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Is Health Care Necessity or Luxury Good? Panel Data Analysis on the Example of the SEEHN Countries

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The main goal of this paper is oriented on examining the potential link between economic growth and health expenditure in the South-Eastern European Health Network (SEEHN) countries over the period 1995–2014 by applying panel econometrics. The panel co-integration testing approach and panel VECM are used to investigate the long- and short-run causality between the economic growth, health expenditure and life expectancy (trivariate model). The empirical results show that there is a long-run relationship between the observed variables. It was confirmed that health is a luxury good in the long term, while it is a necessity product in the short term. Finally, it should be noted that economic policy in these countries should be directed to the targeted increase in expenditure on health care, in order to increase overall economic activity. Also, the economic policy should be oriented to adequate combination of public and private financing in health care.

Key Words: health expenditure, economic growth, South-Eastern Europe Health Network, panel co-integration, panel VECM

Introduction

Health has been a clear objective since the founding of the United Nations, when the Universal Declaration of Human Rights set striving to achieve 'the highest attainable standard of physical and mental health' (Sachs 2014). In many segments of the world, this goal has not been fully realized. Making progress in the area of health and economic development represents major challenges of modern times. Health issues are very sensitive in every society. Providing good health services in budget-conscious environments, such as South East European countries, presents

the question of a great importance. According to SEE 2020 Strategy (Regional Cooperation Council 2013), sustainable growth will only become a reality if there is a strong expenditure in human capital, such as health. On the basis of numerous theoretical and empirical studies, which will be mentioned further in this paper, health is seen as a significant factor that has a great positive effect on the economic growth. On the other hand, the growth of economic activities improves the material conditions of life, and thus should have a positive impact on health. In order to promote health, governments of South Eastern Europe countries formed SEEHN (South-Eastern Europe Health Network) forum. Despite notable improvements in health care, SEEHN has identified a lot of weaknesses, such as lack of financial sustainability, demographic ageing, and so on. Modernization of health care policy in the SEEHN countries is one of the prerequisites for further integration process. These are the reasons why the countries of South-Eastern Europe Health Network will be discussed in this analysis. Regarding the foregoing, the main goal of this study is to investigate the relation between health expenditures and economic growth on the sample of SEEHN countries in the period 1995–2014.

Contribution of the paper is as follows. Firstly, the current study for the first time has used the panel data covering the SEEHN countries for revealing the nature of relation between health expenditure and economic growth. Secondly, this study employs Pesaran second generation panel unit root test to determine the order of the integration of panel series. Thirdly, we use simultaneously Pedroni and newly developed Westerlund co-integration analysis to confirm the test results. The findings of this study may also serve as a form of tutorial to the other small open economies with similar health challenges. Also, to the best of the author's knowledge, there is no study which tested the empirical regularity on the long-term relationship between health care and economic growth on the sample of SEEHN countries. This article is organized in five sections: apart from the introductory remarks, the second section provides recent literature overview of links between health expenditures and economic growth. In the third section, we introduce the data and starting from the model, in which it is assumed that economic growth and health expenditure are two-way related, the basic econometric tests that will be used in the work are shown. In the fourth section, the results of the research and discussion are presented. Finally, the fifth section presents the concluding remarks and policy implications.

Literature Review

Pioneer research into the relation between the economic growth and health expenditure is present in the studies of Kleiman (1974) and Newhouse (1977). Specifically, they found a positive relation between health variables and economic growth. Theoretically speaking, it can be said that higher output means more money, which among other things means greater expenditure in health care (Fuchs 1998). Because of the significant expenditure in healthcare during the last four decades, Elk et al. (2010) pointed out that it is important to get more insights about the role of health as a determinant of growth. According to Lucas (1988), health care can be seen as the engine of growth, since the expenditure in health care involves the investment in human capital, which provides workers with better health, higher productivity and ultimately, a higher level of output (Barro 1991). These statements about the potential relations between health and economic growth are clearly related to a positive relationship between these two variables. Conversely, it is important to point out the research conducted by Acemoglu and Johnson (2006), which showed that an increase in the life expectancy leads rather to a larger increase in the total population than in the economic growth, which ultimately reduces output per capita. So, here we have a negative relation between the variables. However, Acemoglu and Johnson (2006) stated certain limitations of this result, among which stands out the fact that the results relating to a period of more than 60 years may not be applicable in today's environment. Ye and Zhang (2018) highlighted that in order to improve the quality of national health, life quality and happiness, OECD countries should actively look to optimize policy related to health care expenditure, such as by enhancing the efficiency of health costs to promote sustainable economic development. Wang and Lee (2018) showed that economic growth stimulates health expenditure growth, but health expenditure growth reduces economic growth. The above-mentioned theoretical attitudes found their place in empirical studies too, on the basis of which it is possible to distinguish four key types of causal relations between health expenditure and economic growth. Each of these relations carries with itself certain policy implications. Therefore, in accordance with the results of previous studies, the causal relations between these two variables are categorized into the following groups:

- Growth hypothesis implies unidirectional causality from health expenditure to economic growth. The implication of this result is eco-

nomic growth dependence from the investments in health expenditure. Among others, the results in accordance with this hypothesis are obtained in the researches of Devlin and Hansen (2001), Bloom and Canning (2008), Bukenya (2009), Magazzino (2011), Majdi (2012). Also, Erdil and Yetkiner (2009) show that one-way causality runs from health to income in high-income countries.

- Growth detriment implies unidirectional causality from the economic growth to health expenditure. This direction of causality can also be called the 'income view.' With this result, the economic growth is a key determinant of growth in health expenditure. This hypothesis is in accordance with the empirical results of Hartwig (2010), Chen et al. (2013), Ozturk and Topcu (2014), Khan et al. (2016), Halici-Tuluce, Dogan, and Dumrul (2016).

- Feedback hypothesis implies a two-way causality between health expenditure and economic growth. The increased investment in health expenditure leads to creating a healthier environment, increased productivity and higher output. On the other hand, a higher level of output will involve a higher demand for the health care system. The implications of this hypothesis are related to the fact that excessive control of costs in the health system may limit the economic activity. The empirical results in accordance with this hypothesis can be found in the studies of Pradhan (2010), Tang (2011), Chen, Clarke, and Roy (2014).

- Neutrality hypothesis implies the absence of a causal relation between these two variables. Newhouse (1977) gives the explanation of this result, noting that in this case, the formation of the appropriate health care policy should not depend on the economic activity. This result was confirmed in the studies of Cetin and Ecevit (2010), Balaji (2011).

In contrast to afore-mentioned findings, Chen (2015) pointed out that none of these four types of causality are valid for USA over the entire period of 1934–2010. It is evident that in the empirical studies that have examined the relation between health expenditure and economic growth, ambiguity of the results exists. The results are not consistent. The reason should be sought in the fact that during the study of the connection between the variables, several approaches were used while modelling this connection. Gerdtham and Lothgren (2000) distinguish the following econometric approaches, which are most commonly used: cross-section

bivariate regressions, cross-sectional multivariate regressions, panel data models and cointegration analysis. By applying the panel cointegration analysis, Gerdtham and Lothgren (2002) indicate that health expenditure and GDP are cointegrated around linear trends. The panel data were also used in the following studies: Hitiris and Posnett (1992), Barros (1998), Roberts (1999), Baltagi and Moscone (2010).

With the implementation of the appropriate economic policy, it is important to calculate the income elasticity for health care as well. This is very important for the financing model itself as well as for the health care resource distribution. If the income elasticity of health care is greater than one, then health expenditures will be considered as a luxury good. This implies that the health expenditures increase faster than income. Proponents of the idea that healthcare is a luxury good feel that it should be treated like any other good and should be left to the functioning of market forces. On the other hand, health care expenditures could be a necessity good. This suggests income increases faster than health expenditures. Proponents of the idea that this good is necessary for life, support the idea of the government intervention in the healthcare sector of a country (Di Matteo 2003).

In previous studies, as well as in the case of establishing causality between the variables, there is no agreement between the authors whether the healthcare is a luxury or a necessity good. Blazquez-Fernandez, Cantarero, and Perez (2014) revealed increasing income elasticity over time along with huge heterogeneity across OECD countries. Chen, Lin, and Chang (2009) indicate that health care is necessity for countries with per capita income lower than $ 1920 per year and is luxury for other countries. According to Kleiman (1974), Newhouse (1977), Leu (1986), Gerdtham et al. (1992), Schieber and Maeda (1999), Getzen (2000), Musgrove, Zeramdini, and Carrin (2002), Murthy and Okunade (2009), Hassan et al. (2014), Khan and Mahumud (2015), healthcare is a luxury good, while Freeman (2003), Sen (2005), Yu and Chu (2007), Baltagi and Moscone (2010), Narayan, Naeayan, and Smith (2011), Farag et al. (2012), Yavuz, Yilanci, and Ozturk (2013), Khan et al. (2016), Pattnayak and Chadha (2016), Abdullah, Siddiqua, and Huque (2017), consider it as a necessity good.

Data and Methodology

In accordance with the primary objective of this study, the following hypotheses will be tested:

H1 *There is a long-run relationship between the economic growth and health expenditures.*

H2 *Health expenditures generate the economic growth.*

H3 *The rate of economic activity largely determines health expenditures.*

In that sense, three variables will be used: Gross domestic product (GDP), health expenditure (HE) and life expectancy (LE). This study uses gross domestic product and health expenditure as variables of interest, while life expectancy is used as a control variable. To test the potential link between the variables, we used a sample of the SEEHN countries (Albania, Bulgaria, Bosnia and Herzegovina, Croatia, FYR Macedonia, Moldova and Romania) and panel data set from 1995 to 2014. Information on the movement of the variables is taken from the World Bank website (http://www.worldbank.org), that is, World Development Indicators. Economic growth is expressed by the gross domestic product (GDP), which is measured by the purchasing power parity in the international prices (constant 2011$), while for the healthcare expenditure, indicator Health expenditure (HE) is used as well, measured by the purchasing power parity in the international prices (constant 2011$). Life expectancy is measured at birth, total (years). The values of GDP and HE variables are displayed per capita, while for statistical reasons, the values of all indicators are shown in logarithmic form (ln). The total number of observations is 140 (20 time periods in 7 countries). Table 1 shows the descriptive statistics in these countries during the mentioned period of time. The South Eastern Europe countries differ in their overall level of the economic development. According to the World Bank country classification (see http://www.worldbank.org), Moldova belongs to lower-middle income economy, Albania, Bosnia and Herzegovina, Bulgaria, FYR Macedonia and Romania are upper-middle income countries, while Croatia is high-income economy. Also, the highest level of health expenditure is realized in Croatia, and the lowest in Moldova. Moreover, the life expectancy in Moldova is lower than in all other observed countries. Visually speaking, HE is in line with the level of GDP per capita.

Numerous theoretical assumptions listed above, emphasize the importance of investing in health care to increase the economic growth, and the impact of total output on variations in the health care expenditure. Expenditure in health care should enable the absence of chronic diseases and should increase labour productivity, by which the economic prosperity can be affected, as well. A higher level of the economic growth implies

TABLE 1 Descriptive Statistics in the SEEHN Countries (1995–2014)

Category	Country	Mean	Std. Dev	JB*
GDP per capita	Albania	6977.756	2213.898	1.726
	Bulgaria	12298.23	3116.458	2.406
	B&H	7354.182	2265.241	2.652
	Croatia	17995.38	2846.805	1.813
	FYR Macedonia	9707.933	1567.024	2.096
	Moldova	3249.976	800.479	1.568
	Romania	14166.81	3476.459	2.312
HE per capita	Albania	389.335	135.739	1.884
	Bulgaria	721.440	364.756	1.303
	B&H	562.655	276.251	1.679
	Croatia	1137.250	427.876	2.233
	FYR Macedonia	636.351	132.717	1.350
	Moldova	290.697	148.864	2.340
	Romania	568.916	335.862	2.190
LE	Albania	75.491	1.783	1.694
	Bulgaria	72.559	1.386	0.973
	B&H	74.733	1.352	2.71
	Croatia	74.879	1.809	1.856
	FYR Macedonia	73.879	0.981	1.141
	Moldova	68.218	1.637	2.601
	Romania	71.951	1.902	0.867

NOTES   * Jarque and Bera (1980).

a higher income, too, and thus the expenditures in health care should be increased. On this basis, it could be said that there is a positive two-way causality between these variables. Accordingly, we assume that the connection between the economic growth and health expenditure can be summarized as follows:

$$\ln(\text{GDP})_{it} = \theta_i + \beta_1 \ln(\text{HE})_{it} + \beta_2 \ln(\text{LE})_{it} + \varepsilon_{1,it}, \tag{1}$$

$$\ln(\text{HE})_{it} = \gamma_i + \alpha_1 \ln(\text{GDP})_{it} + \alpha_2 \ln(\text{LE})_{it} + \varepsilon_{2,it}, \tag{2}$$

where $i = 1, 2, \ldots, N$ is the index of the country, $t = 1, 2, \ldots, T$ is the time index, $\beta_1, \beta_2, \alpha_1,$ and α_2 indicate the long-term effects of the independent on the dependent variable, and θ_i and γ_i are country-specific fixed ef-

HO: No cross-section dependence in residuals	Probability
Breusch-Pagan LM test	0.0000

fects, while $\varepsilon_{1,it}$ and $\varepsilon_{2,it}$ are error terms. Taking into account that poten-
tial existence of common shocks among selected countries could result
in creating contemporaneous correlation, it is very important to spec-
ify cross-sectional dependencies. Breusch and Pagan (1980) LM test for
cross-equation correlation is used for testing cross-sectional dependence,
because the number of time periods (T) is larger than cross-sectional
units (N). The result of the cross-sectional independence test is reported
in table 2. Probability value is below the 0.05, the effect is statistically sig-
nificant. The Breusch-Pagan LM test strongly rejects the null hypothesis
of no cross-sectional dependence. In that sense, the second generation
panel unit root test should be used. The second generation tests imply
that there is a correlation between individual units of panel. Since exis-
tence of the correlation between cross-sectional data is already shown,
this study applies the test developed by Pesaran (2007).

In order to determine long-term relationship, Pedroni (1999) test of co-
integration in a panel has been used here. The null hypothesis that vari-
ables are not co-integrated is tested against the alternative hypothesis that
variables in a panel are co-integrated. The Pedroni panel co-integration
test can be presented in the following form:

$$y_{it} = \theta_i + \rho_i t + \beta_{1i} x_{1it} + \cdots + \beta_{Mi} x_{Mit} + \varepsilon_{it}, \tag{3}$$

where M is the number of regressors, β_M is the coefficient, θ_i and ρ_i rep-
resents deterministic components. Pedroni defines seven types of such
tests. The first four tests (within groups) are based on the separate eval-
uations of models for individual units. By grouping the obtained results,
the variable dimension is formed, according to which co-integration is
evaluated. The second group of tests (between the groups) implies that
evaluation is being performed for each separate unit, and then relevant
value of test statistics is formed according to the mean value of Dickey
Fuller statistics for all i units. The next test that will be used to exam-
ine the cointegration is Westerlund (2007). Based on the error correction
model (ECM), this test implies four panel cointegration tests (Ga, Gt, Pa
and Pt). These four test statistics are normally distributed and based on
structural dynamics rather than residuals dynamics. Also, they do not in-
clude any common factor restriction, and these tests are general enough

to be robust against heterogeneity and cross section dependence. Westerlund (2007) cointegration test is appropriate for small-sample and it is possible to get reliable results. Also, this test has a power relative to other popular residual-based panel cointegration tests. The null hypothesis is tested by determining whether error correction is present for individual panel members and for the panel as a whole. If the null of no cointegration is rejected, then co-integration between the variables exists. Taking into account that all the variables are integrated of order 1, cointegration test assumes the following data generating process:

$$\Delta y_{it} = \delta_i' d_t + \alpha_i y_{i(t-1)} + \pi_i' x_{i(t-1)}$$
$$+ \sum_{j=1}^{m_i} \alpha_{ij} \Delta y_{i(t-j)} + \sum_{j=0}^{m_i} \phi_{ij} \Delta x_{i(t-j)} + \omega_{it}, \tag{4}$$

where $d_t = (1-t)'$ holds the deterministic components, δ_i' represents the associated vector of parameters, while α_i is the speed adjustment term. If $\alpha_i < 1$ then cointegration exists, while if $\alpha_i = 1$, there is no cointegration. After testing cointegration, evaluation of the long-run parameters is carried out with the help of the panel Dynamic Ordinary Least Square (DOLS) developed by Pedroni (2001). This approach allows greater flexibility in the case of presence of heterogeneous cointegration vectors. Kao and Chiang (2000) have emphasized that DOLS is less biased in respect to FMOLS while Pedroni (2000) has indicated that there is a lower degree of distortion in DOLS than in FMOLS. Dynamic OLS in the panel model can be shown in the following form:

$$y_{it} = \alpha_i + \beta x_{it} + \sum_{j=-p_i}^{p_i} \phi_{ij} \Delta x_{it-j} + \varepsilon_{it}, \tag{5}$$

where ϕ_{ij} represents the coefficients of the lead and lag differences, which accounts for possible serial correlation and endogeneity of the regressor(s), thus yielding unbiased estimates, while $\pm p_i$ is the number of lags and leads. DOLS generates unbiased estimates for cointegrating variables, even with endogenous regressors, which is very important feature of this procedure. To determine the direction of long-run causality and to examine short-run dynamics between the variables, the panel VECM model is used, that is, the residual from DOLS long-term relation will be included:

$$ec_{it} = y_{it} - [\widehat{\alpha_i} + \widehat{\beta_i} x_{it}] \tag{6}$$

TABLE 3 Results of the Panel Unit Root Test

Series	PESCADF (constant & trend)					
	Levels			First difference		
	t-bar test	cv5	cv1	t-bar test	cv5	cv1
$\ln(\text{GDP})_{it}$	−2.716	−2.880	−3.150	−3.912	−2.880	−3.150
$\ln(\text{HE})_{it}$	−2.477	−2.880	−3.150	−3.753	−2.880	−3.150
$\ln(\text{LE})_{it}$	−1.856	−2.880	−3.150	−4.497	−2.880	−3.150

NOTES cv5 and cv1 are critical value at 5 and 1%, respectively.

and error correction terms (ECT) is included in a simple panel VECM model as follows:

$$\begin{bmatrix} \Delta y_{it} \\ \Delta x_{it} \end{bmatrix} = \begin{bmatrix} c_{1i} \\ c_{2i} \end{bmatrix} + \sum_{j=1}^{k} \Gamma_{j=1} \begin{bmatrix} \Delta y_{it-j} \\ \Delta x_{it-j} \end{bmatrix} + \begin{bmatrix} \alpha_1 \\ \alpha_2 \end{bmatrix} ec_{it-1} + \begin{bmatrix} \varepsilon_{1it} \\ \varepsilon_{2it} \end{bmatrix}, \tag{7}$$

where c_{1i} and c_{2i} are fixed effects, ec_{it-1} represents an error or deviation from the equilibrium, while α_1 and α_2 represent the adjustment coefficients and show how dependent and independent variables react to deviations from the equilibrium relationship. Statistically significant result for ECT involves long-run causality, as well as the long-term endogeneity of the variables (Hall and Milne 1994). To determine the short-term causality, the coefficients standing with the independent variables will be used, noting that the independent variables will be displayed with an appropriate lag length. Also, both variables will be converted to a first difference, due to the assumption that they are stationary after converting into the first difference.

