

Investigating the Causal Relationship between Financial Development and Economic Growth in Nigeria and South Africa.

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Abstract: *This paper examined the causal relationship between financial development and economic growth in Nigeria and South Africa by employing co integration test, VECM and granger causality test using the data of annual time series for the period 1980 – 2014. The objective of the study is to examine the applicability or otherwise of stage of development hypothesis of financial development by Hugh Patrick (1966) in both countries which states that the direction of causality between financial development and economic growth changes over the course of development. The result of granger causality indicates a unidirectional causality running from financial development (DCPSGDPN) to economic growth in Nigeria and a bidirectional causality from financial development (DCPSGDPS) to economic growth in South Africa validating the Supply leading hypothesis of financial development by Hugh Patrick (1966). This study therefore concludes that supply – leading phenomena (Finance – led growth) is evident in both Nigeria and South Africa economies. The Johansen multivariate co integration test indicates 2 co integrating vectors in both countries, showing a long run relationship between ratio of broad money supply to GDP (M2GDP), ratio of domestic credit to private sector to GDP (DCPSGDGP), real interest rate (RLINTR) and economic growth (GDPPC). The VECM result shows that the ratio of broad money supply to GDP has no significant impact on economic growth in Nigeria and South Africa but the ratio of domestic credit to private sector to GDP has significant impact on economic growth in both countries. This study therefore recommends that priority should be given to the development of the financial sector in Nigeria and South Africa.*

Key words: *Broad money supply, domestic credit, Economic growth, VECM, Finance – led growth, causality*

I. Introduction

South Africa developed a sophisticated financial system, borne out of the mining boom of the late 1800s. As such, one would expect South Africa to exhibit robust economic growth, not like other middle income nations that have similar financial systems and economic histories. South Africa economic performance is crucial for the development of the Sub-Saharan African region as it is by far the largest economy on the continent after Nigeria by nominal gross domestic product (GDP) definition, with the second oldest stock exchange on the continent behind Egypt (Gondo, 2009)

South Africa's GDP is three times greater than the GDP of all the other Southern African Development Community (SADC) countries combined. In addition, South Africa is the main trading partner of all the SADC countries; and this underscores the importance of the South Africa economy. If such an economy experiences a depression, the other SADC countries will be affected through the contamination effect. The financial services sector for South Africa is one of the best on the African continent on the basis of its performance and stability. Some of the South African banks have gone international and they have subsidiaries in most Southern African countries, for example, First National Bank, Ned Bank and Standard Chartered Bank (Sunde, 2012), (Andrew, 2014). South Africa experienced political change to democracy in 1994; the financial sector underwent liberalization to adopt free-market principles and the economy was under recessionary pressure with increasing inflation, unemployment and disinvestment in the economy by foreign investors.

Since 1986, the Nigeria monetary authorities have adopted various measures aimed at developing the financial system and reducing the level of financial repression in the system (Ugwuanyi, Odo and Ogbonna 2015). The financial system comprises various financial institutions, instruments and regulators (Oluita, 2010). The central Bank of Nigeria (CBN) (CBN, 2013), describe financial system as a set of rules and regulations and the aggregation of financial arrangements, institutions, agents, that interact with each other and the rest of the world to foster economic growth and development of a nation. The financial system serves as a catalyst to economic development through various institutional structures (Nzotta, 2009). The system seek and attract the reservoir of savings and idle funds and allocate same to entrepreneurs, businesses households and government for investment projects and other purpose with a view of returns. This forms the basis for economic development (Ugwuanyi, Odo and Ogbonna, 2015).

Financial development is the process that marks improvement in quantity, quality and efficiency of financial intermediary service. This process involves the interaction of many activities and institutions and possibly associated with economic growth (Ugwuanyi, Odo and Ogbonna, 2015).

Nouren (2009) defines financial development as the policies, factors and the institutions that lead to the efficient intermediation and effective financial markets. Financial reforms have been a regular feature of both Nigeria and South Africa financial system. The reforms have evolved in response to the challenges posed by development in the system such as systematic crisis, globalization, technological innovation and financial crisis. The process of financial sector reform consists of the movement from an initial situation of controlled interest rates, poorly developed money and securities market and under – developed banking system, towards a situation of flexible interest rates, and prolonged role for market forces in resource allocation, increased autonomy for the central bank and a deepening of the money and capital markets. According to Kehinde and Adejuwo (2011), financial sector reforms have tried to address the financial gap in the system, remove rigidities in the system of credit allocation and control and achieve positive real interest rates and greater efficiency by the market operators in the intermediation process.

