

The Impact of Financial Development on Economic Growth: A Case Study of Saudi Arabia

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ABSTRACT

The interrelation between economic growth and financial development has fuelled a debate in the area of economics. The financial development of countries is driven by the concert action of their governments regarding policy making, creating favourable financial infrastructure, and taking strategic initiatives for building a conducive financial sector. This study attempts to empirically assess the association between financial development and long-run growth in the context of Saudi Arabia. It uses select variables measured by the World Bank to predict economic growth and financial development. Furthermore, it analyses the link between financial development and economic growth in Saudi Arabia from 1980 to 2020, spanning a 40-year period. It uses a five-variable ARDL model using a supply-led approach. The Granger's test of causality and the VECM propose a unidirectional relationship flowing from the proxy of financial development to economic growth. This study's findings support the idea that financial development leads to economic growth in Saudi Arabia.

Keywords: Saudi Arabia, Economic Growth, Financial Development, Autoregressive Distributed Lags, Cointegration

JEL ClassificationS: O16, E44, G21

1. INTRODUCTION

The interrelation between economic growth and financial development has fuelled a debate in the area of economics ever since the contribution of Goldsmith (1969) and McKinnon (1973). Studies have been undertaken by numerous researchers at the empirical level, and researchers have attempted to fundamentally establish financial development as a precursor of economic development. The financial development in countries is driven by the concert action of their governments regarding policy making, creating favourable financial infrastructure, and taking strategic initiatives for building a conducive financial sector. The bigger concern in this study has been how these findings can be interpreted and how the phenomena can be measured as, most of the times, researchers have been using proxy measures to study the relation between EC and FD.

This study attempts to empirically revisit the association between financial development and long-run growth in the context of Saudi Arabia. It uses select variables measured by the IMF and World Bank to predict economic growth and financial development. For a long time, the state-controlled Saudi Arabian economy has been fuelled by oil revenues. The government has been exploring alternative economic avenues to fuel growth. The Saudi Arabia economy has seen significant turmoil between 1980 and 2020; from early 1980s to mid-1980s, this economy that was fuelled by oil revenue witnessed a downturn due to recession followed by oil price crashes.

Saudi Arabia reduced its oil production to curb the price fall that affected its oil revenue. In 1990s, Saudi Arabia saw stagnating oil prices, a decline in real GDP, and an increase in unemployment. However, the period from 2000 to 2010 saw reforms, and the

recovery of economic growth stability was achieved to some extent by increasing the non-oil revenues. Again, oil prices collapsed in 2015; in response to this, the Saudi government launched the vision 2030 programme to boost economic growth; it encouraged participation of private sector, building infrastructure projects, and foreign direct investments in an attempt to reduce dependency on oil revenues. Multiple studies have studied the relationship between EG and FD. Samargandi et al. (2014) studied the relation between FD and EG with respect to Saudi Arabia. They reported that this financial indicator affects non-oil GDP significantly. Ibrahim (2013) examined the interrelationship of FD and EG in the context of SA from 1989 to 2008. The study used ordinary least squares (OLS) and found that FD predictors significantly affect EC. Alshammary (2014) studied the interrelationship between EG and capital market development indicators of SA from 1993 to 2009. The ARDL model used in this study found capital market development indicators to be significant indicators of EG. The studies on Saudi Arabia have largely been conducted in the early 2010s. This study covers the period from 1980 to 2020, a critical period during which the Saudi Arabian economy actively pursued a transition from an oil-dependent economy to a more diversified, non-oil-led economy. It also propounds that economic growth in SA had been supply-led.

The aims of this study are as follows:

1. To evaluate the short-term and long-term relationships between economic growth and financial development predictors;
2. To probe into the direction of causality between the predictor variables in the ARDL model;
3. To provide strategy policy implications for the Saudi government.

2. THE LITERATURE ON FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH

Economic growth captures the production of goods and services in a country and is generally measured by gross domestic product (GDP). The increase in production from one period to another is referred to as economic growth, and the nominal measure for it is generally GNP or GDP. The real measure for economic growth is GDP adjusted for inflation. Another popular measure of economic growth has been the annual GDP growth percentage. Economic growth can occur when an economy makes more goods and services to meet growing domestic demand or for export. Economic growth also happens when capital goods, labour, technology, and human capital all grow. The total market value of new goods and services generated is commonly used to measure economic growth.