Empirical Results

The table 3 presents the results of the stationarity for the variables. Following the stationarity test (Pesaran 2007), the null hypothesis about the existence of unit root in all the variables in level cannot be rejected. After the variable conversion into the first difference, they became stationary (the null hypothesis about the unit root is rejected) and the obtained result is statistically significant.

The results of Pedroni panel cointegration test based on within dimension and between dimension PP and ADF statistic are reported in the table 4. In the table, $\ln(\text{GDP})_{it}$ is presented as a dependent variable. In such case, we consider $\ln(\text{HE})_{it}$ and $\ln(\text{LE})_{it}$ as independent variables. According to Pedroni (1999) test, the null hypothesis of no cointegration is

TABLE 4 Panel Co-Integration Tests, Series $\ln(\text{GDP})_{it}$, $\ln(\text{HE})_{it}$ $\ln(\text{LE})_{it}$

(1)	Test statistics	Statistic	Probability	Weighted stat.	Probability
(a)	Panel PP-statistics	−2.140	0.016**	−2.058	0.019**
	Panel ADF-statistics	−3.480	0.000*	−3.018	0.001*
(b)	Group PP-statistics	−2.104	0.018**	–	–
	Group ADF-statistics	−3.181	0.000*	–	–
(2)	Test statistics	Value	Z-value	Probability	
	Gt	−2.660	−3.227	0.001*	
	Ga	−6.359	−0.259	0.398	
	Pt	−4.279	−1.354	0.088***	
	Pa	−6.214	−2.005	0.023**	

NOTES (1) Pedroni (1999) cointegration test, null hypothesis: no cointegration; (2) Westerlund (2007) ECM cointegration test, null hypothesis: no cointegration; (a) within dimension; (b) between dimension. *, ** and *** refer to 1%, 5% and 10% of the test significance.

rejected by the panel PP statistic, panel ADF statistic, group PP statistic and group ADF statistic. In line with the statistically significant results, it can be said that there exists cointegration between variables. Also, the results of Pedroni cointegration test, when $\ln(\text{HE})_{it}$ is seen as a dependent variable, are reported in the table 5. We consider $\ln(\text{GDP})_{it}$ and $\ln(\text{LE})_{it}$ as independent variables. The same outcome, in terms of the statistical significance of the results, as in the first case, points to the existence of the cointegration between the variables. To check the robustness of Pedorni's cointegration results, we also employ Westerlund (2007) for both cases, and the results are shown in the table 4 and table 5. For testing the cointegration when $\ln(\text{GDP})_{it}$ is considered as a dependent variable, the null hypothesis of no cointegration was rejected by 3 (out of 4) statistics of Westerlund (2007). In the specification when $\ln(\text{HE})_{it}$ is considered as a dependent variable, 3 among 4 statistics of Westerlund (2007) were found to be statistically significant.

For assessment of the long-run effects of economic growth on health expenditures and vice versa, DOLS method is used. As in the case of cointegration testing between the variables, two cases are also examined here. Table 6 contains the estimation results of long-run relationship among the economic growth, health expenditure and life expectancy. Firstly, the economic growth is considered as a dependent variable. It is evident that there is a positive and statistically significant relationship between the

TABLE 5   Panel Co-Integration Tests, Series $\ln(\text{HE})_{it}$, $\ln(\text{GDP})_{it}$, $\ln(\text{LE})_{it}$

(1)	Test statistics	Statistic	Probability	Weighted stat.	Probability
(a)	Panel PP-statistics	−1.822	0.034**	−2.369	0.009*
	Panel ADF-statistics	−2.673	0.004*	−3.035	0.001*
(b)	Group PP-statistics	−2.575	0.005*	–	–
	Group ADF-statistics	−3.319	0.000*	–	–
(2)	Test statistics	Value	Z-value	Probability	
	Gt	−2.498	−2.818	0.002*	
	Ga	−5.118	0.342	0.634	
	Pt	−6.031	−2.673	0.004*	
	Pa	−5.544	−1.644	0.050**	

NOTES   (1) Pedroni (1999) cointegration test, null hypothesis: no cointegration; (2) Westerlund (2007) ECM cointegration test, null hypothesis: no cointegration; (a) within dimension; (b) between dimension. *, ** and *** refer to 1%, 5% and 10% of the test significance.

economic growth and health expenditure. The income elasticity coefficient, in respect to health expenditure, varies from 0.371 to 0.498. In fact, this result can be justified by the observation that the economic growth of the SEEHN countries depends largely on the investments in health care (human capital). Furthermore, in case when the economic growth is a dependent variable, the coefficient which stands for life expectancy is 1.863 which means that health improvement has a significant influence on the economic growth. This result is in agreement with theoretical views that increased investments in healthcare prolong the anticipated life expectancy of people, which ultimately affects the economic growth.

And in the second case, when the health expenditure is a dependent variable, the positive long-run statistically significant relation between the health expenditures and economic growth is also evident. This result can be explained by the fact that with the accomplishment of the economic activity in the SEEHN countries, more funds will be available to public and private institutions, which will enable the increase of the share of resources that is allocated to the health sector. In the present case, the elasticity coefficient of health expenditure with respect to income varies from 1.014 to 1.573. The Wald test was observed to be significant in two (out of three cases), which means that the elasticity coefficient is greater than unity. Thus, the health expenditure in the SEEHN countries can be argued as a luxury good. Since this is a test on the sample of 7 countries,

TABLE 6   Dynamic Ordinary Squares Least Estimator Results

Dep. var.	Variable	Pooled		Weighted		Grouped	
$\ln(\text{GDP})_{it}$	$\ln(\text{HE})_{it}$	0.435*	(9.444)	0.371*	(9.357)	0.498*	(5.222)
	$\ln(\text{LE})_{it}$	−0.032	(−0.028)	1.863**	(0.040)	−0.933	(−0.504)
$\ln(\text{HE})_{it}$	$\ln(\text{GDP})_{it}$	1.573*	(8.635)	1.344*	(7.477)	1.014*	(3.907)
	$\ln(\text{LE})_{it}$	7.191*	(3.532)	8.797*	(4.140)	11.319*	(3.314)
Wald test†	*t*-statistic	3.147*		1.914**		0.053	
	χ^2 statistic	9.904*		3.663**		0.003	

NOTES   †Ho: Coefficient of $\ln(\text{GDP})_{it}$ is not greater than unity (equal to one). * Significant at 1% levels. ** Significant at 5% levels. *t*-statistics are reported in parentheses.

the reassessment of DOLS regression is made, in the way that in each of the subsequent evaluation one country was excluded, and the previously excluded was returned. Strong impact of economic growth on the health expenditure is not a result of outliers. The obtained values of coefficients, as well as the corresponding values of *t*-statistics are shown in table 7. When the panel pooled is the estimation method, the coefficients are statistically significant in all seven situations, and they range from 1.178 (when Croatia is excluded) to 1.857 (when Bulgaria is excluded). In the second case, when panel weighted is the estimation method, the results vary from 1.1 (when Croatia is excluded) to 1.527 (when Bulgaria is excluded). As it can be seen, the obtained coefficients are always statistically significant and greater than unity. Such results indicate that health care is a luxury good, and this is not the result of possible outliers.

Table 8 presents results of VECM model. The *t*-statistic for error correction term when the economic growth is a dependent variable indicates that the null hypothesis can't be rejected at the 5-percent level. On the other hand, when the health expenditure is considered as a dependent variable, the *t*-statistic for error correction term indicates that the null hypothesis can be rejected at the 1-percent level. From this, it can be concluded that the statistical long-run causality is unidirectional, and it runs from the economic growth to health expenditure. Also, in the short-run, there is one-way causality between the health expenditure and economic growth, and it runs from the economic growth to health. Elasticity of the health expenditure with respect to the income is 0.419. In other words, 1% of increase in the economic growth increases the health expenditures for 0.419 percent. In contrast to the long-term results, health care is a necessary product and not a luxury. The results suggest that there exists a pos-

TABLE 7   Dynamic Ordinary Least Square Regression When One Country Is Excluded from the Analysis

Excluded	(1)	(2)	(3)	(4)
Romania	1.515	10.072	1.347	8.247
Moldova	1.526	7.998	1.236	6.910
FYR Macedonia	1.620	8.844	1.401	7.567
Croatia	1.178	6.271	1.100	7.167
B&H	1.606	8.027	1.513	6.938
Bulgaria	1.857	7.594	1.527	6.252
Albania	1.634	8.517	1.496	7.915

NOTES   Column headings are as follows: (1) coefficients on health expenditure (pooled), (2) t-statistics of the coefficients, (3) coefficients on health expenditure (weighted), (4) t-statistics of the coefficients.

TABLE 8   Panel Vector Error Correction Model: Long Run Causality and Short Run Dynamics

Independent variables	Dependent variables			
	$\Delta\ln(\text{GDP})_{it}$		$\Delta\ln(\text{HE})_{it}$	
ec_{it-1}	−0.011	(−1.097)	0.059*	(2.920)
$\Delta\ln(\text{GDP})_{it-1}$	0.329*	(5.399)	0.419*	(3.270)
$\Delta\ln(\text{HE})_{it-1}$	0.029	(0.708)	−0.093	(−1.084)
$\Delta\ln(\text{LE})_{it-1}$	1.353	(1.416)	−1.126	(−0.561)
Constant	0.016*	(2.951)	0.061*	(5.479)
	$R^2 = 0.347$; DW = 2.152		$R^2 = 0.128$; DW = 1.784	

NOTES   * indicates significance at the 1% level. t-statistics are reported in parentheses.

itive relationship between the health expenditure and economic growth in the long and short run. Furthermore, we also observed unidirectional causality between the health expenditure and economic growth.

Conclusion and Policy Implications

This paper employs the panel data econometrics to investigate a link between the health expenditure and economic growth in the SEEHN countries. Although many studies have recently been used conducted on the health care spending-economic growth nexus, there is no study that has investigated this relationship in SEHHN. Thus, this paper intends to fill the gap in the empirical literature in this tradition. Recently, these countries have invested a lot of efforts to improve the health care policy. Pol-

icy makers started to consider the growth of economic activity as an appropriate tool which can generate improvements in health expenditures. Also health, as a part of human capital, has been recognized as one of the key drivers of economic growth.

The three main outcomes could be summarized as follows. First, there is co-integration among the economic growth, health expenditures and life expectancy. This suggests that there is a long-run relationship between the economic growth and health expenditure which is in accordance with the hypothesis number one. Second, in the long run, health expenditures cause positive changes in the economic growth. This result is in line with the second hypothesis. The third outcome is that in the long run, elasticity of the health expenditure with respect to the income is greater than unity. Therefore, health care can be considered as a luxury good. It can be pointed out that this finding is not the result of possible outliers. Nevertheless, in the short run, elasticity of the health expenditure with respect to income is less than unit, which means that health care is a necessary product. The third premise of the study is confirmed by a positive effect of the economic growth to health expenditure in the long and short-run.

Finally, on the basis of these outcomes, it is possible to suggest policy implications for these countries. It is essential for policymakers to formulate a long-run oriented policy, which will be directed towards the targeted increase of investment in health care, in order to increase the overall economic activity. It is necessary to strengthen the delivery of high-quality health promoting services at all levels of care. Also, it is of great importance to harmonize the cross border public health legislation and enable a Free Trade Area from the public health perspective. Strengthening of the institutions and improving of inter-sectoral governance of the health sector at all levels, including health information infrastructure and regional cross-border information exchange, present very specific goals for these countries.

Since the empirical results confirmed that health is a good that is necessary for life in the short-run, an important role for this sector should be performed by the government. In contrast to the short-run, the long-run result implies that consumers' preferences drive the health expenditure above the economic growth. This suggests that public financing should play a subsidiary role. Consequently, the adequate combination of public and private financing will be needed to improve the health care policy in order to ensure that the SEEHN countries can benefit from the growth.

These countries are lagging behind in the level of the income per capita, compared to the EU average. Due to the positive and statistically significant impact of the economic growth on health expenditure, it can be concluded, that shocks that have a negative impact on the economic growth to a large extent affect reduction of the health expenditure, too. For this reason, it is necessary for these countries to achieve a higher income in order to increase the investment in health care.

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Discovering Chinese Product Strategies on Stimulating Attitude and Intention: Involvement of Innovation, Country-of-Origin and Knowledge

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Globalization has succeeded in broadening consumers' choice via technological assistance which provides sufficient variety of information. Companies shall face competition, both at domestic and international level, which is more intensified than prior to globalization. Chinese brands are increasingly popular overseas and reaching out to compete with other global brands. Global consumers are also continuously looking up for newest product innovations yet having the lowest price tag in the market. Their search brings about knowledge and attention on Chinese brands. This research aims to analyse the influence of product innovation, country of origin, and product knowledge on purchase intention through brand attitude. To collect data, close-ended questionnaires were handed over to 100 respondents. The data were then calculated using SmartPLS 3.2.7. The findings indicated that in order to create more favourable brand attitude, a company needs to focus on efforts to generate customer memory about product specification.

Introduction

Wide expansion of international markets for consumer goods resulted from globalization affects companies' approaches toward modern cus-

tomers. A recent phenomenon shows that Chinese firms are no longer focusing on domestic market and going 'global.' Current researchers found that there are many underlying motives for Chinese firms to go global, in which 'creating a single and globally recognized brand' is one (Fetscherin and Sardy 2008; Fan 2006). Constantly, global firms remain focused on managing sales volume and brand equity by offering customers some values and beliefs which can stimulate purchase intention. One of the newly emerging concepts in business literature is brand attitude (Ghorban 2012). Some researchers pointed out that brand attitude is formed to achieve an ultimate goal of creating consumers' purchase intention (Sicilia, Ruiz, and Reynolds 2006). Prior research empirically investigated the concept and demonstrated a significant, positive relationship between attitude and purchase intentions of consumers (Sheeraz et al. 2016; Chan et al. 2013). Globalization is highly related to advancement of technology in business sector. Product innovation refers to an adoption of a new or significantly improved production method (Seng and Ping 2016). It is conducted to maintain a sustainable competitive advantage. Hence, product innovation has a considerable influence on attitudes and purchase intention of potential consumers.

Expansion of international market affects consumers' perspectives toward a product's country of origin. Consumers tend to possess their own perception towards country of origin. Along with progression of information, consumers' attitudes to domestic and foreign products are gradually shifting. The products of developing countries are not perceived to have good quality and negative attitudes toward these products are studied by (Schooler 1965). This study discusses consumers' views towards Chinese products. In contrast, other studies found that the more global the brand is, the better quality it is offered; hence, it receives more favourable attitude (Holt et al. 2004).

Various information and choice are currently available one click away from customers. It is a particularly important source of information for customers because they rely on product information to lower possible dissatisfaction or perceived risk (Olson and Jacoby 1972). In a recent study, Cakici and Shukla (2017) pointed out that consumers' product knowledge has a significant effect on their purchase intention. Attitudes also acted as a mediator for the relationship between product knowledge and purchase intention (Juharsah and Hartini 2014). Currently, some new brands entering global market are mostly from China and those brands are demanded by consumers. Lack of production of domestic product

and product necessity factors as well contributes to shape different consumer attitudes towards certain foreign products (Ramadania, Gunawan, and Rustam 2015) For instance, Xiaomi's action camera succeeds in penetrating new market and creating favourable brand attitude, which in turn, generate purchase intention. Emerging demands for action cameras in Indonesia remain strong, due to rising trends of travelling. In addition, some Indonesian consumers usually capture every moment to be uploaded to social media. This consumer behaviour phenomenon is seen as a promising opportunity. Some previous studies (Seng and Ping 2016; Juharsah and Hartini 2014) solely examined the relationship between attitude and purchase intention without any mediation from brand attitude. Past literatures did not incorporate product innovation, country of origin, and product knowledge into one conceptual model.