Meshack (2003), Emilie (2009) suggests that for the smaller countries with less developed financial institutions, to derive the optimal gains from financial intermediation, they would need to take steps to strengthen their weak financial system and resolve the institutional and structural problems in their economies. According to the studies, an obvious lesson for countries contemplating forming or entering economic integration, in particular a monetary union is that the development of their financial system and addressing other institutional and structural problems will be a necessary precondition for deriving optimal gains from such integration.

Kiteng (2013) analyzed the causality relationship between financial developments and economic development in South Africa. The pair wise Granger causality test was applied to data of South Africa from 1966 to 2008 under Vector Error Correction Mechanism. Empirical analysis revealed two major facts, firstly, the economic growth Granger causes the financial development.

Secondly, there exist long-run and short-run causality relationships from economic growth to bank assets. A boom of economic activities seems to be the driving force behind the improvement of financial sectors. Consequently, policies aiming to foster the financial sector in South Africa should include the nature of increased economic activities.

Akpan (2005) notes that the link between the financial sector and the growth of the economy in Nigeria has been weak. The real sector of the economy which is said to be economic growth drivers is not effectively and efficiently serviced by the financial sector. Audu, Pelesia and Pearce (2013), notes that Nigerian banks concentrate on short term lending as against the long term investment which form the bedrock of a virile economic transformation.

From 1980 to 2013, financial sector development indicators have not been relatively stable in Nigeria (Ugwuanyi, Odo and Ogbonna, 2015). Frank and Eric (2012) recommends that Government should encourage competition in the financial sector and micro finance development as these will improve and increase outreach and access to credit at a lower cost. This will boost private sector development and investments which is the engine of growth and development.

In 1980,1990,2000,2014 in South Africa the ratio of M_2 to GDP (M_2 GDP) and ratio of domestic credit to private sector to GDP (DCPSGDP) as financial sector indicators were about 53.7, 53.8,52.,71.00 and 55.6,81.00,130.3,151.6 respectively. On the other hand, economic growth in 1980 was 6.6, in 1990, it was -03 and 2000, 2014 it was 4.2&1.5(World Development Report, 2014) . While in 1980 in Nigeria, the ratio of M_2 to GDP (M_2 GDP) and ratio of domestic credit to private sector to GDP (DCPSGDP) as financial sector indicators were about 12.2% and 28.6% respectively. These dropped to 11.5% and 20.55% respectively in 2013. On the other hand, the economic growth witnessed remarkable fluctuations between 1980 and 2014. For instance, in 1980, it was 4.2%, in 2009 it was -13.13% and 2013 it rose to 9.7% (CBN, 2012). These fluctuating trends call for investigation into the finance growth nexus in Nigeria and South Africa hence this study. The result will be important to policy makers both in analyzing and determining the best policy mix to ensure financial development and stable real sector growth in both countries.

This work is structured into five sections, section one comprises the introductory background of the study. Section two covers the theoretical framework and literature review. Section three gives information about the research methodology. Section four deals with empirical result and discussion. Section five is the conclusion.

II. Theoretical Framework And Literature Review

2.1 Theoretical framework

Financial system acts as a critical intermediary by effectively reallocating resources to newer and more efficient businesses, finance serves a necessary function in promoting economic growth. The importance of the financial sector in providing the necessary capital to fund real economic activities especially the manufacturing sector which is regarded as an engine of economic growth and development cannot be over emphasized.

Patrick (1966), postulate stage – of – development hypothesis that involves a “supply – leading” and a “demand – following” phenomenon. The “supply – leading” hypothesis postulates that the development of the financial

system will lead to economic growth while the “demand – following hypothesis” posits that as real economic growth takes place in the economy, it will spark the demand for financial services. Based on this development hypothesis, researchers assert that a feedback relationship may exist between financial development and economic growth. For demand – following hypothesis, it can also be called “growth – led finance” hypothesis. It states that the growth of the economy generates additional and new demand for financial services, which bring about a supply response in the growth of the financial system (Patrick, 1966). This hypothesis suggests a demand – following relationship between financial and economic development.