There are numerous indications for inferring that economic growth is driven by financial development. Kamal (2013) studied the impact of mobilising savings, ensuring control, assigning funds, and increasing innovation on economic growth. The theoretical link between financial development and economic growth was further established by Schumpeter (1911; 1934) whose work explores the relationship between EG and FD and emphasizes the

critical role of financial intermediation in promoting innovation and economic development.

However, researchers have been questioning the relationship between FD and EG; as an economic system grows, the need for financial services also grows, thus questioning the FD to EG nexus (Robinson, 1960). The bi-directional nature of this relationship can be summarised into two well-developed competing concepts. The first being demand push that supports the thought process that financial development happens due to the push from economic growth. Contrarily, the supply-led approach proposes that FD translates into EG as countries develop robust financial institutions that promote financial services required for EG. Economic growth is an intricate process affected by a multitude of factors, which is yet to be completely understood; thus, it is often difficult to isolate the causal role of financial development in its creation.

3. FINANCIAL DEVELOPMENT

The financial development of most economies has been powered by strategic actions such as reforms in the banking system, liberalisation of government policy, and development of capital markets. The growth and expansion of the banking system was considered a significant precursor of economic growth (Gurley and Shaw, 1967; Goldsmith, 1969). Demetriades and Luintel (1996) proposed that the banking system controlled the interest rate, which impacted the relationship between financial development and economic growth in the Indian economy. In contrast to the previous study that used aggregated macroeconomic data, Neusser and Kugler (1998) sought to comprehend the correlation between industrial sector GDP, financial sector GST, and overall productivity.

The supply-leading hypothesis supports the fact that the economic development of a country can be energised by financial development (Patrick, 1966). Patrick pioneered the empirical study of causal direction and distinguished between supply-leading and demand-following patterns. He suggested that measures such as interest softening, better access to financial services, and better information flow stimulate the economy to create a more productive environment.

The neo-liberal school promotes market-led reforms and financial liberalisation, its most important theorists are McKinnon (1973) and Shaw (1973). Roubini and Sala-i-Martin (1995) explored the position of government policy and financial development; their model states that government policies can both restrict and enable financial markets. It has been observed that the tendency of tax evasion often leads to restrictive policies by government, in turn generating high inflation tax. Restricted policies lower the productivity of capital and hamper growth. With a different view, De Gregorio (1993) studied saving rates and how they are affected by financial market developments. They concentrated on borrowing restrictions and economic growth. Their study showed that relaxing borrowing constraints often leads to increase in economic growth. The positive relationship between economic growth and real interest rates was observed by Dornbusch (1988), irrespective of the channel of transmission. However, he reported

that savings are not related to the level of real interest rates. Fry (1998), in contrast to the above finding, reported a strong positive effect of real interest rates on financial savings. The efficiency of capital accumulation can be well represented by positive real interest rates as suggested by Khan and Villanueva (1991). Calvo and Coricelli (1992) reported that real interest rates often reflect fragile financial structures and reduced regulatory settings in Eastern European economies.

Romer (1994) and Lucas (2009) presented the dynamic endogenous growth model, which supported the relationship between EG and FD (King and Levine, 1993). The assumption of the endogenous model is that fiscal intermediaries offer a country numerous classes of benefits such as lowering investments, liquidity, and productivity risks and facilitating information for better decision making. The service provided by intermediaries helps in improving effectiveness and the level of investments. This, in turn, leads to economic growth as per the endogenous model. The study based on capital allocation in investments and its impact on financial structure was developed by Greenwood and Jovanovic (1990), who suggested that, based on capital accumulation, there is a positive influence of financial structure on growth. Benhabib and Spiegel (2000) proposed a model where financial development exhibited a positive relationship with total productivity. Beck et al. (2000) reported a positive association linking FD and total factor output, which overall impacts GDP growth and was supported by other studies (Demirguc-Kunt and Levine, 2008; King and Levine, 1993; Demetriades and Hussein, 1996; Khan and Senhadji, 2000).