Literature Review

Product Innovation. Product innovations refers to cross-functional activities within a company. In order to create a successful innovation process, marketing effort needs to be integrated with R&D, manufacturing, and finance (Mohr and Sarin 2009). Technical and management systems within an organization shall simultaneously innovate to discover new or distinctive market offerings. When an innovation succeeds, it brings a superior value to the organization.

Country of Origin (COO). Anwar et al. (2013) stated that COO is described as different brands belong to the different countries. The brands belong to a certain country can be included into country-of-origin. Consumers form their expectations based on the perceived image of the country. The impact of COO also known from 'made in' will probably affect consumer attitudes and purchase intentions toward foreign and domestic product is most often developed study in the field of international marketing (Ramadania, Gunawan, and Jamaliah 2013; Amine 2008).

Product Knowledge. Lin and Zhen (2005) asserted that product knowledge is generated from awareness or understanding about the product, and also reflects consumers' confidence about it. In other words, Beatty and Smith (1987) referred to product knowledge as a consumer's perception toward certain products, including their previous experience of using the product. Consumers construct various product knowledge structure based on various degrees of familiarity toward a product (Park and

Lessig 1981). Those with higher product knowledge tend not to employ preconceived idea to judge product quality.

Brand Attitude. Brand attitude is a needed communication effects if brand purchase is to occur (Percy and Rossiter 1992). It refers to one-dimensional consumer attitude as a sum of evaluations on a product, which may be effective to examine attitude as a multidimensional construct consisting of a network of interconnected beliefs and evaluations (Bagozzi and Silk 1983).

Consumer Purchase Intention. Purchase intention is a decision-making process which studies the reason to buy a particular brand by a consumer (Shah et al. 2012). Hellier et al. (2003) believed that behaviour intention is the judgment or opinion about repurchasing a particular product from the same enterprise under the current premise and possible conditions of an individual. Behaviour intention is a subjective tendency for consumers to purchase their targeted product.

HYPOTHESIS DEVELOPMENT

Consumer purchase intention is frequently cited by marketing strategists as an advice about new progress and/or existing product decision. It can be simplified using 'likelihood of buying' and 'product recommendation.' A company may propose some strategies to influence consumers' judgement toward their brand or product. Previous literatures explained that novelty-seekers consumers tend to have more favourable attitudes toward acquiring innovative products (Manning, Bearden, and Madden 1995). This attitude influences intention and behaviour through its effects on attitude (Ajzen and Fishbein 2005). COO is a factor considered by consumers on purchase decision making (Lee 2013). Somansundaram (1993) argued that consumers with high level of product knowledge also form extreme beliefs and attitudes toward a company or its products. Hence, it is concluded that product knowledge affects purchase intention (Lin and Lin 2007). A positive attitude toward a brand allows consumers to decide on their purchase; while negative brand attitude obstructs consumers in making purchases (Cheng and Chang 2008).

From figure 1, the formulated hypotheses are depicted besides the arrows in the conceptual framework. Scholars believed that product innovation is one of the consideration factors affecting consumers to make purchase decision (Boyd and Charlotte 1999). It also shows that product innovation plays important role in determining potential consumers'
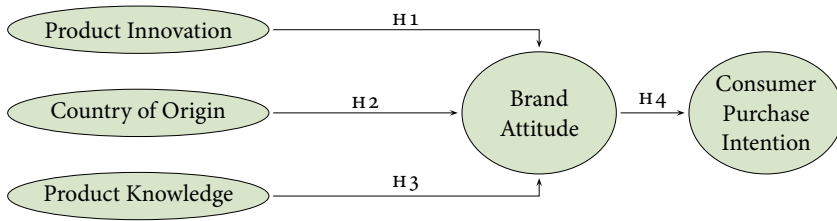
FIGURE 1   Research Hypothesis

purchase and attitude. Novelty-seekers consumers tend to have more favourable attitudes toward acquiring innovative products (Manning, Bearden, and Madden 1995). Therefore, the first hypothesis is formulated, as follows:

H1 *Product innovation has significantly influence with brand attitude.*

If the product comes from highly reputable country, most consumers have positive attitudes toward it. A person seems to hold a distinct and specific opinion about various aspects of a product or brand which later affects their intention to buy (Oh and Jeong, 2015). On the other hand, if the product comes from non-reputable country, consumers possibly forms negative attitudes (Bhakar and Bhakar 2013). Based on such theoretical support, the second hypothesis is formulated:

H2 *Country of origin has significantly influence with brand attitude.*

Lin and Chen (2006) highlighted that product knowledge is positively related and significantly influences consumers' purchasing decisions. However, through attitude as mediation variable, product knowledge significantly affects purchase intention (Juharsah and Hartini 2014). Consumers show their affections distinctively for a brand based on their own personal knowledge. A possible explanation for this different behaviour lies in the fact that novices lack in the necessary knowledge and experience to distinguish important product attributes (Beattie 1982). Hence, it is concluded that:

H3 *Product knowledge has significantly influence with brand attitude.*

A brand can fulfil multiple roles to influence consumers' decision-making process or choice behaviour (Sheeraz et al. 2016). Commonly, consumers' attitudes strongly influence their purchase behaviours (Taute et al. 2017; Priester et al. 2004). Positive attitude toward a brand allows consumers to make purchases; while negative brand attitudes obstruct

consumers in making purchases (Cheng and Chang 2008). Thus, the fourth hypothesis is:

H4 *Brand attitudes significantly influence with consumer purchase intention.*

Research Methodology

The primary data in this study were obtained from online and printed questionnaires. The raw data were subsequently proceeded using SmartPLS 3.2.7 for Windows to determine the frequency of responds from the respondents. Likert scale was employed to measure research variables in which the respondents were asked to indicate a degree of agreement and disagreement about the variables and ranged between 1–5, from very low to very high (Suwatno 2007). Research population was classified as infinite; hence, as the sample, this research used purposive sampling which was determined after the samples fulfilled certain criterion. Hair et al. (2010) stated that minimum sample size shall be 100–150 to ensure stable Maximum Likelihood Estimation (MLE). Total sample in this research was 100 respondents who were identified as potential Chinese brands consumers.

PLS began with testing measurement model to test the validity of constructs and reliability of instruments. Validity test in PLS was implemented through convergent validity test, discriminant validity test, and average variance extracted (AVE) test. Furthermore, reliability test was used to measure the consistency of items in measuring the variables. It can also be used to measure respondents' consistency in answering instruments. Overall, the response rate for online survey was higher than paper survey in this research.

Data Analysis and Results

There were some specific characteristics of the respondents for this study, including gender, education, age, revenue, and occupation. The total number of female respondents were as many as 54 females (54%). Most respondents (66% or 66 people), who were interested in Chinese brands, were freshman undergraduate students. Those below 31 years old were estimated to be accounted for 95% of the total respondents. It was also observed that most respondents earned less than IDR 3 million for their monthly incomes (78% of total respondents). Majority (70%) respondents were college students. Table 2 illustrates summary of characteristics of respondents.

TABLE 1 Measurement of Constructs

Variable	Indicator	Item
Product Innovation (x1), adapted from Damanpour (1999).	Technological innovation	The products regularly update its production technology.
	Service innovation	The products instantly update the service through Internet.
	New products	The products often lead ahead of other brands in launching new products.
	Market breakthrough	The products readily update its functions to meet consumer's needs.
Country of Origin (x2), adapted from Yasin, Noor, and Mohamad (2007).	Innovation of the country in production	I am sure that Chinese product have great innovation.
	The level of technological progress of the country of origin	I look for the label 'Made in China' to ensure that I buy products with newest technology.
	Production design	I look for product from China to ensure that the camera that I will purchase have good design.
	Productive creativity	I believe China have variety of products to choose.
	Production quality	I am seeking for Chinese product to ensure that I buy good quality product.
	The prestige of the home country of the brand	I believe that Chinese product determining the brand prestige.
	The image of the home country of the brand as developed country	I believe product from China determining country image that I perceived.

Continued on the next page

By continue making progress in innovation and new approach toward mid-range market, Chinese firms have been tremendously successful in recent years. Most respondents admittedly agree that Chinese brands regularly upgraded all types of electronic devices, which were also seen as attempts to survive in market competition. The result affirmed that country of origin served as an information cue prior to product purchasing. Country of origin or consumers' attitude towards products' origin can be influenced by cultural values and perceptual stereotypes. Product knowledge was associated with information and experience which built a memory of a product. Gathering information was not a big deal for customers in the Internet era. Relatively, Chinese brands were perceived in a posi-

TABLE 1 *Continued from the previous page*

Variable	Indicator	Item
Product Knowledge (x3), adapted from Brucks (1985) and Lin and Chen (2006).	Knowledge about the product	I feel knowledgeable about the products.
	Willingness to understand	I want to understand the products actively.
	Memory of product information	I actually stored in my memory about the products' information.
	Differentiation of product and brand	I am able to tell the differences of the products and other brand of product firms.
Brand Attitudes (Y1), adapted from Miniard et al. (1991).	Favourability	My attitude toward product' brand is favourable.
	Conation component	My attitude toward product' brand is positive.
	Affective component	I like product' brand.
	Cognition component	My overall evaluation of product' brand is good.
Consumer Purchase Intention (Y2), adapted from Barber et al. (2012).	Explorative interest	I intend to try the products.
	Referential interest	I would consider purchasing the products.
	Transactional interest	I plan on buying the products.
	Preferential interest	I am interested in using the products.

tive attitude from most respondents. Chinese brands themselves mostly widen their market share by offering a cheaper alternative for consumers who demanded for lower product price, compared to either Western or Eastern products. Furthermore, the data interpretation in this study included outer model, inner model, mediating effect, and *t*-statistics test result. The outer model in partial least square (PLS) specified the degree of validity and reliability of the relationships between latent variables and indicators. Firstly, convergent validity occurred when the construct measurements were correlated with one another. As a general rule of thumb, outer loadings should obtain the value of 0.70 or higher; while 0.5 AVE score was considered satisfactory (Avkiran 2018). Items with outer loadings of 0.6 might be considered acceptable, while items with outer loadings less than 0.5 should be eliminated from analysis (Ghozali 2008). The results of validity test are presented in table 3, including outer loadings and AVE scores.

TABLE 2   Characteristics of Respondents

Category	Item	f	%
Gender	Male	46	46
	Female	54	54
Education	Senior High School	66	66
	Diploma Degree	4	4
	Bachelor Degree	27	27
	Master Degree	2	2
	Doctoral Degree	1	1
Age	17–20 years old	26	26
	21–30 years old	69	69
	31–40 years old	3	3
	41–50 years old	1	1
	≥ 50 years old	1	1
Revenue	< Rp. 3.000.000	78	78
	> Rp. 3.000.000–7.500.000	17	17
	> Rp. 7.500.000–11.500.000	1	1
	> Rp. 11.500.000–15.500.000	2	2
	> Rp. 15.500.000	2	2
Occupation	College Student	70	70
	Civil Servant	2	2
	Private Employees	18	18
	Entrepreneur	4	4
	Housewife	1	1
	Unemployment	5	5

Invalid measurement could mystify the research objectives and data interpretations; hence, it should be removed to clearly investigate the correct measurement items and obtain desired results. Moreover, discriminant validity was an assessment to ensure that a reflective construct has the strongest relationship with its own indicators in PLS path model (Hair et al. 2017). The outer loadings and constructs were adequate yet valid, as illustrated in table 4.

Finally, reliability test is vitally important for both data stability and consistency. The measurement model with composite reliability above the threshold value of 0.70 for each construct was considered satisfactory.

TABLE 3   Convergent Validity Test

Construct	Measurement item	Loading	AVE
Product Innovation (x1)	PI1	0.893	0.680
	PI2	0.827	
	PI3	*	
	PI4	0.749	
Country of Origin (x2)	COO1	0.706	0.538
	COO2	0.740	
	COO3	0.756	
	COO4	0.700	
	COO5	0.765	
	COO6	*	
	COO7	*	
Product Knowledge (x3)	PK1	0.881	0.777
	PK2	0.866	
	PK3	0.896	
	PK4	*	
Brand Attitude (y1)	BA1	0.867	0.774
	BA2	0.883	
	BA3	0.885	
	BA4	0.885	
Purchase Intention (y2)	CPI1	0.886	0.786
	CPI2	0.812	
	CPI3	0.907	
	CPI4	0.937	

NOTES   * Deleted due to low outer loading result.

The reliable statement item also required Cronbach Alpha value higher than 0.60 for all constructs (Abdillah and Hartono 2015). Reliability test results were summarized in table 5.

Based on the summaries in table 5, composite reliability values for all constructs fulfilled the requirement of 0.70. The results displayed that product innovation obtained 0.932; country of origin was 0.853; product knowledge recorded 0.86; brand attitude was 0.912; and purchase intention was recorded at 0.936. Thereby, high composite reliability values led to the consistency of Cronbach Alpha scores for all constructs. Thus, it

TABLE 4 Discriminant Validity Test

(1)	(2)	(3)	(4)	(5)	(6)
PI1	0.893	0.295	0.450	0.485	0.375
PI2	0.827	0.274	0.365	0.470	0.371
PI4	0.749	0.277	0.365	0.353	0.228
COO1	0.259	0.706	0.303	0.459	0.423
COO2	0.336	0.740	0.209	0.282	0.262
COO3	0.156	0.756	0.199	0.266	0.248
COO4	0.389	0.700	0.196	0.417	0.341
COO5	0.196	0.765	0.304	0.352	0.310
PK1	0.389	0.248	0.881	0.395	0.421
PK2	0.477	0.318	0.866	0.452	0.466
PK3	0.382	0.327	0.896	0.445	0.481
BA1	0.484	0.566	0.479	0.867	0.687
BA2	0.452	0.412	0.387	0.883	0.714
BA3	0.434	0.378	0.389	0.885	0.734
BA4	0.509	0.428	0.468	0.885	0.735
CPI1	0.339	0.455	0.513	0.745	0.886
CPI2	0.311	0.258	0.377	0.568	0.812
CPI3	0.392	0.402	0.491	0.751	0.902
CPI4	0.379	0.459	0.449	0.798	0.937

NOTES Column headings are as follows: (1) item, (2) Product Innovation, (3) Country of Origin, (4) Product Knowledge, (5) Brand Attitude, (6) Purchase Intention.

TABLE 5 Reliability Test

Variable	(1)	(2)	(3)	(4)
Product Innovation (x_1)	0.765	0.932	>0.70	Reliable
Country of Origin (x_2)	0.790	0.853	>0.70	Reliable
Product Knowledge (x_3)	0.856	0.864	>0.70	Reliable
Brand Attitude (y_1)	0.903	0.912	>0.70	Reliable
Purchase Intention (y_2)	0.909	0.936	>0.70	Reliable

NOTES Column headings are as follows: (1) Cronbach alpha, (2) composite reliability, (3) scale, (4) description.

confirmed the reliability of measurement items. Meanwhile, the structural model was also acknowledged as inner model. It emphasized on
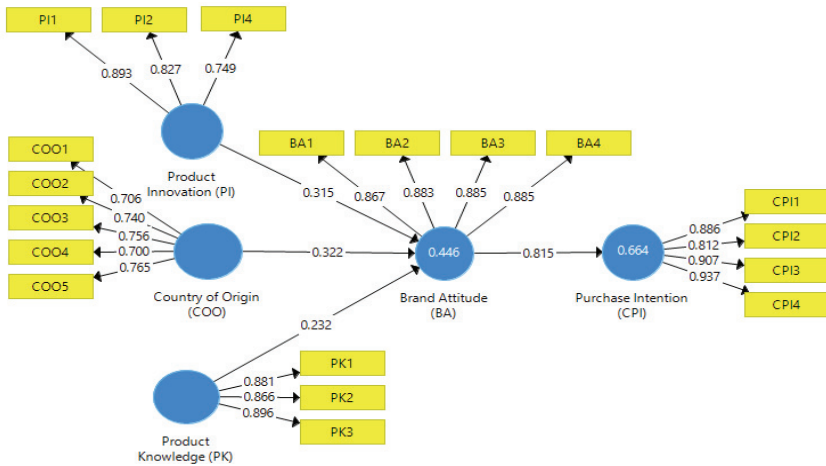
FIGURE 2 *R*-Square Test Result

the relationships between independent and dependent latent variables. Inner model evaluation consisted of *R*-square measurement and path coefficient results. The coefficient of determination (R^2) indicated the differing variance in endogenous latent variables from its independent latent variables. Conversely, if the results of R^2 was 0.67, 0.33, and 0.19, it proved that the models were subsequently 'good,' 'moderate,' and 'weak' (Ghozali 2008). Figure 2 contains the illustration of R^2 test results based on SmartPLS 3.2.7 calculations.

The total of 44.6% specified the proportion of variance in brand attitude which was explained by product innovation, country of origin, and product knowledge. *R*-square of 66.4% measured the ability of dependent latent variables (i.e. purchase intention) to explain the variances of independent latent variables. It was also proved that R^2 was statistically significant. After assessing the quality of outer model, it starting from an evaluation of structural results by measuring path coefficient (Sanchez 2013). Path coefficient test results offered theoretical measures of the relationship between constructs and indicators in structural model. The numbers on the arrows in bootstrapping output were called path coefficient. The weight of different path coefficients represented the rank of each variable's relative statistical importance (Wong 2013). All path coefficients for each construct were positive, as illustrated in figure 3.