2.2 Empirical literature

Earlier studies like Schumpeter, (1911); McKinnon, (1973), Shaw, (1973) note the importance of financial services and the critical role financial intermediaries play in stimulating economic growth (Ugwuanyi, Odo and Ogbonna, 2015). Demetriades and Hussein (1996), in their view were not convinced that finance strengthens economic growth rather financial development follows economic growth. Studies by Sajibo and Adekanye (1992) and Nnanna (2004) notes the importance of bank deposits and bank lending behavior in the level of productive investment and output growth in Nigeria. Recent studies revealed that financial sector development has significantly improved the level of economic performance in Nigeria and countries with well developed financial institutions tend to grow faster, especially the size of the banking system and the liquidity of the stock markets tend to have strong positive impact on economic growth. In Nigeria, the link between the financial sector and real sector is still weak to propel the needed economic growth (Victor and Samuel, (2004); Abdulsalam and Ibrahim (2013); Adekunle, Salami and Adedipo, (2013).

Sunde, T (2012) investigated the nexus between financial sector development and economic growth in South Africa using co integration and error correction modeling and; the Granger causality tests. The results of the study show that economic growth is explained by the financial sector variables and control variables such as inflation, exchange rate, and real interest rates. The Granger causality test results show that there is generally a bidirectional relationship between economic growth and financial sector development which implies that if the economy grows the financial services sector also grows and vice versa. Kiteng (2013) also analyzed the causality relationship between financial development and economic growth in South Africa . The pair wise Granger causality test was applied to data of South Africa, from 1966 to 2008, under Vector Error Correction Mechanism. Empirical analysis revealed two major facts. Firstly, the economic growth Granger causes the financial development. Secondly, there exist long-run and short-run causality relationships from economic growth to bank assets. A boom of economic activities seems to be the driving force behind the improvement of financial sectors. Consequently, policies aiming to foster the financial sector in Nigeria and South Africa should include the nature of increased economic activities.

Equally, other studies by Okpara (2010), Audu, Pelesai and Pearce, (2013) and Ugwuanyi, Odo and Ogbonna (2015) find that financial liberalization strengthens the relationship between financial development and economic growth. But contrary to these findings, Akpan (2005), finds that following financial liberation, the economy has failed to experience any impressive performance. This study tends to support the view that financial development leads to economic growth, thus, attesting to “*Finance – led growth*” hypothesis. This controversy of “supply – leading and “demand – following” (“growth – led finance”) hypothesis calls for more empirical studies hence the need for this study especially as it affects the two leading economies in the continent, Nigeria and South Africa.

III. Data And Method Of Analysis

3.1 Data

The data used for this study are the time series covering 1980 – 2014 periods and are obtained from online service from – data.worldbank.org/indicators and world development indicators 2014. The choice of the time frame is informed by the following considerations:

- (i) The period is wide enough to enable good deductions to be made that will influence or redirect policy decisions.
- (ii) The relevant data for the study are available.

3.2 Method of Analysis

This study made use of economic procedure in estimating the relationship between the variables. The Vector Error Correction Model (VECM) was employed in obtaining the numerical estimates of the coefficients of the equation. The VECM is used only when the variables are co integrated. The Augmented Dickey - Fuller (ADF) tests were used to test the stationarity of variables. Equally, Johansson co integration procedure was used to test the existence of long run equilibrium (stationary) relationship among the economic variables. In demonstrating the application of VECM, the multiple linear regression analysis was used where the GDP per capita (GDPPC), the ratio of M₂ to GDP (M₂GDP), the ratio of domestic credit to private sector to GDP

(DCPSGDP) and real interest rate (RLINTR) were the relevant variables. The GDPPC was used as the dependent variable while the M_2/GDP , DCPS/GDP, RLINTR were the independent variables. The selection of this method was justified because the data were time series and all time series data exhibits a random walk.