The nexus between FD and EG has addressed the controversial issues of causality. Earlier studies explored this relationship based on various foundations proposed by economists. Empirical results show that the direction of causality is sensitive to the indicator used for FD; while some indicators confirm the relation, the others may show contradictory results. The causal association linking FD and EG has been studied both in the long term and the short term using a regression study. However, the study results suggest a positive relationship that depends on the predictor used as an alternate for FD. The context of this study regarding countries' economics, endogeneity, and heterogeneity is being evaluated in ongoing studies.

4. FINANCIAL DEVELOPMENT MEASURES

Another important concern along with the direction of relationship between EG and FD has been around the indicators of FD. Most researchers have used macroeconomic, banking, or fiscal indicators as proxy measures for FD. The literature uses diverse indicators to represent the "level of financial development," including interest rates, monetary aggregates, and the ratio of the banking system's size to GDP (Al-Awad and Harb, 2005; Chuah et al., 2004; among others).

A critical point in understanding the relationship between FD and EG is finding a valid indicator for FD. The frequently used indicator of FD is derived from the measurement of narrow money and broad money as a share of nominal revenue (King and

Levine, 1993; Wood, 1993; Murinde and Eng, 1994; Lyons and Murinde, 1994; Berthelemy and Varoudakis, 1995; Arestis and Demetriades, 1997; and Agung and Ford, 1998). M2 and M3 are suggested for use as a less liquid monetary aggregate (De Gregorio and Guidotti, 1995). Another popular proxy for FD is BDY (bank deposit liabilities to income); it is known to be higher in developed economies, as it reflects the rigorous use of money rather than increasing deposits (Demetriades and Hussein, 1996; Luintel and Khan, 1999).

Domestic credit to income DCY positively linked to price signalling regarding real interest rates can be used as a proxy for FD (Odedokun, 1989). Similarly, private sector credit (CPY) proportion may be used, and the loans given to the business community can encourage investments and outputs, which can then contribute to economic growth. The IMF has developed several indexes that can be used to measure financial development in an economy (Svirydzenka, 2016).

5. METHODOLOGY

The study duration was from 1980 to 2020, which includes a period of liberalisation, reforms, and development in Saudi Arabia. During this period, SA also saw an increase in monetary growth and improvement in investments in the non-oil sector. The data span 40 years and are enough for an ARDL model to study the interrelationship between EG and FD. This study also revisited the debate on the causality between EG and FD.

5.1. Dependent Variable

GDP per capita growth rate was considered as an alternate to study economic growth.

5.2. Independent Variables

This study explores five independent variables to be used as surrogates for financial development. We derived these indicators from banking sector financial intermediaries and monetary and fiscal policy measures.

Domestic loans provided by banks as a percentage of GDP (DCBS) was the first important indicator. Higher DCBS indicates the dependency of the corporate sector on banks for funding. It is an indicator of financial development in a country. Banks are more likely to drive investments in a country.

Domestic credit to the private sector (DCPS) is the second indicator for FD. It is measured as credit to the private sector as a percentage of GDP and indicates the level of credit flow to the private sector. A higher level of DCPS suggests the economy is diversifying from the government sector to the private sector.

The third proxy is broad money (M3) as a percentage of GDP, which measures the liabilities of the banking sector and reflects the depth of financial intermediation. In contrast, M2 is not considered as comprehensive an indicator, as its ability to channel funds from savings to investment is more limited (Khan and Senhadji, 2000).

Gross domestic savings (GDS) as a percentage of growth rate is the fourth financial development indicator. Pagano (1993) reports that GDS affects EG, ensuring that a significant percentage of the savings are devoted to investments.

The fifth measure of FD is final consumption expenditure (FCE). It measures the size of the financial sector and the significance of fiscal policy. It shows which sectors are being encouraged to grow by ensuring the flow of investments by a government. FCE is measured as percentage of government expenditure to GDP growth.

To study the order of integration of all the variables, the Augmented Dickey–Fuller test (ADF) was conducted. All variables were first tested for stationarity at level and subsequently were also tested for first differences. Table 1 shows that all variables are integrated at different orders.

GDPPC, M3, GDS, and FCE are integrated at the first difference I(1). DCBS is not integrated at either level or first difference.

6. EMPIRICAL RESULTS

Based on the endogenous growth literature (Romer, 1994; King and Levine, 1993), the role of financial development and economic growth is established; it is expected that the mobilisation of the financial sector through financial services' investments and allocation of resources facilitates economic growth (Roubini and Sala-i-Martin, 1995).