A mediation could only occur when there was a causal effect between independent and dependent variables which is caused by an intervention or a mediating effect. Biehal, Stephens, and Curio (1992) examined an
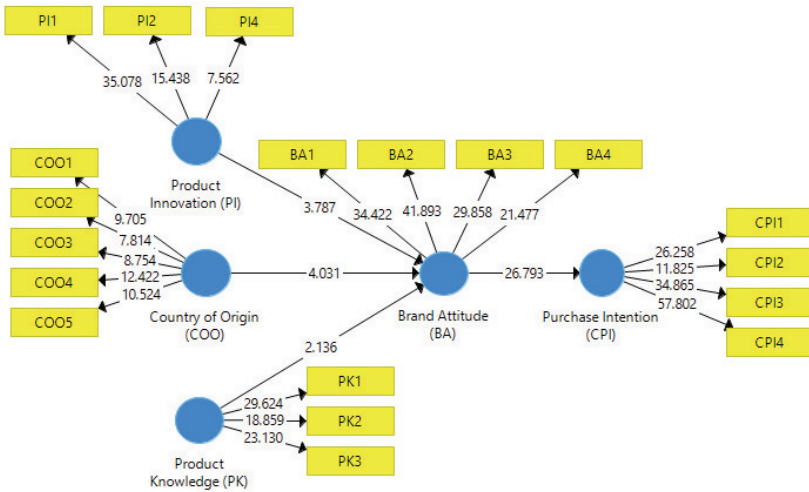
FIGURE 3 Bootstrapping Test
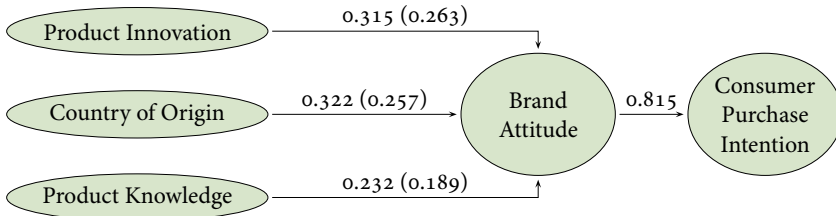
FIGURE 4 Mediating Effect (indirect effect in parentheses)

attitude toward a brand as a mediator toward purchase intention. In this study, the total indirect effects are illustrated in figure 4 and table 6.

Mediation test was to discover if a mediating construct can significantly carry the ability of an independent variable to a dependent variable (Ramayah, Lee, and In 2011). Generally, a mediator was a proportion of total direct effects of exposure on causal relationship, which was interpreted by an indirect effect. However, the total indirect effect and direct effect were both significant. If the direct path was significant, it implied that there was a mediating variable; hence, bootstrapping procedure shall be redone. If the indirect path was not significant after bootstrapping, there was no mediation. If it is significant, in order to examine the strength of mediating effect, it was recommended to calculate variance accounted for (VAF) value in SmartPLS 3.2.7. According to Hair et al. (2014), a VAF value greater than 80% represented a full mediation, a

TABLE 6   Mediating Effect

Item	Indirect Effect	Total Effect	VAF
Product Innovation → Brand Attitude → Purchase Intention	0.263	0.578	45%*
Country of Origin → Brand Attitude → Purchase Intention	0.257	0.579	44%*
Product Knowledge → Brand Attitude → Purchase Intention	0.189	0.421	45%*

NOTES   * Partial mediation.

value between 20% and 80% indicated a partial mediation, and a value less than 20% meant no mediation. VAF was computed by dividing total indirect effect and total effect, then multiplied by 100. Meanwhile, the total effect itself was based on the sum of direct effect and indirect effect.

As illustrated above, table 6 implied that the relationships were all classified as partial mediations. James and Brett (1984) suggested that the model assumed it has partial mediation, i.e., the mediated path via M (e.g. brand attitude) is accounted for some effects of X (e.g. product innovation) on Y (e.g. purchase intention). Mediating effect's results presented in table 6 explained that all variables had mediating effects on their relationships with dependent variables and the range of VAF values were approximately 45%. It is important to recognize that hypothesis testing aimed to test some theoretical propositions. In the context of PLS-SEM, hypothesis testing was frequently conducted through the calculation of t-statistics or p-values for each hypothesis. The significance threshold for t-values was 1.96 for 95% confidence level (Hair et al. 2014). Hence, if the result of p-value is less than 0.05 or t-statistics is more than 1.96 (with $\alpha = 0.05$ or 5%), then it is assumed that alternative hypothesis was accepted. Table 7 summarizes the result of hypothesis testing in SmartPLS 3.2.7.

Table 7 presents the outputs of standardized path coefficient related to all variables. The hypotheses were accepted and had positive direct effects on related variables. New product development keeps companies growing. Chinese brands offered some different strategies to broaden their market by offering low-priced products and producing various product lines. This posit is supported by past literatures, which suggested that brand attitude was influenced by product innovation from specific brand names (Ouellet 2006). The overall relationship between product innovation and brand attitude was supported ($\beta = 0.315$; t-statistic = 3.787; $p = 0.000$); therefore, H1 is accepted. The perception about some products'

TABLE 7   Hypothesis Testing

Item	(1)	(2)	(3)	(4)	(5)	(6)
Product Innovation → Brand Attitude	0.315	0.317	0.083	3.787	0.000	H1*
Country of Origin → Brand Attitude	0.322	0.331	0.081	4.031	0.000	H2*
Product Knowledge → Brand Attitude	0.232	0.232	0.108	2.136	0.000	H3*
Brand Attitude → Purchase Intention	0.815	0.818	0.030	26.793	0.033	H4*

NOTES   Column headings are as follows: (1) original sample, (2) sample mean, (3) standard deviation, (4) *t*-statistics, (5) *p*-values, (6) description. * Accepted.

country of origin currently served as an important evaluation aspect for a certain brand. It is proved that different countries had their respective impression in consumers' minds. However, this study proved that products from developing country (i.e. China) gradually started to be perceived more positively by consumers. Over one hundred studies were conducted on country-of-origin information and its effect on consumers' attitudes toward certain products (Hsieh 2004). It was concluded that there was a significant relationship between country of origin and brand attitude (β = 0.322; *t*-statistic = 4.031; p = 0.000); thus, H2 is accepted.

The visibility of products knowledge on the media also aimed to provide information and recommendation to consumers. However, Chinese product knowledge may not play an important role in consumer pre-purchase evaluation. Despite low *t*-statistics score compared to other independent latent variables, product knowledge still yielded significant relationship toward brand attitude. It is believed that there is a correlation between product knowledge and consumer beliefs and attitudes towards a company or its products (Somansundaram 1993). The result indicated that product knowledge had a significant, positive relationship with brand attitude (β = 0.232; *t*-statistic = 2.136; p = 0.000); hence, H3 is accepted. Brand attitude was related to consumers' purchase intention and company's financial performance, because a brand was a valuable asset for a company. Low price and rapid innovation are Chinese brand's business plan. Market response was very favourable, because consumers have more flexibility in choosing products. More favourable attitude toward a certain behaviour could strengthen individual intention to perform the behaviour itself (Ajzen 1991). A significant, positive relationship between

brand attitude and purchase intention was supported ($\beta = 0.815$; t-statistic $= 26.793$; $p = 0.033$); therefore, H4 is accepted.

Conclusion

Level of acceptance for Chinese brands is progressively growing in the recent market. As the brands offer better quality, cheaper price, good brand attitude, various products line, and advance innovation, they manage to enhance their popularity among international consumers. Product innovation adds more customers value, product origin extends positive brand attitude, and product knowledge is improved among consumers; thus, they all directly and indirectly influence purchase intention of Chinese brands. Since product knowledge has the lowest significance towards brand attitude and purchase intention, a company needs to focus on efforts to generate consumers' memory about product specifications. Promotion efforts through advertising and public relation are recommended because there are still few advertisements related to Chinese products which enhance product knowledge.

Limitations

This research also has some limitations. Firstly, it has geographical limitation. Secondly, it only has a small number of samples. Thirdly, few theoretical supports provide some limited space to explore this topic. Future studies can add more variables and implement this topic for different products. A comparison between two different lines of product is strongly recommended. As country of origin is one of the most significant variables in this research; hence, future research can compare different countries of origins. Further research can add more variables to determine causal relationship between brand attitude and purchase intention.

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Macroeconomic Implications of Exchange Rate Depreciation: The Nigerian Experience

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This study examines the macroeconomic implications of exchange rate depreciation in Nigeria. It employs the Autoregressive Distributed Lag Bounds Testing Cointegration approach for data covering the period of 1970 to 2015. Empirical results confirm that the Naira depreciation positively and significantly impact all the indicators of macroeconomic performance except for output per capita, which is found to be insignificant. This implies that Naira depreciation stimulates trade balance; promotes price instability and increases the interest rate. Thus, currency depreciation does not benefit the country's economy. Moreover, the study confirms that long-run relationship exists between exchange rate depreciation and macroeconomic performance in Nigeria. Thus, there is the need for trade and export diversification to sustain gains from exchange rate movements and mitigate its negative effects on the economy.

Introduction

Exchange rate variations bring changes to trade balance and thus cause both price and output level of an economy to witness significant changes (Kandil 2004; Kollmann 2005; Mamun, Chowdhury, and Basher 2013; Cheung and Sengupta 2013). Nigeria's foreign sector is seriously affected by the depreciation of the naira against other major currencies of the world. Such has serious implication for Nigeria's macroeconomic performance. According to Ike (1984), Nigeria first witnessed depreciation in its

currency by 10% in 1973 in response to the US currency depreciation the same year by the same amount. This made the country's foreign exchange reserves to grow by 773.5% in 1974. Consequently, the effect of currency depreciation in the foregoing year was meagre in enhancing the foreign exchange asset position of the Nation as foreign exchange reserves fell by about 2.5%. In 1974, it was observed that many other factors, like the increased oil export caused by the 1973 Arab–Israeli war and the increased oil price negotiated by the Organisation of Petroleum Exporting Countries (OPEC), contributed to the growth of Nigeria's foreign exchange reserves. More so, in November 2014, Nigeria depreciated its currency again by 28 per cent, from N155 to a dollar to N197, on the advice of the International Monetary Fund (IMF).

Exchange rate variations affect the economy via its exports channel in two ways – its depreciation and its volatility or risk (Fang, Lai, and Miller 2005). Both effects, have received considerable attention since fixed exchange rates system collapsed in the early 1970s. Depreciation has the tendency to lower the foreign currency price of exports, and perhaps boosts exports volume as well as export revenue in the home country. Export revenue can fall under certain conditions, like for instance; a very high inelastic foreign import demand translates to falling export revenue. According to Fang, Lai, and Miller (2005), it becomes ambiguous if export production incorporates high import content. This is because the domestic price of exports always rises with currency depreciation (Matsuyama, Kiyotaki, and Matsui 1993). Exchange from a hard or foreign currency to a local currency can result in either pass-through foreign exchange loss or gain. Realization of gains or losses depends on the appreciation or the depreciation of the local currency against respective hard currencies comparative to the date of the transaction that gave rise to earning of the hard currencies (Cherop and Changwony 2014).

Flexible, but stable exchange rates are critical to national and global economic well-being (Beckington and Amon 2011). Systematic exchange arrangements have the tendency to support and facilitate trade in goods and services and at the same time boost investments across national boundaries in a balanced and sustainable manner (Fang, Lai, and Miller 2005; Beckington and Amon 2011; Mengistu and Lee 2014). The essential logic behind these precepts is flawless, but accomplishing and maintaining such flexibility, stability, and order are hampered when national governments ignore these practical axioms for self-serving, short-sighted, and mercantilist reasons (Beckington and Amon 2011). In the short-term,

a country's enforced undervaluation of its currency can be expected to boost its jobs, output, exports, and foreign reserves, while reducing imports and syphoning foreign direct investment along with research and development from other countries (Beckington and Amon 2011). Such 'beggar-thy-neighbour' gains, however, are contrary to the basic international goal of achieving efficient markets for the general welfare. They further run the risk of prompting other countries to misalign their own currencies in self-defence. At that point, the situation can deteriorate very quickly into destructively pervasive economic stagnation and worsen economic performance (Beckington and Amon 2011).

Theoretically, currency depreciation enhances economic performance as it allows domestic output level to rise promoting spending for home products (Mamun, Chowdhury, and Basher 2013). This is because it increases the competitiveness of exported goods in the international markets (Mengistu and Lee 2013; Nyeadi, Atiga, and Atogenzoya 2014). Conversely, it causes a higher level of import price, thereby engendering inflationary pressures especially in countries, like Nigeria, that is import dependent. Empirically, there is the ambiguity of evidence as to the type of effect exchange rate depreciation has on trade. Studies by Junz and Rhomberg (1973) and Wilson and Takacs (1979) suggested that devaluation enhances exports for developed economies that operate fixed exchange rates system, while Bahmani-Oskooee and Kara (2003) observed similar results for countries operating flexible exchange rates. However, Athukorala (1991), Athukorala and Menon (1994), Abeysinghe and Yeok (1998), Wilson and Tat (2001), and Fang, Lai, and Miller (2005) reported that depreciation does not improve export and trade performance of some Asian countries. Specifically, Fang, Lai, and Miller (2005) noted that exchange rate depreciation and exchange rate volatility generate a negative net effect on export growth and consequently adversely affects economic performance in the process.

Currency depreciation does not only weaken local firms' ability to transfer appropriate technology from foreign countries but also stalls industrial diversification in that it hurts agricultural export development. Currency depreciation has also been found to undermine the banks and hinders domestic ownership of private assets and economic performance (Fang, Lai, and Miller 2005; Fidelis 2014). The Marshal-Lerner condition states that depreciation brings a positive effect on trade when the sum of demand elasticities for exports and imports exceeds unity (Mengistu and Lee 2013). This means that depreciation improves trade balance if

the depreciating nation's demand elasticity for imports plus the foreign demand elasticity for the country's exports exceed one. If this is not the case, then, currency depreciation could lead to economic contraction (Mamun, Chowdhury, and Basher 2013).

Since Nigeria currently faces depreciation of her currency which has seen a dollar been exchanged for over ₦360 officially, it becomes crucial to conduct a study of this sort. Moreover, since Nigeria is an import dependent country and it only depends on primary exports, which is demand inelastic in the international market, a study of this nature becomes inevitable. To this end, this study attempts to proffer answers to several questions such as: what sort of impact does Nigeria's currency depreciation have on the country's GDP? Does currency depreciation have any significant effect on improving Nigeria's trade balance? How does currency depreciation affect domestic price level? Does currency depreciation have anything to do with the domestic interest rate in the country?

The present study is at variance with previous studies as it focuses on the channel through which exchange rate depreciation affects the macro economy of Nigeria. Consequently, the main thrust of the study is to examine the macroeconomic effect of exchange rate depreciation in Nigeria between 1970 and 2015.

The rest of the paper proceeds as follows: section two is on theoretical issues and review of past studies, section three presents analytical framework while section four focuses on data description and pre-estimation analyses. The fifth section presents the results and discussion of findings and section six conclude the paper.

Literature Review

THEORETICAL REVIEW

Interest Rate Parity (IRP) and Purchasing Power Parity (PPP)

The IRP states that the difference between interest rates in two countries is the difference between the future rate and the current rate of their currencies (Adrangi, Raffiee, and Shank 2007; Cherop and Changwony 2014; Lo and Morley 2015). The theory states that real interest rates should be equalized across countries under fully liberalized financial markets without government interventions and capital controls (Chang and Su 2015). If this parity is broken, then there is the existence of an arbitrage resulting in a risk-free return (Edison 1987). According to this theory, if an investor makes his own forecasts by using rational expectations and, at the same time, the international capital markets and the product markets are in-

tegrated well enough, then real interest rates must be equal across countries (Chang and Su 2015). PPP in its own sense is a theory of long term equilibrium exchange rates based on relative price levels of two countries (Cherop and Changwony 2014). According to He, Ranjbar, and Chang (2013), PPP remains a cornerstone of many theoretical models in international finance. The PPP states that the exchange rates between two currencies are in equilibrium when the purchasing power is the same in both countries. This implies that the exchange rate between any two countries should equal the ratio of the two currencies' price level of a fixed basket of goods and services. The basic idea behind the PPP hypothesis is that because any international goods market arbitrage should be traded away over time, we should expect the real exchange rate to return to a constant equilibrium value in the long run (He, Ranjbar, and Chang 2013). The concept is founded on the law of one price which states that in the absence of transaction costs, identical goods will have the same price in different markets (Cherop and Changwony 2014).

Exchange Rate Channel of Monetary Transmission

In recent empirical studies on monetary policy transmission, attention has been directed towards exchange rate channels of monetary transmission. This becomes very crucial as the exchange rate channel has a significant role to play in aggregate output fluctuations in an economy. The exchange rate channel plays an important role in how monetary policy affects the domestic performance of an economy (Taylor 1993; 1995; Mishkin 1996). The channel works through the interest rate effects. This is so because when real domestic interest rates decrease, domestic currency deposits (for instance, Naira) become less attractive to foreign investors relative to deposits that are foreign denominated (like US dollar), leading to a decline in the value of the domestic currency deposits relative to other foreign currency deposits (Mishkin 1996). This means a depreciation of the domestic currency relative to other foreign currencies and the implication of this on aggregate output is that it makes domestic goods produced in the country cheaper compared to foreign goods thereby making exports of domestic goods increase sharply relative to imports. Consequently, net exports rise, and aggregate domestic outputs rise as well.