3.3 Model Specification

This study employed a multiple linear regression while the theoretical basis of this study is anchored on stage of development hypothesis of financial development by Hugh Patrick (1996) which states that the direction of causality between financial development and economic growth changes over the course of development. That is, at the early stage of development “the supply – leading” is evident but as real growth occurs in the economy, it will spark demand for financial services. The general model adopted from the works of Yanique (2012) is

$$\Delta Y_t = \mu + \sum_{i=1}^{p-1} \Phi_i \Delta Y_{t-i} + \Psi U_{t-i} + PX_t + \varepsilon_t \dots \dots \dots (1)$$

where:

Δ is the first difference operator,

Y_t is a $n \times 1$ vector of variables consisting of GDPPC, the ratio of M_2 to GDP and ratio of credit to private sector to GDP, RLINTR.

X is a set of control variables,

μ is a $n \times 1$ vector of deterministic variables,

Φ is a $n \times n$ coefficient matrix,

Ψ determines the number of co integrating relationships,

U is the correcting term,

ε is a $n \times 1$ vector of disturbance with normal properties.

The VECM is used only when the variables are co integrated. In this study, we adopted VECM because of the co integrating nature of the variables. The functional relationship of the variables presented as

$$GDPPC = f(M_2GDP, DCPSGDP, RLINTR) \dots \dots \dots (2)$$

where:

GDPPC = GDP per capita

M_2/GDP = ratio of M_2 to GDP,

DCPS/GDP = ratio of domestic credit to private sector to GDP.

RLINTR= real interest rate

The model is expressed in a mathematical equation as

$$GDPPC = b_0 + b_1 M_2/GDP_{t-1} + b_2 DCPS/GDP_{t-2} + b_3 RLINTR + U_t \dots \dots \dots (3)$$

where:

U_t = the white noise random element and $b_0 + b_1 + \dots + b_n$ are parameters.

IV. Empirical Results And Discussion

4.1 Unit Root Test

We first tested if the relevant variables in equation (3) were stationary as well as determining their orders of integration. We applied the Augmented Dickey – Fuller (ADF) to find the existence of unit root in each of the time series. The result of the ADF tests is presented on table 1&2 for Nigeria and South Africa.

Table 1: Augmented Dickey – fuller Unit Root Test Result - Nigeria

| Variables | At Level | At 1 st Diff | 5% Level |
|-----------|-----------|-------------------------|-----------|
| GDPPCN | 0.566845 | -5.992719 | -3.552973 |
| DCPSGDPN | -2.696888 | -5.085894 | -3.552973 |
| M2GDPN | -2.683763 | -5.088324 | -3.552973 |
| RLINTRN | -6.232965 | - | -3.548490 |

Sources: Authors’ computation 2016 using E – view 7.0

Table 2: Augmented Dickey – fuller Unit Root Test Result – South Africa

| Variables | At Level | At 1 st Diff | 5% Level |
|-----------|------------|-------------------------|-----------|
| GDPPCS | 1.298569 | - 4.509060 | -3.552973 |
| DCPSGDPS | - 4.844540 | - | -3.548490 |
| M2GDPS | - 1.475102 | - 3.669400 | -3.552973 |
| RLINTRS | - 4.954057 | - | -3.548490 |

Sources: Authors’ computation 2016 using E – view 7.0

4.2 Co integration Test

Having confirmed the stationary of the variables at 1(0) and 1(1), we proceeded to examine the presence or non presence of co integration among the variables. When a co integration relationship is present, it means that GDP per capita (GDPPC), ratio of M2 to GDP (M2GDP), real interest rate (RLINTR) and ratio of domestic credit to private sector to GDP (DCPSGDP) share a common trend and long run equilibrium. Table 3&4 shows the result of the co integration test for Nigeria and South Africa.

Table 3: Unrestricted Co integration Rank Test (Trace) - Nigeria

| Hypothesized No. of CE(s) | Eigen value | Trace statistics | 0.05 critical value | Prob.* |
|---------------------------|-------------|------------------|---------------------|--------|
| None | 0.711601 | 75.06252 | 47.85613 | 0.0000 |
| At most 1* | 0.464957 | 34.02994 | 29.79707 | 0.0153 |

Trace test indicates 2 co integrating equations at the 0.05 level, * denotes rejection of the hypothesis at the 0.05 level, ** Mackinnon – Haug – Michel (1999) P – value.