6.1. Cointegration Test

Interpretation of cointegration: Null hypothesis = no cointegration between independent variables. Alternate hypothesis = cointegration exists between independent variables.

To analyse the cointegration properties of the estimated equation, the ARDL bounds testing approach was used. One of the advantages of the testing method is that it can be applied irrespective of whether the regressors are integrated of order zero I(0), order one I(1), or mutually cointegrated.

Table 2 provides the computed value of the F-statistic for testing the existence of a long-run relationship in the GDPPC equation under the null hypothesis of no cointegration between independent variables. The F-statistic is compared with the critical bounds I(0) and I(1); if the F-statistic is less than the lower bound I(0), we fail to reject the null hypothesis of no cointegration. In the present case, at the 1% level, the lower bound critical value of I(0) is 5.018 and the upper bound I(1) is 6.61; since the computed F-statistic is 8.13, which exceeds the upper bound of 6.61, we reject the null hypothesis and accept the alternate hypothesis. This confirms that M3/GDP, FCE/GDP, and GDS/GDP are cointegrated at the 1% significance level.

To further confirm the cointegration relationship, the Johansen cointegration test was conducted. Table 3 presents the Johansen

Table 1: ADF unit root tests

Variable	I (0) Dickey–Fuller	I (1) P-value	Dickey–Fuller	P-value
GDPPC	−2.6806	0.30	−3.928	0.02
M3	−3.0425	0.16	−3.8376	0.02
GDS	−1.6763	0.70	−3.5241	0.05
FCE	−1.4555	0.78	−3.5375	0.05
DCBS	−1.2340	0.56	−2.6031	0.16
DCPC	−1.2108	0.88	−4.5703	0.01

Table 2: Cointegration test (Pesaran et al., 2001)

Significance level	I (0)	I (1)
10%	2.933	4.02
5%	3.548	4.803
1%	5.018	6.61
F-statistics	8.14	

Table 3: Johansen procedure: Test statistic

Hypothesized No. of CE(s)	Test	10 pct	5 pct	1 pct
$r \leq 3$	0.13	6.5	8.18	11.65
$r \leq 2$	12.81	15.66	17.95	23.52
$r \leq 1$	39.01	28.71	31.52	37.22
$r = 0$	81.33	45.23	48.28	55.43

trace test statistics. We compare the test statistic with the critical value at the 5% level of significance; if the test statistic is greater than the critical value, we reject the null hypothesis.

Starting with $r = 0$ (no cointegration), the test statistic (81.33) exceeds the critical value (48.28), so we reject the null hypothesis. Moving to $r \leq 1$ (at most one cointegrating vector), the test statistic (39.01) exceeds the critical value (31.52), so we again reject the null hypothesis. Testing $r \leq 2$ (at most two cointegrating vectors), the test statistic (12.81) is less than the critical value (17.95), so we fail to reject the null hypothesis. This confirms that there are two cointegrating vectors among the variables.

6.2. Econometric Model

The autoregressive distributed lags (ARDL) model is employed to examine the determinants influencing the economic growth measured by GDPPC. Pesaran and Shin (1995; 1999) and Pesaran et al. (2001) made this model. This study used five proxies for financial development; of the five proxies, only three variables exhibited a significant relationship with economic growth (Table 4).

The ARDL model shows that domestic credit to the private sector and domestic credit as a percentage of GDP are not significant predictors of GDPPC; thus, they were excluded from the final model. Table 4 shows the results of the econometric model and the long-term relationship between predictors of economic growth. Gross domestic savings had a positive impact on GDP growth both at the current level as well as at the first lagged value. M3 has a positive impact on GDPPC at the lagged value t-2. Government expenditure showed mixed effects: A significant positive impact at lag t-1 (1.00728, $P < 0.01$) and a significant negative impact at lag