EMPIRICAL REVIEW

There are series of studies on exchange rate, trade and output performance for developing countries, as well as, exchange rate and export per-

formance. Result wise, some studies agreed that exchange rate depreciation stimulate output growth and trade balance while others found negative results. For instance, Devarajan, Lewis, and Robinson (1993) observed that exchange rate depreciation enhanced economic performance. Cherop and Changwony (2014) opined that domestic currency depreciation stimulates economic activity through the initial increase in the price of foreign goods relative to the price at home. Hence, by increasing the international competitiveness of domestic industries, exchange rate depreciation diverts spending from foreign goods to domestic goods. Similar conclusions were arrived at in Guitian (1976), Dornbusch (1988), Beckington and Amon (2011), as well as, Mengistu and Lee (2014). For Frankel (1998), the success of currency depreciation in facilitating trade balance mainly depends on switching demand in the proper direction and on the capacity of the home economy to meet the additional demand by supplying more goods.

For cross-country studies, Fang, Lai, and Miller (2005) researched into export promotion through exchange rate policy in Indonesia, Thailand, Japan, Taiwan, Singapore, Philippines, Korea and Malaysia. It was affirmed that exchange rate movements affect exports through its depreciation and its variability (risk). Depreciation, as suggested, raises exports, but exchange rate risk could offset that positive effect. The net effect between both effects was investigated for the selected countries and result showed that depreciation enhanced export. Exchange rate risk contributed to export growth in Malaysia and the Philippines, leading to positive net effects. It also produced a negative effect for six of the countries, resulting in a negative net effect in Indonesia, Japan, Singapore, Taiwan and a zero-net effect in Korea and Thailand. Ali and Anwar (2011) examined the repercussions of induced currency depreciation in developing countries. The results presented were based on a model with firm microeconomic foundations and which takes into cognizance both the supply and demand-side effects of exchange rate variations. The distinctive feature of the model is the role of exchange rate expectations. The study considered three kinds of expectations; adaptive, extrapolative, and regressive expectations. Several sensitivity tests were also performed based on these expectations. Based on simulation, it was reported that the effect of induced currency depreciation largely depends on supply-side effects and that in most cases, currency depreciation results in a fall in output, a price increase and an improvement in the trade balance. The study reported that in the absence of weak supply-side effects of exchange rates, if

the Marshall-Lerner conditions hold, then home currency depreciation will have a favourable effect on output and a negative effect on trade balance.

Furthermore, Nouira, Plane, and Sekkat (2011) researched into exchange rate devaluation and manufactured export. It employed a sample of 52 developing countries, which has adopted proactive exchange rate policies and the results showed that between 1991 and 2005, several countries used undervaluation to foster the price competitiveness of manufactured exports. Mengistu and Lee (2014) investigated the effects of currency depreciation on the trade balance in selected fourteen Asian economies. The findings did not find any evidence for depreciation enhancing trade balance in the selected sample. However, when the study was narrowed down to eight relatively bigger, stable and more industrialised countries, depreciation enhanced trade balance. Hooy, Law, and Chan (2015) examined the impact of the real exchange rate on ASEAN disaggregated exports to China. First, the study found that income elasticity is positive and significant in all export categories and increases with higher technology products. Secondly, they found that the RMB real exchange rate significantly and positively enhanced ASEAN total exports to China. Thirdly, the RMB effect on disaggregated exports by technology level is mixed; for finished goods exports, higher technology exports were more sensitive to RMB depreciation, which is consistent with the income effect, while for parts and components exports, the lower technology exports had greater exposure to RMB depreciation, which is possibly due to the price effect and the recent production relocations of multinational corporations in the ASEAN region to China and Vietnam.

For country specific studies, Cheung and Sengupta (2013) looked at the effect of exchange rate movements on exports of Indian non-financial sector firms between 2000 and 2010. Results revealed that exports shares of Indian firms were negatively but significantly impacted by currency appreciation. The Indian firms with smaller export shares responded strongly to real exchange rate volatility, compared with those exporting goods. Also, firms that export services were more affected by exchange rate fluctuations. Similarly, Divakaran and Gireeshkumar (2014) focused on the Indian economy and found that a weak rupee made India produce more competitively in global markets, thereby stimulating the country's exports and output growth. More so, focusing on the same India, and using 36 currency trade-based effective nominal and real exchange rates and trade balance, Datta (2014) observed that increase of trade balance in

India is an important reason for currency depreciation. Mamun, Chowdhury, and Basher (2013) examined the effect of exchange rate variation on domestic output growth and price level of Bangladesh. Combining exchange rate and other traditional factors like investment, bank credit, narrow and broad money together with the labour force, the study observed that depreciation has an expansionary effect on output and price level. Li, Ma, and Xu (2015) focused on the exchange rate and export in China by proving first-hand firm-level evidence on Chinese exporters' reaction to RMB exchange rate movements. It was reported that exporters with higher productivity price responded more to exchange rate movements. Furthermore, RMB appreciation reduced the probability of entry as well as the probability of continuing in the export market. Paudel and Burke (2015) extended the study to Nepal between 1980 and 2010. Employing a gravity modelling approach, it confirmed that real exchange rate appreciation influenced Nepal's export.

For some notable African studies, Nyeadi, Atiga, and Atogenzoya (2014) analysed the impact of exchange rate movement on export growth in Ghana from 1990 to 2012. The study observed that exchange rate has no impact on Ghana's export but that output, national saving, import growth and total investment significantly impact export. Cherop and Changwony (2014) conducted a survey on exchange rate fluctuation and tea export earnings among smallholder tea factories in Kenya using correlation analysis. Results found a positive relationship between exchange rate and per kilogram of green leaf paid. It also observed positive correlation between exchange rate and quantities of tea sold. Extending the study to Nigeria, Loto (2011) adopted the elasticity approach to the balance of payment adjustment. The result showed that depreciation did not improve trade balance and that Marshal-Lerner condition did not hold for Nigeria. Ogbonna (2011) tested the Marshall-Lerner (ML) condition for Nigeria using data between 1970 and 2005. The study found no long run relationship between trade balance and real exchange rate but confirmed that Marshall-Learner (ML) condition holds and that depreciation enhanced trade balance in the country. Ogundipe and Egbetokun (2013) employed data covering 1970 to 2010 and found that exchange rate induced an inelastic and significant impact on the trade balance in the long run while no causality was found in the short run. Umoru and Oseme (2013) explored the J-curve effect in studying trade flows and exchange rate shocks in Nigeria. The study did not find any empirical evidence in favour of the short-run deterioration of the trade balance as implied by

the J-curve hypothesis but found evidence for the cyclical trade effect of exchange rate shocks. Adediran, Yusuf, and Adeyemi (2014) traced exchange rate fluctuation to output growth Nigeria between 1986 and 2013 and found that exchange rate depreciation positively but insignificantly impacted the GDP.

Considering the review so far, previous studies have beamed searchlight on the subject matter in several ways. Studies such as; Guitian (1976), Dornbusch (1988), Devarajan, Lewis, and Robinson (1993), Fang, Lai, and Miller (2005), Ali and Anwar (2011), Beckington and Amon, (2011), Mengistu and Lee (2014), as well as Cherop and Changwony (2014), have focused on the link between exchange rate and output growth. Others, like Cheung and Sengupta (2013), Datta (2014), Paudel and Burke (2015), and Hooy, Law, and Chan (2015), have focused on the nexus between exchange rate and trade balance or export. However, there is a dearth of studies focusing on the implications of exchange rate depreciation on macroeconomic performance. The present study aims to fill this noticeable gap in the literature.

Also, since there has been no consensus in the literature on the exact effect of exchange rate depreciation on variables like export, trade balance, and output growth, this study attempts to further deepen the discussion and take a position. Moreover, the recent happenings in Nigeria, where exchange rate movements have thrown the country into recession, and the fact that studies like; Loto (2011), Ogbonna (2011), Ogundipe and Egbetokun (2013), Umoru and Oseme (2013), and Adediran, Yusuf, and Adeyemi (2014) did not account for exchange rate effect on macroeconomic indicators like the interest rate, provides justification for this study.

Analytical Framework

This empirical investigation looks at currency depreciation and macroeconomic performance in Nigeria over the period 1970–2015. Sequel to the literature review on exchange rate depreciation and following the work of Ali and Anwar (2011), the empirical model is specified thus:

$$\pi_1 = E_t\pi_{t+1} + b_1 y_t + b_2 p_t + b_3(p^f + e_t) + u_{1t}. \tag{1}$$

Equation (1) is derived by making use of the New Keynesian Approach and it represents the supply side of the market. In equation (1), π_t is the inflation rate, $E_t\pi_{t+1}$ is expected inflation rate, y_t is the current period output, p_t is the domestic price level, p^f is foreign price level, e_t is nominal

exchange rate, b_1, b_2 and b_3 are the slope parameters for output, domestic price level, and foreign price level respectively, and u_{1t} is the residual term. As affirmed in Ali and Anwar (2011), equation (1) is an expectations-augmented Philips curve for an open economy where the exchange rate is found to not only affects directly the domestic inflation rate but also its stabilizing properties (Froyen and Guender 2000; Ali and Anwar 2011). In equation (1), it is expected that exchange rate depreciation leads to higher inflation, while an appreciation leads to deflation in the home country.

On the supply-side, depreciating the home currency can cause unfavourable effects in the home economy (in the form of higher inflation and lower output). Alternatively, the model can be expanded by introducing exchange rate on the supply side as we have in Ball (1999), Froyen and Guender (2000), and Ali and Anwar (2010; 2011).

$$y_t = E_t y_{t+1} - a_1(r_t - r_t^f) + a_2(p_t^f + e_t) + u_{2t}. \tag{2}$$

Equation (2) is the IS curve known as expectational or inter-temporal IS equation showing that the demand for output in the current period depends on expected output. In equation (2), y_t is current period output, $E_t y_{t+1}$ is the expected output, $r_t - r_t^f$ is the interest rate differential, a_1 and a_2 are slope parameters for real interest rate and price level respectively, p_t^f is foreign price level, e_t is nominal exchange rate while u_{2t} is the residual term. A similar IS curve, with firmer micro economic foundations than the traditional IS curve, has been employed in Kerr and King (1996), McCallum and Nelson (1999) and Ali and Anwar (2011).

$$i_t = i^f + \bar{e}_{t+1} - e_t + u_{3t}. \tag{3}$$

Equation (3) is the interest parity condition. In equation (3), i_t is the nominal interest rate, i^f is the foreign interest rate, $\bar{e}_{t+1}$ is the expected nominal exchange rate, e_t is nominal exchange rate, and u_{3t} is the residual term. Interest parity states that due to arbitrage by risk neutral agents, the domestic interest rate will be equal to the foreign interest rate plus expected capital gains that are associated with holding wealth in foreign currency denominated assets.

$$r_t = i_t - E_t \pi_{t+1}. \tag{4}$$

Equation (4) is the real interest rate and it is defined as the nominal interest rate minus the expected inflation rate. In equation (4), r_t is the real interest rate, i_t is nominal interest rate, and $E_t \pi_{t+1}$ is expected inflation rate.

ESTIMATION TECHNIQUE

The ARDL bounds test developed by Pesaran, Shin, and Richard (2001) is employed to estimate the links owing to its superior small sample performance. This procedure is built on the *F*-statistic or Wald test in a generalized Dickey-Fuller type of regression normally used to test the significance of lagged levels of those variables that are under consideration in a conditional unrestricted equilibrium error correction model (Pesaran, Shin, and Richard 2001). The ARDL bounds test also helps to analyse the long-run relationships and short run dynamic interactions among variables in the study.

The proposed tests are based on standard *F*- and *t*-statistics used to test the significance of the lagged levels of the variables in a first difference regression. The test is applicable irrespective of whether the underlying regressors are I(0), I(1) or mutually integrated. It entails the estimation of the unrestricted error correction model (UECM) specified in equation (5) following Pesaran, Shin, and Richard (2001).

$$VY_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1 VY_{t-1} + \sum_{i=1}^{p} \alpha_2 VY_{t-i} + \beta_1 Y_{t-1} + \beta_2 Z_{t-1} + \varepsilon_{1t}, \quad (5)$$

where Y_t is the vector of dependent variables, Z_t is the vector of explanatory variables, V is the difference operator, P is the lag structure, α_1 and α_2 are the short run coefficients, β_1 and β_2 are the long run coefficients, while ε_{1t} are the residual terms. The null hypothesis of no long run equilibrium relationship will be tested (i.e. $H_0: \beta_1 = \beta_2 = 0$) against the alternative hypothesis of the existence of long run relationships (i.e. $H: \beta_1 \neq \beta_1 \neq 0$) using the *F*-test as suggested in Pesaran, Shin, and Richard (2001). However, this test has nonstandard distributions depending on the sample size, the inclusion of intercept and trend variable in the equation, as well as the number of regressors.

The estimated ARDL test statistics will be compared with two asymptotic critical values reported in Pesaran, Shin, and Richard (2001) as against the conventional critical values. If the test statistic is above an upper critical value, it implies that the null hypothesis of no long-run relationship is rejected, but if it is below a lower critical value, the null hypothesis will be accepted. If it, however, falls between these two bounds or critical values, the result is declared inconclusive.

Hence, following Pesaran, Shin, and Richard (2001), the models estimated are specified in equations (6) to (9) as follows:

$$\Delta \ln\text{GDP}_t = \beta_0 + \beta_1 \ln\text{GDP}_{t-1} + \beta_2 \ln\text{HC}_{t-1} + \beta_3 \ln\text{EX}_{t-1}$$
$$+ \beta_4 \ln\text{TO}_{t-1} + \beta_5 \ln\text{INV}_{t-1}$$
$$+ \sum_{i=1}^{p} \theta_1 \Delta \ln\text{GDP}_{t-1} + \sum_{i=1}^{p} \theta_2 \Delta \ln\text{HC}_{t-1} + \sum_{i=1}^{p} \theta_3 \Delta \ln\text{EX}_{t-1}$$
$$+ \sum_{i=1}^{p} \theta_4 \Delta \ln\text{TO}_{t-1} + \sum_{i=1}^{p} \theta_5 \Delta \ln\text{INV}_{t-1} + \varepsilon_{1t}, \tag{6}$$

$$\Delta \ln\text{INF}_t = \phi_0 + \phi_1 \Delta \ln\text{INF}_{t-1} + \phi_2 \Delta \ln\text{EX}_{t-1} + \phi_3 \Delta \ln\text{TO}_{t-1}$$
$$+ \phi_4 \Delta \ln\text{MS}_{t-1} + \phi_5 \Delta \ln\text{GDP}_{t-1}$$
$$+ \sum_{i=1}^{p} \delta_1 \Delta \ln\text{INF}_{t-1} + \sum_{i=1}^{p} \delta_2 \Delta \ln\text{EX}_{t-1} + \sum_{i=1}^{p} \delta_3 \Delta \ln\text{TO}_{t-1}$$
$$+ \sum_{i=1}^{p} \delta_4 \Delta \ln\text{MS}_{t-1} + \sum_{i=1}^{p} \delta_5 + \Delta \ln\text{GDP}_{t-1} + \varepsilon_{2t}, \tag{7}$$

$$\Delta \ln\text{INT}_t = \vartheta_0 + \vartheta_1 \ln\text{INT}_{t-1} + \vartheta_2 \ln\text{EX}_{t-1} + \vartheta_3 \ln\text{TO}_{t-1}$$
$$+ \vartheta_4 \ln\text{INV}_{t-1} + \vartheta_5 \ln\text{MS}_{t-1}$$
$$+ \sum_{i=1}^{p} \gamma_1 \ln\text{INT}_{t-1} + \sum_{i=1}^{p} \gamma_2 \ln\text{EX}_{t-1} + \sum_{i=1}^{p} \gamma_3 \ln\text{TO}_{t-1}$$
$$+ \sum_{i=1}^{p} \gamma_4 \ln\text{INV}_{t-1} + \sum_{i=1}^{p} \gamma_5 \ln\text{MS}_{t-1} + \varepsilon_{3t}, \tag{8}$$

$$\Delta \ln\text{TB}_t = \alpha_0 + \alpha_1 \ln\text{TB}_{t-1} + \alpha_2 \ln\text{EX}_{t-1} + \alpha_3 \ln\text{TO}_{t-1}$$
$$+ \alpha_4 \ln\text{INV}_{t-1} + \alpha_5 \ln\text{GDP}_{t-1}$$
$$+ \sum_{i=1}^{p} \omega_1 \ln\text{TB}_{t-1} + \sum_{i=1}^{p} \omega_2 \ln\text{EX}_{t-1} + \sum_{i=1}^{p} \omega_3 \ln\text{TO}_{t-1}$$
$$+ \sum_{i=1}^{p} \omega_4 \ln\text{INV}_{t-1} + \sum_{i=1}^{p} \omega_5 \ln\text{GDP}_{t-1} + \varepsilon_{4t}, \tag{9}$$

where Δ is the first difference operator, β_{1-5}, ϕ_{1-5}, ϑ_{1-5}, and α_{1-5} are long-run multipliers corresponding to long-run relationships, β_0, ϕ_0, ϑ_0, and α_0 are drifts, θ_{1-5}, δ_{1-5}, γ_{1-5}, and ω_{1-5} are the short run dynamic coefficients of the underlying ARDL model in the equation; t is a time or trend variable, and ε_{1-4} are white noise errors. The dependent variables are variables used to proxy macroeconomic performance such as trade balance per capita (TB) captured by net export per capita, economic growth

TABLE 1 List of Variables and Descriptive Statistics

(1)	(2)	(3)	(4)	(5)	(6)	(7)
GDP	GDP per capita	US$ (constant 2010)	1698.35	419.07	2548.43	1147.75
TB	Trade bal. per capita	US$ (constant 2010)	155.47	141.75	436.22	−133.33
INF	Inflation rate	CPI (2010 = 100)	18.65	16.24	72.84	3.46
INT	Mon. policy rate	Rate (%)	10.89	5.11	26.00	3.50
EX	Exchange rate	US$ = N	54.58	65.24	193.28	0.546
INV	Investment	GFCF as % of GDP	14.67	7.28	35.22	5.46
HC	Enrolment rate	Secondary (both sexes)	24.62	11.99	43.84	4.41
TO	Trade openness	Trade as % of GDP	47.69	16.44	81.81	19.62
MS	Financial deepening	M2 as % of GDP	22.51	7.17	43.27	10.04

NOTES Column headings are as follows: (1) Variables, (2) descriptive, (3) measurement unit, (4) mean, (5) standard deviation, (6) maximum, (7) minimum.

captured by real gross domestic product per capita (GDP), inflation rate captured by consumer price index (INF) and interest rate measured by monetary policy rate (INT). The explanatory variables include exchange rate (EX), and other controlled variables like investment (INV), proxied with gross fixed capital formation (GFCF), human capital (HC), which is proxied with secondary school enrolment rate, trade openness (TO) proxied with total trade as a ratio of real GDP and money supply captured by the ratio of money supply to real GDP (MS). It is expected that exchange rate depreciation will positively impact trade balance as export is expected to be boosted, positively enhancing output, negatively impacting inflation, due to imported inflation for Nigeria and raising the interest rate to curtail the inflation.

