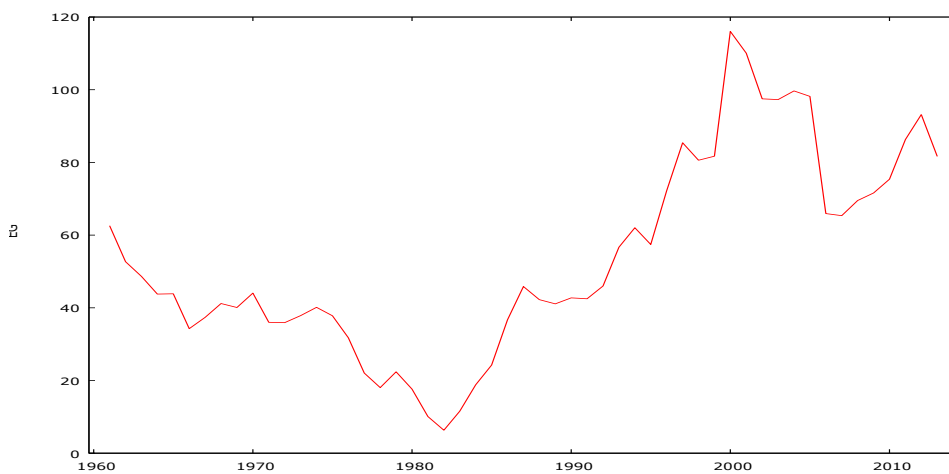


Figure 3. Time series Plot of Globalisation (GL) in levels

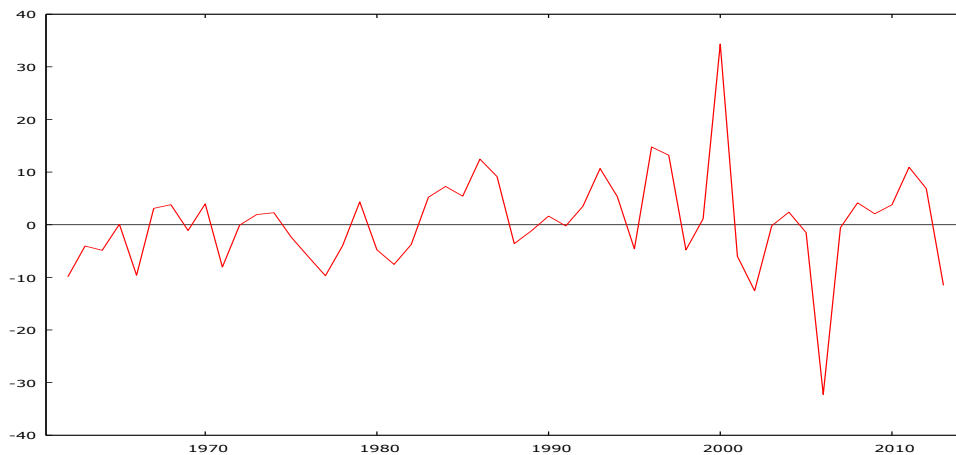


Figure 4. Time series Plot of Globalisation (GL) in first difference

### 3.2.2 The ADF/KPSS Tests for Stationarity

The ADF test results are reported in Table 3 and 4. The results indicate the series are non-stationary in levels (Table 3) but attained stationarity on first differenced (Table 4). The results of the KPSS test support the findings of the ADF test results. The variables are not stationary in levels, however, they attained stationarity on first differenced.

**Table 3 ADF Stationarity Test Results with a Constant and Trend**

Variables (levels)	Coefficients	T-statistics	ADF/P-Value	Results	Max lag length
SSP	-0.6329	-2.8225	0.1890	Not Stationary	10
GL	-0.1416	-2.0473	0.5747	Not Stationary	10

Source: Author's Computation, May, 2016

**Table 4 ADF Stationarity Test Results with a Constant and Trend**

Variables (1 <sup>st</sup> difference)	Coefficients	T-statistics	ADF/P-Value	Results	Max lag length
SSP	-0.9240	-6.4904	7.282e-006	Stationary	10
GL	-1.0988	-3.2585	0.0733	Stationary	10

Source: Author's Computation, May, 2016

**Table 5 KPSS Stationarity Test Results with a Constant and Trend**

Variables (levels)	T-statistics/P-Value	Results	Max lag length
SSP	0.1353[0.0740]	Not stationary	3
GL	0.2212[na]	Not Stationary	3