Table 4: Long-term relation between economic growth and financial development

Variable	Estimate	Standard error	t-value	Pr(> t)
(Intercept)	-15.91620	4.41209	-3.607	0.00148
GDS.t	0.27083*	0.10606	2.554	0.01775
GDS t-1	0.37680*	0.17370	2.169	0.04065
GDS t-2	0.15947	0.12747	1.251	0.22350
M3.t	0.05109	0.17091	0.299	0.76766
M3.t-1	-0.12021	0.22052	-0.545	0.59092
M3.t-2	0.48906*	0.17438	2.805	0.01006
FCE t	-0.25719	0.28804	-0.893	0.38116
FCE t-1	1.00728**	0.34897	2.886	0.00833
FCE t-2	-0.94240**	0.28096	-3.354	0.00275
GDPPC.1	0.05963	0.16432	0.363	0.72002
GDPPC.2	-0.05195	0.11838	-0.439	0.66488
GDPPC.3	0.05202	0.11075	0.470	0.64303
GDPPC.4	-0.05789	0.10519	-0.550	0.58738
Adjusted R-squared	0.627			
F	5.667	0.000158		

Superscripts denote significance levels: ***P<0.01, *P<0.05

Table 5: ECM—short-term relationship between economic growth and financial development

Variable	Estimate	Standard error	t-value	Significance
(Intercept)	-11.98761***	2.47219	-4.849	6.79×10 ⁻⁵
ec. 1	-0.68049***	0.19035	-3.5749	1.31×10 ⁻⁵
GDS t	0.24437*	0.09503	2.572	0.017058
GDS t-1	-0.2593*	0.11031	-2.351	0.027691
M3.t	-0.04214	0.1367	-0.308	0.760667
M3 t-1	-0.47084**	0.15327	-3.072	0.005394
FCE.t	-0.44088	0.21424	-2.058	0.051107
FCE t-1	0.82566***	0.20412	4.045	0.000503
FCE t-2	-0.49837*	0.22938	-2.173	0.040354
dGDPPC.1	0.18461	0.14832	1.245	0.225788
dGDPPC.2	-0.03738	0.13416	-0.279	0.782999
dGDPPC.3	0.10225	0.11055	0.925	0.364578
dGDPPC.4	0.07071	0.09557	0.74	0.466864
Adjusted R-squared	0.756			
F	9.968	0.00018		

Superscripts denote significance levels: ***P<0.001, **P<0.01, *P<0.05

t-2 (-0.94240, P<0.01), indicating complex dynamic relationships with economic growth. The model was robust, and the predictor variables explained 62.7% of the variation in GDPPC, as seen in the R-squared value in Table 4.

6.2.1. Error correction model

To conduct a comprehensive investigation of the drivers of GDPPC in SA, it is essential to estimate an ARDL error-correction model to identify the short-run correlations between variables. The results are shown in Table 5.

The error correction term reflects the impact of deviations from the long-run equilibrium. The error correction term in each equation indicates how each variable tends to restore equilibrium during the change in GDPPC. The results in Table 5 indicate that the error correction term is negative and significant, and its value is -0.68, which means that a return to equilibrium in the dynamic model is possible; therefore, the variation that occurs in the short term is corrected annually (given that the data are annual). The negative coefficient indicates that the deviation from the long-term equilibrium is corrected at a rate of almost 68%.

6.2.2. Granger's causality test

The test for cointegration indicates that at least two vectors are cointegrated as they share a common trend. Since the relevant variables have a common trend, Granger's causality must exist at least in one direction (Granger, 1988). To examine the direction of causality among the variables, Granger's causality test was conducted within the VECM framework. Table 6 presents the results of the Granger causality test. Applying the Granger's causality approach demonstrates that a unidirectional causality is running from M3 to GDPPC and from FEC to GDPPC. This further strengthens the supply-led growth model of economic development being used in this study.

To ensure the reliability and validity of the ARDL model estimates, several diagnostic tests were conducted. Table 7 presents the results

Table 6: Granger's causality test

Dependent variable	GDPPC	M3	GDS	FCE
GDPPC	—	0.0033	0.068	1.4007
M3	11.057***	—	5.9418**	0.5354
GDS	2.54*	0.4951	—	15.6***
FCE	0.3966	9.1868***	0.352	—

Values shown are F-statistics. Superscripts denote significance levels: ***P<0.001, **P<0.01, *P<0.05. Null hypothesis: Variable in row does not Granger-cause variable in column