Table 4: Unrestricted Co integration Rank Test (Trace) – South Africa

| Hypothesized No. of CE(s) | Eigen value | Trace statistics | 0.05 critical value | Prob.* |
|---------------------------|-------------|------------------|---------------------|--------|
| None | 0.548755 | 63.64979 | 47.85613 | 0.0009 |
| At most 1* | 0.529531 | 37.39019 | 29.79707 | 0.0055 |

Trace test indicates 2 co integrating equations at the 0.05 level, * denotes rejection of the hypothesis at the 0.05 level, ** Mackinnon – Haug – Michel (1999) P – value.

Table 5: VECM with P – values, Nigeria

| Error correction: | Coefficient | Std. Error | T – statistics | P – values |
|--------------------------------------|-------------|------------|----------------|------------|
| cointEq1 = C (1) | 0.151559 | 0.023832 | 6.359517 | 0.0000 |
| D(GDPPCN(-1)) = C(2) | -0.779243 | 0.261079 | -2.984705 | 0.0060 |
| D (DCPSGDPN (-1)) = C (3) | -4857.638 | 2043.137 | -2.377539 | 0.0248 |
| D (M ₂ GDPN (-1)) = C (4) | 295.8920 | 1675.710 | 0.176577 | 0.8612 |
| D (RLINTRN (-1)) = C (5) | 233.0575 | 195.5882 | 1.191572 | 0.2438 |
| C = C (6) | 26294.80 | 5322.925 | 4.939917 | 0.0000 |

R² = 0.646261, F – statistics = 9.87, Prob (F – statistics) = 0.000019, DW = 2.366850

Sources: Authors’ computation 2016 using E – view 7.0

From the results in Table 5 above, the t – statistics for M₂GDP is -0.176577 while its P value is 0.8612 and the chosen level of significance is 0.05 that is less than the P value, it shows that the ratio of broad money supply to GDP (M₂GDP) has no significant impact on economic growth in Nigeria. Equally, the results in Table 5 above shows the t – statistics for DCPSGDP is -2.377539 while its P – value is 0.0248 and the chosen level of significance is 0.05 that is greater than the P value, it shows that the ratio of domestic credit to private sector to GDP (DCPSGDP) has significant impact on economic growth in Nigeria. From Table 5, the coefficient of ECM (1) is 0.151559 which is positive but its P value is 0.0060 that is less than 0.05 level of significance satisfy the second condition of statistical significance. The computed coefficient of determination (R² = 0.646261) shows that 64.62% of the total variation in the dependent variable are accounted for by the variation in the explanatory variable while 35.38% of the total variation in the GDPPC is attributable to the influence of other factors not included in the regression equation.

Table 6: VECM with P – values, South Africa

| Error correction: | Coefficient | Std. Error | T – statistics | P – values |
|---------------------------------------|-------------|------------|----------------|------------|
| cointEq1 = C (1) | 0.013240 | 0.009570 | 1.383462 | 0.1779 |
| D(GDPPCS(-1)) = C(2) | 0.737464 | 0.114128 | 6.461734 | 0.0000 |
| D (DCPS/GDPS (-1)) = C (3) | 17.78853 | 6.198007 | 2.870041 | 0.0079 |
| D (M ₂ /GDPS (-1)) = C (4) | 84.34464 | 51.04614 | 1.652321 | 0.1101 |
| D (RLINTRS (-1)) = C (5) | -45.72993 | 34.46619 | -1.326806 | 0.1957 |
| C = C (6) | 542.7376 | 252.7039 | 2.147721 | 0.0409 |

R² = 0.787145, F – statistics = 19.97, Prob (F – statistics) = 0.000000, DW = 2.429409

Sources: Authors’ computation 2016 using E – view 7.0

From the results in Table 6 above, the t – statistics for M₂GDP is 1.652321 while its P value is 0.1101 and the chosen level of significance is 0.05 that is less than the P value, it shows that the ratio of broad money supply to GDP (M₂GDPS) has no significant impact on economic growth in South Africa. Equally, the results in Table 6 above shows the t – statistics for DCPSGDPS is 2.87004 while its P – value is 0.0079 and the chosen level of significance is 0.05 that is greater than the P value, it shows that the ratio of domestic credit to private