Source: Author's computation, May, 2016

Critical values at 10% (0.121); 5% (0.149); 1% (0.213) significant levels

**Table 6 KPSS Stationarity Test Results with a Constant and Trend**

Variables (1 <sup>st</sup> difference)	T-statistics/P-Value	Results	Max lag length
SSP	0.0475	Stationary	3
GL	0.1124	Stationary	3

Source: Author's computation, May, 2016

Critical values at 10% (0.122); 5% (0.149); 1% (0.212) significant levels

### 3.3. Regression Results

The regression (OLS) results on the link between globalisation and service sector productivity are reported in Table 7. The results show significant negative link between globalisation and service sector productivity for the period under discussion. The results indicate that 1% increase in globalisations leads to about 16.47% decrease in service sector productivity.

The values of the  $R^2$ (0.1592) and the adjusted  $R^2$ (0.1424) in Table 7 indicate the estimated model does not perform well. The value (adjusted  $R^2$ ) indicates that only about 14.24% of the changes in service sector productivity are explained by the model. The rests of the results on diagnostic test are shown in Table 8, figures 5, and 6. The model passed the stability test, and the autocorrelation test. However, the estimated model did not pass the normality test, the heteroskedasticity test, and the specification test.

**Table 7 OLS Regression Results**

OLS, using observations 1962-2013 (T = 52)				
Dependent variable: lnSSP				
HAC standard errors, bandwidth 2 (Bartlett kernel)				
	Coefficient	Std. Error	t-ratio	p-value
Constant	0.0127	0.0117	1.0841	0.2835
lnGL	-0.1647	0.0879	-1.8729	0.0669*

Mean dependent var	0.0118	S.D. dependent var	0.0898
Sum squared resid	0.3460	S.E. of regression	0.0832
R-squared	0.1592	Adjusted R-squared	0.1424
F(1, 50)	3.5076	P-value(F)	0.0669
Log-likelihood	56.5403	Akaike criterion	-109.0807
Schwarz criterion	-105.1782	Hannan-Quinn	-107.5846
Rho	0.0622	Durbin-Watson	1.8744

Source: Author's Computation, May, 2016

**Table 8 Diagnostic Test Results of the OLS Regression**

Tests	Results
RESET test for specification – Null hypothesis: specification is adequate Test statistic: $F(2, 48) = 5.7112$ with p-value = $P(F(2, 48) > 5.7112) = 0.0059$	The model did not pass this test. The specified model is not adequate
White's test for heteroskedasticity – Null hypothesis: heteroskedasticity not present Test statistic: $LM = 10.8284$ with p-value = $P(\text{Chi-square}(2) > 10.8284) = 0.0045$	The model did not pass this test. There is heteroskedasticity in the estimated model
Test for normality of residual – Null hypothesis: error is normally distributed Test statistic: $\text{Chi-square}(2) = 13.9365$ with p-value = 0.0009	The model did not pass this test. The residuals are not normally distributed in the estimated model
LM test for autocorrelation up to order 1 – Null hypothesis: no autocorrelation Test statistic: $LMF = 0.1932$ with p-value = $P(F(1,49) > 0.1932) = 0.6622$	The model passed this test. There is no autocorrelation in the estimated model
CUSUM test for parameter stability – Null hypothesis: no change in parameters Test statistic: Harvey-Collier $t(49) = 0.4748$ with p-value = $P(t(49) > 0.474787) = 0.6370$	The model passed this test. The estimated parameters are stable