Data Description and Pre-Estimation Tests

This study used annual time series data spanning from 1970 to 2015. The data were extracted from the World Development Indicator (see http://wdi.worldbank.org) and the Central Bank of Nigeria *Annual Statistical Bulletin* (see https://www.cbn.gov.ng/documents/statbulletin.asp). Table 1 presents the descriptive statistics of the indicators. The average growth rate of the macroeconomic performance variables revealed US$1,698.35, US$155.47, 18.65% and 10.89% for GDP per capita, trade balance per capita, inflation rate and interest rate respectively. The mean value of exchange rate and secondary school enrolment stood at N54.58
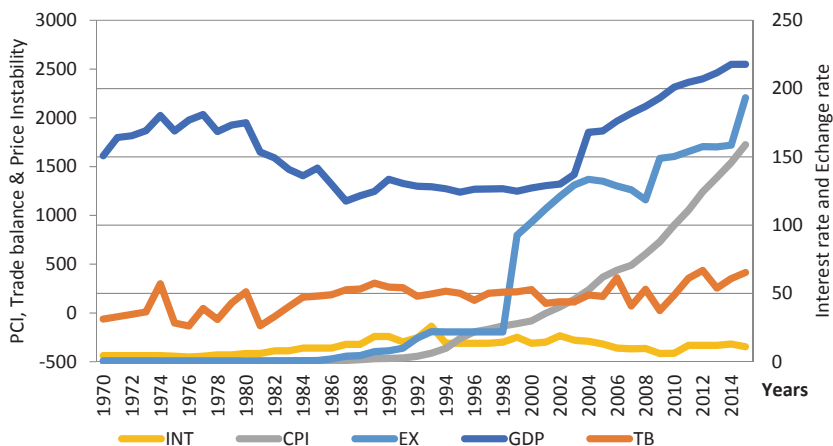
FIGURE 1   Exchange Rate and Macroeconomic Performance
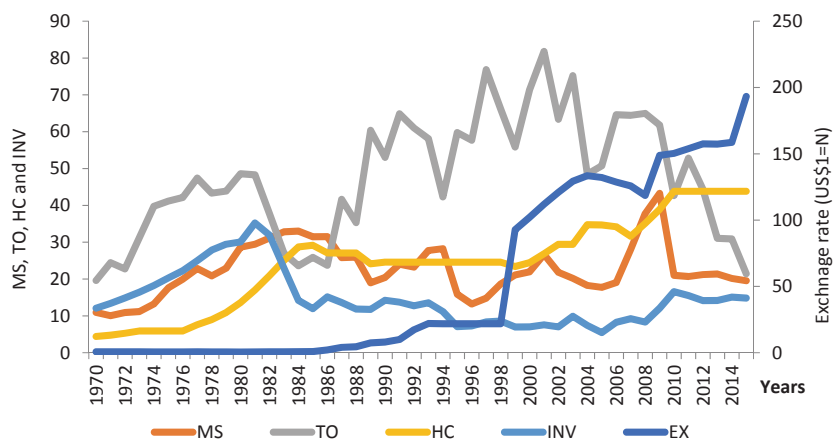
FIGURE 2   Exchange Rate, Money Supply, Trade Openness, Human Capital, and
Investment

to a US dollar and 24.62% respectively within the considered periods.
For other explanatory indicators, the average values of investment, total
trade and money supply to the size of the Nigerian economy were 14.67%,
47.69% and 22.51% correspondingly.

The graphical illustrations of our variables are depicted in figures 1 and
2. Figure 1 shows the trend analysis of exchange rate and macroeconomic
performance such as per capita income, trade balance, price instability
and interest rate. Trend movement of the exchange rate and other ex-
planatory variables like financial deepening, trade openness, human cap-

TABLE 2   Correlation Matrix

	GDP	TB	INF	INT	EX	MS	TO	HC	INV
GDP	1								
TB	0.115	1							
INF	−0.403	−0.002	1						
INT	−0.482	0.532	0.331	1					
EX	0.555	0.465	−0.291	0.243	1				
INV	−0.038	0.014	0.003	0.064	0.080	1			
HC	−0.304	0.166	0.116	0.494	0.258	0.092	1		
TO	0.278	0.669	−0.090	0.476	0.796	0.356	0.201	1	
MS	0.267	−0.431	−0.099	−0.567	−0.423	0.193	−0.378	−0.421	1

TABLE 3   ADF Unit Root Tests for the Variables at Levels and First Differences

Variables	Levels		First difference		Results
	No trend	Trend	No trend	Trend	
GDP	0.2521	−0.2053	−5.9050**	−6.5328**	I(1)
TB	−3.6708**	−5.1622**	–	–	I(0)
INF	−3.2838*	−3.2934	−6.8328**	−6.8010**	I(1)
INT	−2.3267	−2.3738	−7.2042**	−7.2501**	I(1)
EX	0.9479	−1.5310	−5.7889**	−6.1582**	I(1)
INV	−4.6314**	−5.7012**	–	–	I(0)
HC	−1.0342	−2.2190	−4.2636**	−4.2158**	I(1)
TO	−2.4497	−2.0148	−7.9537**	−8.3016**	I(1)
MS	−3.3666*	−3.5246**	–	–	I(0)

NOTES   ** and * denotes significance level at 1% and 5% respectively.

ital and investment are shown in figure 2. The trend reviews of the figures do not show clear direction (whether positive or negative) of all the macroeconomic indicators with the exchange rate. The inconclusiveness of the direction of our variables necessitates the need for an empirical analysis.

Table 2 shows the results of the correlation coefficients indicating that the problem of multicollinearity has been checked for our autoregressive distributed lag (ARDL) outputs. The first pre-estimation test conducted was to establish the order of integration of all indicators as they are critical to the estimation because estimating a time series model with non-

TABLE 4　Result of ARDL Bounds Test for Cointegration Relationship

Dependent variables	Functions	F-statistics
GDP Model ARDL (4,1,3,4,4)	$F_{\text{GDP}}(\text{GDP}|\text{HC, EX, TO, INV})$	4.0483**
Price instability Model ARDL (4,4,3,4,3)	$F_{\text{INF}}(\text{INF}|\text{EX, TO, MS, GDP})$	6.6905***
Interest rate Model ARDL (1,4,0,4,2)	$F_{\text{INT}}(\text{INT}|\text{EX, TO, INV, MS})$	4.4786**
Trade balance Model ARDL (2,0,1,0,1)	$F_{\text{TB}}(\text{TB}|\text{EX, TO, INV, GDP})$	8.5002***

	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
Critical bound values	3.74	5.06	2.86	4.01	2.45	3.52

NOTES　***, **, and * denote rejection of null hypothesis at 1%, 5% and 10% significance levels respectively.

stationary regressors could lead to spurious regression. This study used the Augmented Dickey Fuller (ADF) test by Dickey and Fuller (1979) to ascertain the stationarity level of all variables. The unit root result suggests that all the variables are of order one except trade balance, investment and money supply which are found to be integrated of order zero. The results of the unit root tests are presented in table 3.

The result from the integration test confirmed the appropriateness of the chosen estimation technique (ARDL). Moreover, the results of the ARDL bounds tests for cointegration are presented in Table 4. The Akaike Info Criterion (AIC) was used to select the orders of the ARDL models.

The result revealed that the computed *F*-statistics are greater than the upper bound critical values indicating that the null hypotheses of no cointegration are rejected at 5% significance level. This implies that there is satisfactory evidence in support of a unique and stable long-run relationship between currency depreciation and macroeconomic performance in Nigeria.

Empirical Results and Discussion

Tables 5 and 6 present both the long-run estimates and the diagnostic and stability tests respectively. Models 1–4 revealed the ARDL models for output growth, price instability, interest rate and trade balance correspondingly. Table 5 shows that naira depreciation has a positive and significant impact on all the indicators of macroeconomic performance considered within the periods except for output per capita which was found insignificant at 5% significance level. In magnitude terms, a 10% change in depreciation of Naira would positively increase output per capita, inflation

TABLE 5   Results of the Estimated ARDL Long-Run Coefficients

Independent variables	Dependent variables			
	(1)	(2)	(3)	(4)
Constant	12.335 (2.904)***	−1.529 (3.630)	−3.267 (1.947)	6.354 (1.670)***
HC	0.081 (0.208)			
EX	0.061 (0.087)	0.108 (0.004)**	0.200 (0.058)***	1.437 (0.312)***
TO	−0.101 (0.045)**	0.084 (0.283)*	0.707 (0.279)**	−0.381 (0.143)**
INV	−0.054 (0.061)		0.932 (0.395)**	0.233 (0.153)
MS		0.300 (0.239)	−0.076 (0.287)	
GDP		−0.020 (0.398)		−0.741 (0.223)***

NOTES   Column headings are as follows: (1) output growth, (2) price instability, (3) interest rate, (4) trade balance. ***, **, and * denote rejection of null hypothesis at 1%, 5% and 10% significance levels respectively.

rate, interest rate and trade balance per capita by 0.61%, 1.08%, 2.0% and 14.37% respectively. It suggests that Naira depreciation stimulates economic activity and trade balance but adversely affects the cost of doing business and create price instability. The result is in tandem with the findings of Ogbonna (2011); Umoru and Oseme (2013) and Adediran, Yusuf, and Adeyemi (2014) that currency depreciation improves trade balance and output growth. However, the improvement has its economic costs in terms of high cost of business and inflation. Thus, the study found that naira depreciation enhances economic performance.

The result also found that openness to trade has a significant and adverse effect on trade balance and the overall output growth of the Nigerian economy. A 10% increase in trade openness deteriorates per capita output and trade balance by 1.01% and 3.81% respectively. Likewise, openness to trade has a positive and significant impact on inflation rate and interest rate. It implies that inflation rate and interest rate increase by 0.8% and 7.1% respectively as a result of 10% increase in openness of trade. The result further showed the coefficients of investment have a positive impact on interest rate and trade balance while it negatively affects output. A 10% increase in investment leads to a decrease in output by 0.54%. Also, an increase in investment by 10% leads to an increase in interest rate and trade balance by 9.3% and 2.33% respectively. The result also indicates that the coefficient of money supply has no significant impact on inflation rate and interest rate. Conversely, the coefficient of income per capita has a negative but insignificant impact on the inflation rate.

TABLE 6   ARDL Short-run Coefficients: Model 1

Variables	Coefficient	Std. error	t-statistics	Probability
$\Delta(\text{GDP}(-1))$	0.103691	0.171844	0.603400	0.5527
$\Delta(\text{GDP}(-2))$	−0.138708	0.171330	−0.809598	0.4272
$\Delta(\text{GDP}(-3))$	0.285443	0.164249	1.737872	0.0969
$\Delta(\text{HC})$	0.238296	0.176991	1.346376	0.1925
$\Delta(\text{EX})$	−0.086272	0.040394	−2.135766	0.0446
$\Delta(\text{EX}(-1))$	−0.030093	0.049479	−0.608186	0.5496
$\Delta(\text{EX}(-2))$	−0.048727	0.040808	−1.194074	0.2458
$\Delta(\text{TO})$	−0.065438	0.056581	−1.156537	0.2604
$\Delta(\text{TO}(-1))$	0.041455	0.062322	0.665169	0.5132
$\Delta(\text{TO}(-2))$	−0.093743	0.064255	−1.458911	0.1594
$\Delta(\text{TO}(-3))$	0.137556	0.063402	2.169584	0.0417
$\Delta(\text{INV})$	−0.053294	0.082225	−0.648154	0.5239
$\Delta(\text{INV}(-1))$	0.183514	0.087796	2.090242	0.0489
$\Delta(\text{INV}2))$	−0.188776	0.088033	−2.144369	0.0439
$\Delta(\text{INV}(-3))$	0.203321	0.066493	3.057752	0.0060
$\text{ECT}(-1)$	−0.216512	0.100963	−2.144469	0.0432

The dynamic short-run estimates report both positive and negative relationship between the lags of Naira depreciation and macroeconomic performance, as presented in tables 6–9. The coefficients of the error correction term (ECT) for the models were found to be negative and significant at 5% significance level ranging within the magnitude of 11.2% and 48.5%. It implies that approximately, 11.2% to 48.5% disequilibrium in the previous year's shocks on macroeconomic performance converge to long-run equilibrium in the current year. Thus, this supports the existence of long-run relationship between exchange rate and macroeconomic performance in Nigeria.

The diagnostic and stability tests are presented in table 10. The estimated models passed all diagnostic tests indicating that the error terms have same variance, are normally distributed and uncorrelated. The functional form test confirms that the models are well specified except output growth and interest rate models that failed the serial correlation and functional form tests respectively. The results of cumulative sum and cumulative sum of square fall within the critical bounds at 5% significance level indicating that the parameters are stable over the sample periods.

TABLE 7   ARDL Short-run Coefficients: Model 2

Variables	Coefficient	Std. error	t-statistics	Probability
$\Delta(\text{CPI}(-1))$	0.691703	0.134822	5.130471	0.0001
$\Delta(\text{CPI}(-2))$	−0.334044	0.155172	−2.152728	0.0444
$\Delta(\text{CPI}(-3))$	0.296855	0.152035	1.952538	0.0658
$\Delta(\text{EX})$	0.015639	0.052347	0.298749	0.7684
$\Delta(\text{EX}(-1))$	−0.131723	0.060822	−2.165715	0.0433
$\Delta(\text{EX}(-2))$	0.120070	0.066886	1.795148	0.0886
$\Delta(\text{EX}(-3))$	−0.144823	0.055389	−2.614639	0.0170
$\Delta(\text{TO})$	−0.022886	0.060006	−0.381400	0.7071
$\Delta(\text{TO}(-1))$	0.061598	0.070359	0.875482	0.3922
$\Delta(\text{TO}(-2))$	−0.121883	0.068936	−1.768052	0.0931
$\Delta(\text{MS})$	−0.127220	0.075814	−1.678055	0.1097
$\Delta(\text{MS}(-1))$	0.165312	0.088561	1.866651	0.0775
$\Delta(\text{MS}(-2))$	−0.006453	0.085367	−0.075590	0.9405
$\Delta(\text{MS}(-3))$	−0.110480	0.067213	−1.643730	0.1167
$\Delta(\text{GDP})$	−0.758488	0.215093	−3.526319	0.0023
$\Delta(\text{GDP}(-1))$	0.527733	0.264206	1.997429	0.0603
$\Delta(\text{GDP}(-2))$	−0.885079	0.225297	−3.928498	0.0009
$\text{ECT}(-1)$	−0.252040	0.044018	−5.725830	0.0000

Conclusion

The Nigerian economy depends so much on the proceeds of crude oil exports, which is foreign currency denominated. Hence, it has serious implications on the Nigerian economy pertaining to budget preparation. It also makes the economy susceptible to external shocks. The recent fall in the international crude oil price plunged the country into recession and put pressure on its external reserve. This prompted a study of this nature between 1970 and 2015. The study adopted the ARDL bound testing approach to establish the macroeconomic implications of exchange rate depreciation on income, inflation rate, interest rate and trade balance. It was confirmed that naira depreciation has a positive and significant impact on all the indicators of macroeconomic performance except for output per capita, which was found to be insignificant. This suggests that Naira depreciation stimulates economic activity and trade balance but also cause price instability and high-interest rate.