sector to GDP (DCPSGDP) has significant impact on economic growth in South Africa. From Table 6, the coefficient of ECM (1) is 0.013240 which is positive and its P value is 0.1779 which is greater than 0.05 level of significance contrary to its condition of statistical significance. Ogbonna (2012) opine that the error correction model must be negative and significantly different from zero. A negative coefficient of the error correction model implies that in the event of a deviation between actual and long run equilibrium level, there would be an adjustment back to the long run relationship in subsequent periods to eliminate this discrepancy. Perhaps, a negative and significant coefficient of the ECM indicates that any short term fluctuations between the independent variables and the dependent variables will give rise to a stable long run relationship between the variables. However, a positive and non significant ECM does not invalidate a regression result (Gujarati, 2005) which means that in the event of a deviation between actual and long run equilibrium level, there will be no adjustment back to the long run relationship in subsequent periods to eliminate this discrepancy which invariably will require a different economic policy prescription to mitigate the attendant economic situation. The computed coefficient of determination ($R^2 = 0.787145$) shows that 78.71% of the total variation in the dependent variable are accounted for by the variation in the explanatory variable while 21.29% of the total variation in the GDPPC is attributable to the influence of other factors not included in the regression equation.

Table 7: Pair wise Granger Causality, Lag 1- Nigeria

| Null Hypothesis: | Obs | F-Statistic | Prob. |
|--|-----|-------------|--------|
| DCPSGDPN does not Granger Cause GDPPCN | 34 | 17.6026 | 0.0002 |
| GDPPCN does not Granger Cause DCPSGDPN | | 0.05301 | 0.8194 |
| M2GDPN does not Granger Cause GDPPCN | 34 | 6.14273 | 0.0188 |
| GDPPCN does not Granger Cause M2GDPN | | 0.10845 | 0.7441 |

Table 8: Pair wise Granger Causality, Lag 1- South Africa

| Null Hypothesis: | Obs | F-Statistic | Prob. |
|--|-----|-------------|--------|
| DCPSGDPS does not Granger Cause GDPPCS | 34 | 8.32039 | 0.0071 |
| GDPPCS does not Granger Cause DCPSGDPS | | 7.12560 | 0.0120 |
| M2GDPS does not Granger Cause GDPPCS | 34 | 0.98932 | 0.3276 |
| GDPPCS does not Granger Cause M2GDPS | | 0.62702 | 0.4345 |

The result of pair wise granger causality in table 7&8 reveals that there is unidirectional causality running from DCPSGDPN to GDPPCN in Nigeria as indicated by the p-value of 0.0002 and bidirectional causality between DCPSGDPS and GDPPCS in South Africa with p-values of 0.0071 and 0.0120.

V. Conclusions

This study has empirically investigated the causality and impact of financial development on economic growth in Nigeria and South Africa by employing co integration, VECM and granger test causality test using the data of annual time series for the period 1980 – 2014. The Johansen multivariate co integrate test indicates 2 co integrating equations in both countries, showing a long run relationship between ratio of broad money supply to GDP (M2GDP), ratio of domestic credit to private sector to GDP (DCPSGDP),real interest rate(RLINTR) and economic growth (GDPPC). The VEC result shows that the ratio of broad money supply to GDP has no significant impact on economic growth in Nigeria and South Africa but the ratio of domestic credit to private sector to GDP has significant impact on economic growth in both countries.

The results support the findings by Victor and Samuel; Abdulsaliem and Ibrahim; Adekunle, Salami and Adedipe that the financial sector is still weak to propel the needed economic growth in Nigeria and South Africa. The results suggest that economic growth can be enhanced through increases in ratio of broad money supply to GDP and ratio of domestic credit to private sector to GDP for there to be significant impact on economic growth. The result of granger causality indicates a unidirectional causality running from financial development (DCPSGDPS) to economic growth in Nigeria but a bidirectional causality still from financial development to economic growth in South Africa validating the Supply leading hypothesis of financial development by Hugh Patrick (1996) which states that the direction of causality between financial development and economic growth changes over the course of development. That is, at the early stage of development “the supply – leading” is evident but as real growth occurs in the economy, it will spark demand for financial

services. This study therefore concludes that supply – leading phenomena is evident in both Nigeria and South Africa economies.

Thus, if the objective of a policy is to sustain high rate of economic growth in both countries, priority should be given to the development of financial sector. An effective flow of finance to private sector economy is capable to stir prospective investors to invest and raise the nation’s productivity. This can be achieved by a good monetary policy instruments (M2GDP and DCPSGDP) inclusive mix.

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