Source: Author's Computation, May, 2016

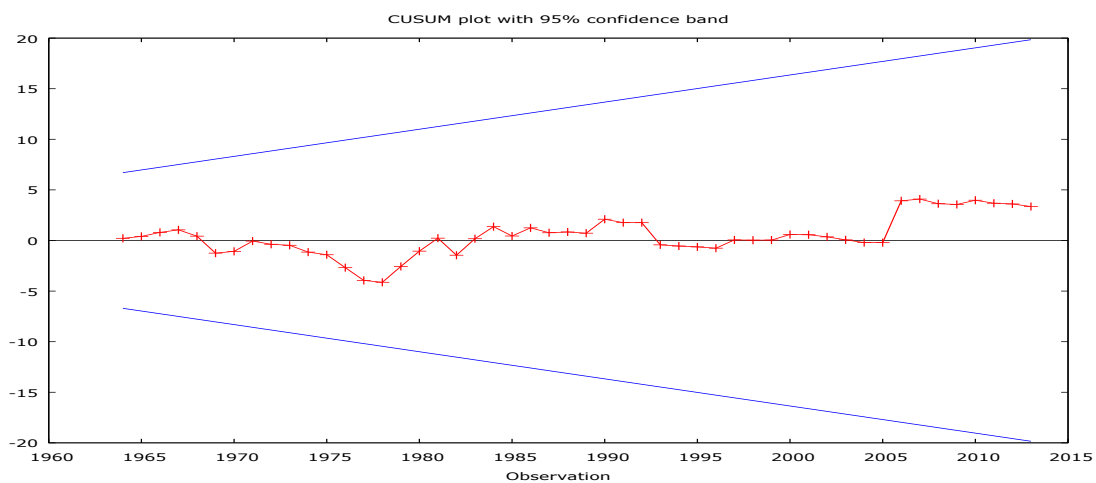


Figure 5 Plot of CUSUM



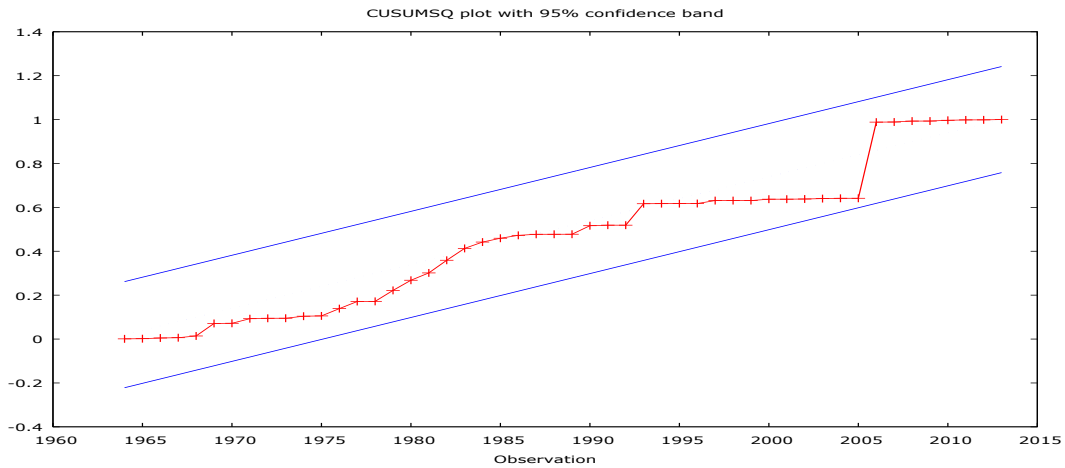


Figure 6 Plot of CUSUMSQ

#### 4 Discussions, Conclusions, and Policy Implications

The findings of negative link between globalisation and service sector productivity suggest that the service sector of Ghana has not benefited from globalisation during the period under discussion. The findings are inconsistent with that of previous researchers such as Goldar (2014); Eichengreen and Gupta (2011); Dehejia and Panagariya (2010); Verma (2008), who reported that globalisation have positive influence on the service sector productivity as a result of technology transfer, trade, inflow and out flow of foreign capital, increase in employment, and migration. However, the findings of the study support that of Rakshit (2009); Sandiford (2000); UNCTAD (1999) who explained that globalisation have negative influence on the service sector performance.

The implications of the findings are that the theories underlying the link between globalisation and service sector output must be reviewed since the current findings do not support the theoretical explanations of the positive link between globalisation and service sector output. The practical implications are that globalisation could not be used as a policy tool to influence output in the service sector.

The objective of the paper have been achieved in the current study. The association between the service sector output and globalisation have been investigated using annual time series data for Ghana for the period 1961-2013, and the ordinary least squares (OLS) regression method in a bivariate model. The findings of the study suggest negative effect of globalisation on the service sector output for the period under discussion. The findings of the research seem to suggest that, the service sector has not benefited positively from globalisation which calls for the review of the theoretical explanation of the link between globalisation and the service sector productivity/output.

Policy makers should reconsider the use of globalisation as a policy tool in achieving growth in the service sector. The use of nonlinear models in future study is worth considering, as well as the use of other proxies of globalisation. Other regression estimation methods such as the Johansen method, Vector error correction model, and the autoregressive distributed lag model should be considered in future empirical studies to find out whether the current findings will be replicated. Since the current research is based on only association study, causality studies are worth doing in future studies. Methods such as Granger-predictive test could be used in such studies.

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