TABLE 8 ARDL Short-Run Coefficients: Model 3

Variables	Coefficient	Std. error	t-statistics	Probability
Δ(EX)	0.449025	0.109941	4.084253	0.0004
Δ(EX(−1))	0.072957	0.147115	0.495923	0.6241
Δ(EX(−2))	−0.272227	0.155551	−1.750076	0.0919
Δ(EX(−3))	0.321780	0.113559	2.833594	0.0088
Δ(TO)	0.342377	0.129655	2.640682	0.0138
Δ(INV)	−0.353070	0.176507	−2.000321	0.0560
Δ(INV(−1))	0.009363	0.253250	0.036972	0.9708
Δ(INV(−2))	−0.050365	0.248222	−0.202902	0.8408
Δ(INV(−3))	−0.303311	0.191648	−1.582647	0.1256
Δ(MS)	0.137267	0.177800	0.772032	0.4471
Δ(MS(−1))	−0.431731	0.160977	−2.681945	0.0125
ECT(−1)	−0.484618	0.111190	−4.358479	0.0002

TABLE 9 ARDL Short-Run Coefficients: Model 4

Variables	Coefficient	Std. error	t-statistics	Probability
Δ(TB(−1))	0.290198	0.142747	2.032955	0.0497
Δ(EX)	0.160992	0.043268	3.720828	0.0007
Δ(TO)	0.598303	1.736739	0.344498	0.7325
Δ(INV)	0.260575	0.172362	1.511791	0.1396
Δ(GDP)	1.175869	0.619252	1.898855	0.0659
ECT(−1)	−0.112026	0.019275	−5.812040	0.0000

The study is in line with Junz and Rhomberg (1973), Wilson and Takacs (1979), and Bahmani-Oskooee and Kara (2003), which suggested that currency depreciation enhances trade balance of countries operating fixed exchange rate. It is also in tune with Ali and Anwar (2011), which found that exchange rate fluctuation results in a price increase and an improvement in the trade balance. The study confirms the existence of a long-run relationship between exchange rate depreciation and macroeconomic performance in Nigeria. We therefore conclude that exchange rate depreciation has severe implications on macroeconomic performance in Nigeria. To this end, it is pertinent to diversify trade by embarking on export promotion strategies that can sustain gains of exchange rate movements and mitigate its negative consequences on the economy.

TABLE 10 Model Diagnostic and Stability Tests

Test statistics	Dependent variables			
	(1)	(2)	(3)	(4)
Serial correlation	5.1299 (0.017)	5.789 (0.009)	4.214 (0.270)	1.841 (0.175)
Funct. form	1.2351 (0.231)	2.063 (0.054)	0.948 (0.352)	0.814 (0.433)
Normality	1.420 (0.492)	1.100 (0.577)	1.199 (0.349)	0.499 (0.779)
Heteroskerdasticity	0.503 (0.935)	1.328 (0.317)	0.473 (0.934)	1.373 (0.289)
CUSUM	Stable	Stable	Stable	Stable
CUSUMQ	Stable	Stable	Stable	Stable
ECT(−1)	−0.217 (0.101)***	−0.252 (0.044)***	−0.485 (0.111)***	−0.112 (0.019)***

NOTES Column headings are as follows: (1) output growth, (2) price instability, (3) interest rate, (4) trade balance. The values in brackets are the probability values for the diagnostic and stability tests; *** and ** denote rejection of null hypothesis at 5% and 10% significance levels respectively.

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Different Ways of Environmental Issue Management by Active Citizens: Case Studies from Hungary

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The paper illustrates how active citizens can manage environmental issues by participation in local or national programs or events. The aim of this paper is to provide – on the one hand – the theory of social participation of active citizens with the focus on environmental issues. On the other hand, the paper attempts to illustrate the topic with three good examples from Hungary based on secondary information and interviews. The first one is a program of school gardens; the second one is an issue in Szentgotthárd and is related to the case of a planned incinerator, which was banned by the debut of local civic organisations some years ago. The third program namely TeSzedd (the program is about collecting litter in an organised campaign in Hungary) is a case, which is initiated by a top down approach but managed by local citizens. The results show that citizens can be active in shaping environmental issues but the most important factor seems to be that they need to be concerned personally about the issues.

Introduction

Environmental issues can be managed by different kind of actors and different kind of ways. This study illustrates how the active citizens can participate in managing these kinds of issues. Recently, researchers have shown an increased interest in social participation in environmental issues. The aim of this study is to examine good cases in Hungary related to environmental issues management and to add to the literature by providing a list about the different kind of activities in environmental issues.

These three cases are involved in the research: the method of school gardens, a case in Szentgotthárd and the TeSzedd Program (the program is about collecting litter in an organized campaign in Hungary).

The first part of the study provides a literature overview about active democracy, active citizenship and environmental issues. This part lays out the dimensions of environmental participation and the activity list related to participation. The article continues by introducing three good cases in Hungary. The last part presents the conclusions.

The paper provides guidance also for practitioners and researchers and it also adds some possible good examples about managing environmental issues to the literature. It is possible to believe that learning how to manage these types of activities is our common responsibility.

Theoretical Background: Active Democracy, Active Citizenship and Environmental Issues

Active democracy (Reisinger 2009) means that citizens take part in those local, regional, national, or just like international issues, which can influence their life and wellbeing. In this democracy, citizens are open for shaping their environment, telling their ideas and solving problems together with other citizens or institutions. Participation of citizens and civil organisations can be termed social participation which is related to social responsibility; people who care about their society in a given way are responsible not just for their own life but also for their society (Nárai-Reisinger 2016). Newman and Tonkens (2011) have also investigated the relationship between participation and responsibility.

Active democracy and social participation need active citizens. The question arises: who the active citizens are. 'Citizenship defines rights and responsibilities, in turn creating a dynamic debate about the duties of citizens as members of the community. Traditionally, active citizenship has included participating in elections or referendums, standing for a political office, and actively or passively engaging as member of a political party or politically affiliated organisation. However, this strict definition has expanded. A core element of active citizenship is now seen as engagement in civil society through membership in or support of organisations, involvement in political debates and public consultation processes, participation in demonstrations or protests, volunteering, and awareness of topical issues.' (European Youth Forum 2013, 3) As it can be seen, participation is the core concept in this term. Also Hoskins (2006, 10) demonstrates active citizenship as 'participation in civil society, community and/or po-

litical life, characterised by mutual respect and non-violence and in accordance with human rights and democracy.'

Based on these approaches, it is important that active citizenship is more than just voting and knowing the rights, it means that active citizens take certain actions in favour of the society. In the literature, there is no unified concept about the potential activities of an active citizen; the approaches vary from author to author. In one of her previous studies, Reisinger (2017) identified 33 activities along the following fields (Jochum, Pratten, and Wilding 2005; Bee 2017):

- activities related to civil/non-profit organisations or good cases,
- activities concerned with local governments,
- activities from home,
- personal responsibility,
- monitoring and/or intervention in local/national issues, and
- political participation.

Each of the above activity groups include such activities, which are in some from related to environmental issues. Of course it does matter how far-reaching these issues are, who their participants are, and how much time is provided to get information about the given environmental issue, dispute, learn, evaluate the situation and to make a decision if it is needed. It also does matter whether it is a political/governmental issue or an activity that does not require decision-makers participation, that is to say the activity is the local initiation of the citizens. The question may arise why the participation of citizens, civil organisations is necessary at all in these issues. Gabriella Kiss (2013, 30) drew up its advantage that 'the more value we involve in the process, the more the knowledge will be and the more the acceptance and trust will increase, and the more we learn democracy and are able to handle the risks together or to agree in avoiding them.' Moreover, activity also means that type of behaviour when citizens behave by protecting their environment, e.g. collecting waste selectively, not lavishing resources, as well as when they appear as supporters in case of environmental issues. In case of these we do not speak about participation in decision-making but about issues affecting our environment in our everyday life. Figure 1, which was created by the authors based on information from the literature and the practice, illustrates the dimensions of participation in environmental issues.

Environmental conscious approach and environmental responsibility are needed to appear in rearing at an early age so that a society could have
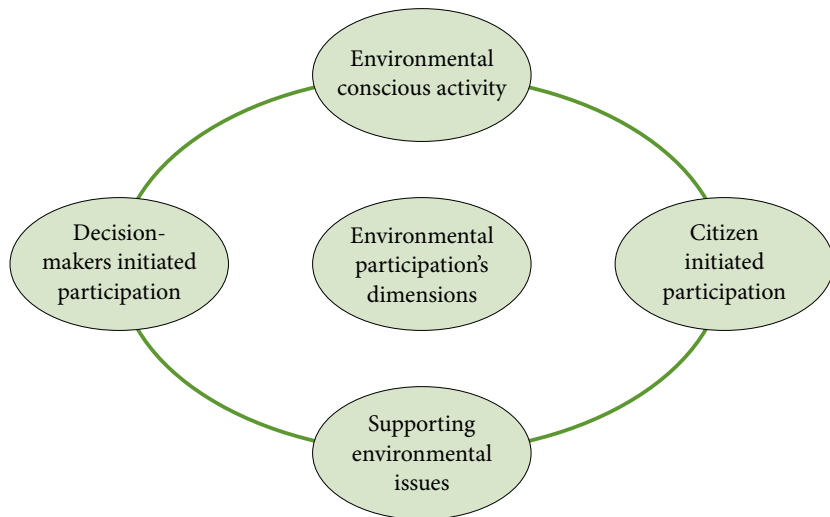
FIGURE 1   Dimensions of Environmental Issue Participation

the highest possible number of active citizens in case of environmental issues. Environmental conscious behaviour means that people habitually pay attention to protect their environment (Major 2012). A citizen will participate in social issues if they feel responsibility towards social actors and processes, which is also true for the participation in environmental issues. Besides responsibility, commitment and the will to act are also needed, thus those citizens who besides realising where they can reach changes with their participation, support, and ideas, also invest time and energy so that their activity could be seen in practice will participate actively in managing and supporting environmental issues. We think that formal education and familial patterns have determining role in this process. In case of education Yueh (2007 cited by Khademi-Vidra 2017, 68) enhances that 'countries in Europe determined that environmental problems are specific to each country and each region and so countries should produce their own Environmental Education programs to solve their own problems.'

There are many ways of being active in environmental issues (table 1). This form of the categorisation of activities cannot be found in the literature, thus table 1 is the own concept of the authors and it collects and categorises the activities of environmental issue management. On the one hand citizens can be active in indirect way, which means that they do not take part directly in activities, but they support them, or they are in-

TABLE 1   Types of Environmental Issue Management Activities

Dimensions	Indirect way	Direct way		
		(1)	(2)	(3)
Environmental conscious activity	Getting information about environmental issues.	Collecting litter; Selective waste collection; Purchasing environmentally-friendly items; Energy-saving practices.		
Supporting environmental issues	Donating to civil/non-profit organisations dealing with environmental issues; 1% donation; Writing blogs on environmental topics; Writing letters to local representatives about environmental issues.	Signing up petition.	Volunteer activity in civil/non-profit organisations dealing with environmental issues; Being a member in civil/non-profit organisations dealing with environmental issues; Being a leader in civil/non-profit organisations dealing with environmental issues; Working for civil/non-profit organisations dealing with environmental issues.	Signing up petition.

Continued on the next page

formed. Perhaps it can be thought that these activities are not real participation but we think that they are. E.g. donating to civil/non-profit organisations dealing with environmental issues is a very important activity, because these organisations have an important role in environmental protection and environmental issue management. On the other hand citizens can be active directly, too, through many kinds of activities. Table 1 illustrates the activities based on the four dimensions shown in figure 1.

TABLE 1   *Continued from the previous page*

Dimensions	Indirect way	Direct way		
		(1)	(2)	(3)
Citizen initiated participation		Organising petition; Signing up petition; Collecting litter; Protesting; Interest conciliation.	Organising petition; Collecting litter; Protesting; Interest conciliation.	Organising petition; Protesting; Interest conciliation.
Decision-makers initiated participation		Participating in public hearings or local forums; Giving own ideas in public hearings or local forums; Participating in Citizens' Juries and in other forms of consultative methods; Giving own ideas in Citizens' Juries and in other forms of consultative methods; Giving opinions and ideas to environmental strategies and plans; Signing up petition.	Giving opinions and ideas to environmental strategies and plans; Protesting; Protesting through legal way; Interest conciliation; Signing up petition.	Giving opinions to environmental strategies and plans; Protesting; Protesting through legal way; Interest conciliation; Signing up petition.

NOTES   Column headings are as follows: (1) personally, (2) through civil/non-profit organisations, (3) through organised movements.

Case Studies from Hungary

In this part, we illustrate good practices, which represent the literature background appropriately, and provide a good basis to synthesise it and think it further.

METHODS

The aim of this study is to illustrate three Hungarian cases about the environment issue management. This qualitative method offers an effective and reliable way to illustrate environmental issue management. Different

authors have introduced management techniques also with case studies (Kiss 2013; Kasymova and Gaynor 2014; Motherway 2003; Barclay 2016). The following three cases are involved to be examined:

- Local level: school gardens
- Regional level: the case of Szentgotthárd
- National level: TeSzedd Program (the program is about collecting litter in an organised campaign in Hungary)

Of course, there are other good examples in Hungary, however, our aim was to illustrate cases, which have many years of history, are successful, and show in a complex way how variably the citizens can contribute to environmental issue management. We chose cases, which illustrate well at different territorial levels how citizens can participate in environmental issues and form them. Although school gardens are nationally existing organisations, their operation is managed at local level, so they strengthen local participation. In case of school gardens, the emphasis is not put on solving a problem, but on environmental education, environmental consciousness and participation. The case of Szentgotthárd is a good example of how civil organisations and citizens can cooperate against an investment in favour of the area. The third example is a nationally organised movement, a few days long litter collection the aim of which is to clean the country, build community, and to raise environmental consciousness. We think that the method chosen is properly linked to the topic, since we can effectively illustrate with good practices and examples how diversely the citizens can be active in environmental issues management in practice. Table 2 illustrates into which group of activity introduced in table 1 the good cases chosen by the authors could be categorised.

The cases are based on the following information:

- homepages of the cases,
- documents,
- literatures,
- interviews during 2018 spring:
    1. András Albert Halbritter: founding member of the Hungarian Foundation for School gardens,
    2. Cecília Szigeti: local coordinator of the TeSzedd in Győr.

GARDEN BASED LEARNING: SCHOOL GARDENS

School gardens are not new organisations, their history dates back to the Middle Ages (Subramaniam 2002). Philosophers like e.g. Rossueau,

TABLE 2 The Cases Introduced by the Authors Based on the Groups of Table 1

Dimensions	Indirect way	Direct way		
		(1)	(2)	(3)
Environmental conscious activity	Szentgotthárd TeSzedd	School gardens TeSzedd		
Supporting environmental issues		Szentgotthárd	School gardens Szentgotthárd	Szentgotthárd
Citizen initiated participation		School gardens Szentgotthárd	School gardens Szentgotthárd	Szentgotthárd TeSzedd
Decision-makers initiated participation		Szentgotthárd	Szentgotthárd	Szentgotthárd TeSzedd

NOTES Column headings are as follows: (1) personally, (2) through civil/non-profit organisations, (3) through organised movements.

Comenius or Montessori at the beginning of the 20th century, all emphasised the role of school gardens and practical education. 'School gardens provide a real world context for learning that is distinguishable from typical hand-on learning activities in the classroom, which tend to be simulation of real world experiences.' (Ratcliffe 2007, 101, cited by Wei 2013, 15) School gardens are places in kindergartens, schools where children can learn how to plant and grow e.g. vegetables, but the method is more than just gardening. The different kinds of activities in the garden develop personality, healthy living, responsibility and many kinds of social skills (e.g. cooperation, communication, creativity, etc.). Plants are only tools for teaching children these kinds of things.

There are many reasons why school gardens can contribute to social well-being and environmental consciousness; here are some of them (Desmond, Grieshop, and Subramaniam 2004, 25):

- Gardens can create opportunities for children to discover fresh food, make healthier food choices and become better nourished.
- Gardens offer dynamic settings in which to integrate every discipline including science and maths, language arts, history and social studies, and art.
- Young people can experience deeper understandings of natural systems and become better stewards of the earth.

- School garden projects nurture community spirit and provide numerous opportunities to build bridges among students, school staff, families, local businesses, and community based organisations. o Links with school gardens, school food service programmes, and local farms can ensure a fresh nutritious diet for children while teaching about sustainable food systems.

School gardens can contribute to active citizenship because participating in school gardens teaches how to think and take care about ourselves, about our environment and about life. It helps being responsible for the environment, learning how to be conscious about the environment and gives certain methods to manage environmental issues. As Ozer (2007, 861) summarised: 'school gardens are a promising approach in promoting the physical, psychosocial, and intellectual development of school-aged children [. . .].'

School gardens have gained a real popularity all over the world, the first gardens appeared at the beginning of the 19th century, nowadays there are countries where the number of gardens are of the order of thousands; e.g. in Hungary there are more than 1 100 school gardens and their number have been still growing.

To support and coordinate Hungarian gardens the Hungarian Foundation for School Gardens was established in 2015. Founding members are all school garden leaders, so they not just manage the organisation but also participate in the everyday work of a certain garden. The goal of the civil organisation can be read on the homepage of the foundation (www.iskolakertekert.hu): 'We would like to achieve by children's own experience the practical learning of responsible environment use, as an adult the ability to think responsibility on their environment. We would like to support children to obtain basic gardening knowledge after finishing schools as teenagers, by which they could contribute to their food supply, thus reducing the dependence and insecurity feelings.' With the following types of activities the foundation can contribute to the development of the school gardens and thereby can raise consciousness in environmental issues:

- establishing the Hungarian School Garden Network,
- maintaining a homepage to provide information,
- establishing a professional team,
- coordinating the work of gardens,
- organising programmes.