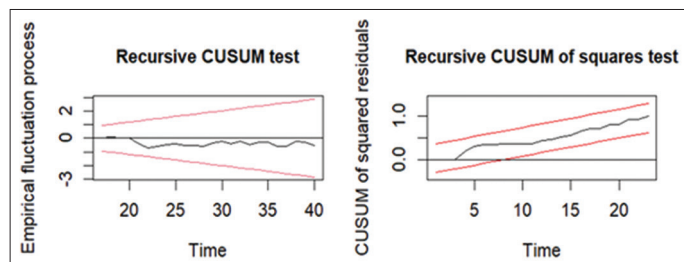
Table 7: Diagnostic tests to gauge adequacy of model specifications

Test	Statistic	Df	P-value
Ramsey's RESET test for model specifications	1.9307	df1=2, df2=22	0.1786
Shapiro-Wilk test for the normality of residuals	0.97861	—	0.6982
Breusch-Pagan test for the homoskedasticity of residuals	9.5626	df=13	0.8463
Ljung-Box test for the autocorrelation in residuals	3.27×10 ⁻⁶	df=1	0.9986
Breusch-Godfrey test for the autocorrelation in residuals	4.61×10 ⁻⁶	df1=1, df2=19	0.9983

of diagnostic tests to assess the adequacy of model specifications and the validity of classical regression assumptions. Traditional tests are used to diagnose the model according to its assumptions. The Breusch-Godfrey test and Ljung-Box test are used to evaluate autocorrelation in residuals. The Shapiro-Wilk test assesses the normality of residuals. The Breusch-Pagan test evaluates the homoskedasticity of residuals.

The CUSUM and CUSUM-squared test proposed by Brown et al. (1975) can be applied to test the stability of the long-term relation between GDPPC and its predictor. The test is applied to the residuals of the model. If the plots remain within the boundary at 5% significance, then stability is confirmed. In Figure 1, we see that the line stays within the boundary indicated by the

Figure 1: CUSUM and CUSUM² stability tests. Both statistics remain within the 5% significance boundaries (red lines), indicating parameter stability over the period 1980-2020



red line in both graphs, validating the stability of the GDPPC equation.

7. DISCUSSION AND CONCLUSION

This study assessed the cointegration, Granger's causality, and short- and long-term dynamics in the causal relationship between economic growth (EG) and financial development (FD). We applied the ARDL Bounds Testing approach to determine the cointegration, the error correction model (ECM) for long- and short-run dynamics, and the Granger's causality test in the VECM framework. We report that the following variables as predictors of GDPPC.

GDS is important for every country as it favours economic growth by encouraging investments and capital formation (Kazmi, 2001). Domestic savings safeguard economies by providing internal financing capacity and reducing vulnerability to external shocks. GDS has a positive and significant impact on the GDPPC growth. The GDS has a mixed impact on GDPPC; it depends on where the savings are channelized. It has both a current as well as a lagged impact.

M3 is commonly referred to as broad money and has been used as a financial development indicator by Darrat (1999) and Kar et al. (2011). It is a general measure of monetisation, as used by King and Levine (1993), and a measure of the size of the financial market and its depth. An increase in M3 indicates the expansion in financial intermediaries. The findings of this study confirm the significant impact of M3 on economic growth; however, this impact occurs at a two-period lag ($t-2$), indicating that changes in broad money supply affect economic growth with a delay of approximately 2 years.

On the one hand, the government can fuel economic growth by allocating resources to sectors that can drive economic growth. On the other hand, the government cannot spend a lot of money since it needs to borrow money and pay taxes for this purpose. However, borrowing might make investments more expensive, push private investments out of the way, and raise taxes in the future. Therefore, government expenditure has both positive and negative impacts on economic growth. This is also demonstrated by the findings of this study: the lagged effect is positive while the current effect is negative.

Taking all this into consideration, the Saudi Arabian government should review its existing policy interventions to promote economic growth. This study provides a road map to the government and a clear direction for financial interventions that may help the economy to grow in a particular direction. The final consumption expenditure of the government should be channeled toward investments that increase GDPPC, thus enhancing the growth of several sectors and the economy. From a policy standpoint, any solitary or individual policy initiative on macroeconomic variables, such as GDS, FCE, and M3, will not yield good outcomes. Thus, a policy that combines different macroeconomic variables will help a country such as SA.

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9. DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

10. CONFLICTS OF INTEREST

The author declares no conflicts of interest.

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