In Hungary school garden-based education was present in teacher's training more than one and a half centuries ago, and the revival of this movement is related to the Department of Natural Sciences Course-Pedagogy at the Apáczai Csere János Faculty of Széchenyi István University in Győr. Students participating in teacher's training get training about what it means to maintain a school garden, to cultivate it and to teach and coordinate those children who participate in the operation of it. The students cultivate the school garden located in the area of the faculty together with the pupils of the university's elementary school. The leader of the school garden is a founding member of the foundation as well, moreover, he is an associate professor of the university too.

THE CASE OF SZENTGOTTHÁRD

Conflict is inseparable from development. There is no development process which would take place without discrepancies; the definition of advancement, development includes discrepancy [...] If a development action takes place in a given territory, the starting point of the involved active participants is not necessarily the same. Everyone may have their own specific conception about the procedures to be followed, even if development is the common point for all of them. [Caul-Futy 1997, 7]

One of the success stories of active citizenship movement at regional level was an environmentally damaging investment that had been impeded by the joint action of a Hungarian city and its inhabitants and the joined civil organisations (the introduction of the investment is based on the study of Bándy (2010), and is a further-thought, revised, and completed version of it).

The only cross-border industrial park of Hungary (and Europe) is the Szentgotthárd-Heiligenkreuz Industrial Park, which was established in 1997. In 2006 Begas Kraftwerk GmbH planned to build in this industrial park, a thermal waste recycling plant which is apt for incinerating 200 000 tons of waste annually. According to the company's investment promise including 115 million euro, the plant may be apt for the economic and long-term supply of electricity and heat energy to regional plants. The developed energy would fully supply the whole industrial park, the province of Burgenland (Austria), and a part of Szentgotthárd as well (Lebensministerium 2009).

However, the inhabitants of Szentgotthárd, the leaders of the city, several civil organisations, and some environmental initiations found the

building of the incinerator troubling. According to their objection, even though the incinerator would be built on the Austrian side, it would be only 100 meters away from the Hungarian border, in the immediate vicinity of Szentgotthárd city having 10 000 inhabitants, and right next to three national parks. It was troubling that the plant would be built on the easternmost part of Burgenland, the furthest from Austrian cities in a place where the prevailing wind direction is north-eastern. It all meant that environmental burden would mostly affect Hungary, the Őrség National Park, the Szentgotthárd Thermal Park (investment value is 6.5 million euro), and the psychiatric institution in the surrounding area, the rehabilitation hospital, and the two elementary school educating one thousand children.

The investor got its own experts to make an impact study (RVH 2009) to prove that the plant would produce clean and cost-effective energy out of harmless waste. Begas emphasised its commitment to environmental protection and its high level of responsibility towards the quality of life in the region. In its environmental impact, study it clearly pointed out that the proper operation of the waste recycling plant did not have a negative impact on either the region or the direct environment. By building the energy park, Begas promised the creation of workplaces, and also adumbrated the possibility to minimize the costs of regional waste transport by building the plant.

The city of Szentgotthárd and its local government as well as the civil organisations learnt about the plan of Begas to build the plant right next to the Hungarian border first from Austrian, then from Hungarian media in the spring of 2006. Although the leadership of the city immediately asked for official information from the province of Burgenland, they did not get anything. After that, the city of Szentgotthárd turned to the Hungarian Ministry of Environment and Water. The Ministry asked for official reference from the Austrian government, but it was rejected by the Austrians by referring to the unavailability of an impact study which could be a basis for an official reference.

It is a highly important milestone that almost right after the news about the planned plant a civil initiation, the Pronas (Pro Natura St. Gotthard Civil Cooperation Association) an association containing more civil organisations was formed. The primary aim of Pronas initiation was to impede the building of the incinerator, and right after its establishment, it showed activity in this case. It attracted the attention with regular presentations, forums and demonstration, and maintained the interest to im-

pede the investment. Due to government interest, Begas stated in an of-
ficial announcement that they aimed at incinerating the waste produced
in Burgenland. It is, however, contradictory considering the capacity of
the planned plant. Burgenland's annual amount of waste, which is apt
for incineration, is 15 thousand tons, while the capacity of the plant is
250 thousand tons according to the investor. Technical parameters were
examined by an independent engineer expert office (Data Bridge 2007)
which, based on the investor's data, stated that the plant might be apt for
incinerating even 325 thousand tons of waste annually. Due to these dis-
crepancies, it was assumed that the investor did not only want to destroy
the waste of Burgenland, but the plant's capacity provided the possibil-
ity to destroy the waste of other provinces and later probably that of the
neighbouring countries.

Knowing the rate and amount of dangerous and non-dangerous waste
is extremely important. Site selection was troubling from the viewpoint of
air protection as well, especially if we consider that fact that the investor
wanted to build the plant in an area surrounded by natural reserves. The
Austrian impact study did not consider these aspects and did not contain
alternative solutions. Based on the expert opinions, the local government
of Szentgotthárd stated its attitude, and tried to solve the problem by con-
tinuously involving higher forum.

Accessing the status of party was a very important element in the pro-
cess. The Viennese law firm entrusted by the local government high-
lighted that providing the status had been legitimate according to the
Austrian legislations. The initiation got a wider space by accessing the
status of party since some decrees could be impeded by it (the study of
Gajdics 2012 describes the role of party status in more details).

Civils reacted to the problem very fast, and then an exemplary environ-
mental struggle began by accessing the status of party. Pronas, as the only
civil organisation having a party status, was able to act more effectively
against the investment than the initiations of private individuals. They
acquired financial sources by tender options for the events and the profes-
sional work, and then they fought against the building of the plant for six
and a half years. Their activity was characterised by spectacular demon-
strations and professionalism, the result of which was that they, as parties
in the authorisation process, made themselves all the professional materi-
als. Petitions compiled for Umweltsenat represented both professionally
and legally such a based viewpoint, which was apt for making arguments
in the course of decision-making. In the meantime, the 'simple' environ-

mental issue, beyond the legal process, became a political and diplomatic issue as well. Therefore the civils and the local government were backed by the competent ministry of the Hungarian government and the then President of the Republic (László Sólyom). The Ministry of Environment and Water (κνvM 2008) also published its viewpoint according to which the requirement for constant governmental interference is reasonable.

Due to the civil movement's significant activity, they succeeded in gaining over and bringing out all the highest representatives of the country over, and in extending the problem to internationalisation. Because of the desperate work, the media dealt with the incineration on a daily basis.

In this case, the importance of active citizenship highlighted that its tools were much wider than protest. Manifestations may include such effective tools, which mean the category of civil obedience, e.g. human chain, banners, strikes, halfway road closure. In 2007 the activity of Pronas brought Pro Pannonia into being, which was a cooperation against the incineration consisting of three countries (Slovenia, Austria, Hungary); and also in 2007 the Austrian cooperation partner of Pronas, an environmental civil organisation, the Bigas (Bürgerinitiative gegen Abfallschweinerei) was established. It can be said that as a result of the significant civil cooperation, Pronas represented the interests and the wish of the inhabitants against the incineration in the most effective way, because due to its enduring activity the investor withdrew its plan to build the incinerator. The enduring work of six and a half years, 162 events, and the cooperation of 30 thousand people proved the power of active citizenship aspiration as well as its exemplary successfulness (table 3).

Conflict is inseparable from development. Based on the case of Szentgotthárd, an important statement can be made: the cooperation of an affected community with the support of civil organisations may reach exemplary results. The plant would have already been built in the Szentgotthárd-Heiligenkreuz Industrial Park if the civil organisations had not cooperated with the city and the citizens following the public protest. In this case the importance and the efficiency of the civil organisation can be measured in that it did not only play the role of a 'communication channel' (Reisinger 2010) during the mediation between the citizens and the investor, but it represented the case as a party during the legal forums.

TESZEDD! PROGRAM

The national level of the volunteer movement is the 'TeSzedd' Volunteering for a clean Hungary program (http://szelektalok.hu/teszedd). The

TABLE 3   The Chronological Order of the Most Important Events
against the Incineration Plant

Important dates	Events
May 2006	News from the papers about the investment as a fact
June 2006	Civil protest at the border
July 2006	BEGAS Information Day in a Public Forum
November 2006	Establishment the PRONAS
2006–2008	Several conferences, protests, court files, referendum
February 2009	Burgenland Provincial Office gives permission for the plant
2009	More protests (inc. hunger strike), involving international lawyers
June 2010	Judicial permission in Austria for the investment
January 2012	In Güssing (Austria) Arnold Schwarzenegger's agitation for environmental friendly energy. Energy Globe Award for the ex-governor (USA).
May/June 2012	The Administrative Court Vienna cancelled the permission
November 2012	Declaration in official TV channel in Austria (ORF): 'There will be no waste incinerator'
2013–2015	Acknowledgements, conferences about the success, awards, prizes

NOTES   Based on Woki (2015).

acronym 'TeSzedd' in English is 'YouPick Campaign' (official) which
means that you pick up the litter yourself from the council land. This is
a waste picking day, a national clean-up program organised by the Min-
istry of Rural Development and National Waste Management Agency. It
has been taking place for seven years and organised in every September,
and lasts three days long. The movement was first organised in Hungary
in 2011 as an action against the illegal dumping of waste.

The aims of the action are as follows:

- to bring together all those who want to do it in order to live in a
  cleaner, healthier environment,
- to destroy the illegally decomposed garbage dumps,
- to promote an environmentally conscious way of thinking,
- to focus public attention on the importance of preserving a sustain-
  able environment,
- preventing waste generation,
- to raise citizens' awareness on the litter problem,
- help changing people's behaviour.

TABLE 4   'TeSzedd' in Numbers

Year	Number of participants (registered)	Number of venues	Litter (in 1000 tons)
2011	162 000	1 500	No data
2012	110 000	1 500	3
2013	75 500	1 074	2,5
2014	180 000	1 800	2–3 (estimation)
2015	170 000	1 590	2,3
2016	190 000	2 240	2,8
2017	175 000	1 732	2,5

NOTES   Based on data from http://szelektalok.hu/teszedd/, www.ewwr.eu/en/take _part/lets-clean-up-europe, www.kormany.hu, www.opsz.hu/teszedd-programleiras, www.unesco.hu/termeszettudomany/fenntarthato-fejlodesre/teszedd-orszagos.

In 2014 Hungary joined with its national program to the 'Let's Clean Up Europe' ('European Clean-Up Day') organised in all EU member countries. The head organiser is the European Committee's EWWR LIFE+ program, the European Week for Waste Reduction. Since 2014 Hungary has taken part in these two movements in May and September.

The organisers want to inspire people to get outdoors, get active and help clear up the rubbish that lies around us. The movement is growing year by year by the joining of people who have had enough of other people's litter and are willing to do something about it. The movement is also an excellent opportunity to develop a closer relationship between schools, kindergartens and families, but it is also a perfect team-building program for teams.

Table 4 illustrates the development of the program year by year. In 2014, when Hungary first joined to the 'Let's Clean Up Europe' program, the country alone (among all EU participant countries) fulfilled the collection of the amount of waste which the EU expected to be collected by all EU members in a four year period.

Joining to the program is easy: the volunteer can find the territorial coordinator person on the movement's website (http://szelektalok.hu/). After it he needs to register by choosing the nearest point to the volunteer location (find venue and date). Then the volunteer must go to the venue. On the spot, the coordinator and the other organisers provide all the equipment necessary including gloves, bags and best practices for collecting litter. Participants can join to the movement also collectively

e.g. from firms, public administration organisers and from the army, too.

The value of the work done by the volunteers is around 5 million euro per year. The number of the volunteers could be much more than that of the registered ones, because of the possibility to join randomly on the chosen venue. That is why the estimated number of the participants may be more by 30–40%.

The activity left a great impact on the community since they are already aware of cleaning their areas. Volunteering is a perfect way to participate in our community, meet people, and use the skills we have or learn new ones. It is also a great opportunity to try new challenges and connect with like-minded others.

Conclusion

The main aim of the paper was to show the literature overview of the environmental issues management and active citizenship and to introduce three Hungarian good cases about the practice. The method we used is broadly in line with the topic. We attempted to find out the dimensions and types of activities of environmental issue management. Our findings add to the growing body of literature on determining the types of activities in a direct and indirect way in four dimensions shown in this paper based on the concept of the authors. The good practices introduced by the authors can also be fitted in these dimensions.

The paper illustrated three cases in Hungary, the first case is a teaching method for young people, the school gardens. This case is not about solving a certain environmental issue, but is a good method to raise a generation who consciously deals with their environment, takes responsibility for their environment and for each other, learns to work together and to be creative, and by these as adults they will be able to become aware of those processes that require their participation. All in all, we stated that school gardens can be one of the main tools for educating active citizenship. In this process the Hungarian Foundation for School Gardens, the civil organisation introduced in this paper, plays an important role.

The case of Szentgotthárd is not only valuable as a success story, but it also illustrates well the issues of sustainability and development. The building of the incinerator could have solved a regional problem if we only examine one side. Because of its capacity, the destruction of huge amount of waste could have been handled successfully in an organised way. The plant promised workplaces, electricity-supply for the region free of charge, which creates very important advantages in economic opera-

tion and development. The growth of a system's capacity is useful as long as it is sustainable. If the 'by-product' of growth is destruction and demolition, development cannot be a need (Lányi 2012, 11).

The cooperation of local small communities is an important tool for ecological sustainability and environmental protection. Local cooperation induces global results. The domestic 'TeSzedd' program is a well-organised and successful action, but fortunately is not unparalleled. Local initiations have been growing everywhere all over the world, from Estonia to Egypt, from Kosovo to the United States. Globally millions of people join to waste collection actions, accomplishing a work valuing tens of millions of dollars or euros by country. In the global 'Let's do it!' movement 9 million people could be involved in 110 countries over 6 years (http://szelektalok.hu/globalis-szemetszedes/). It is a significant result, especially if we highlight that all these are based on individual responsible thinking and volunteering.

Results show that citizens can be active in shaping environmental issues but the most important factor seems to be that they need to be concerned personally about the issues. We think that the cases introduced in this paper are good ones as examples of environmental issue management and can contribute to the social participation and to active citizenship. In the future the knowledge about activities can be further extended and deepened by studying and analysing other cases and this knowledge can further develop both the theoretical basis and the possibilities of practical implementation.

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Modern Trends in Chinese Foreign Direct Investment in Africa: An OLI Approach

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This study evaluates the subtle differences that the various types of foreign direct investment (FDI) of China in Africa offers, as revealed by the data, using the 'Ownership, Location and Internalisation Advantages' OLI approach. Chinese FDI is analysed using source country comparisons, sectoral comparisons and an investigation of Chinese FDI practices. Data visualisation techniques and analyses infer similarities and differences between Chinese and other investors in Africa. These alternative methods are driven by the nature of the available data and its resulting statistical possibilities. The significance of this study is that it disambiguates the available data and compares along theory. Many stylised facts are assumed concerning Chinese FDI; this study, however, quantifies and tests these assumptions. The results show that China follows investment patterns of other investors, although heavily skewed towards oil, coal and gas, and other resource sectors. China otherwise tends to invest in medium growth, diversified economies, predominantly Nigeria and Egypt; except in Ethiopia where investment in communications dominates; Cameroon where chemicals dominate; Angola where investments in real estate outperform investment in the coal, oil and gas; and in South Africa and Tanzania that have a more even spread between sectors compared to the rest of the continent.

Introduction

The global economic expansion of China is growing in importance and is receiving more than its due share of attention, especially concerning trade and foreign direct investment (FDI) between China and other developing states. The global slowdown and structural change of the Chinese

economy have highlighted Africa's dependence on FDI as the steep decline in FDI is affecting Africa (UNCTAD 2013, 40). The landscape in FDI to Africa has changed significantly during the preceding decade, as India and China are becoming significant investors in the continent (see http://www.fdimarkets.com). Chinese FDI has, however, incurred severe criticism from the Organisation for Cooperation and Development members, as they interpret Chinese involvement as a re-colonisation of Africa with the pure aim of exploitation (Claassen, Loots, and Bezuidenhout 2012, 11583).

China's possible impact on Africa is one of the most contemporary debated topics, with Sino-African relations increasing in significance since 2000. The main hypothesis of the article is to evaluate whether Chinese FDI in Africa is only resource based or contains other aspects of the eclectic paradigm of Dunning (1980). This is done through source country comparisons, sectoral comparisons and an investigation of Chinese FDI practices. The methodology is based on data visualisation techniques and analyses are used to infer similarities and differences between Chinese investors and the theoretical 'Ownership, Location and Internalisation Advantages' – OLI criteria. This alternative method is driven by the nature of the available data and its resulting statistical possibilities.

Under the leadership of Chinese president, Xi Jinping, Chinese policy towards Africa has, however, changed towards a more cooperative and co-developmental focus (Buckley 2013). At a major policy speech in Dar es Salaam, Tanzania, in 2013, he confirmed that Chinese cooperation with Africa will be 'people to people' focused, where China will ensure that Africans benefit from the relationship.

The Economist (2013a), a long-time critic of Chinese FDI in Africa, also recently published an article on the changing nature of Chinese FDI in Africa and its possible positive benefits. In two separate articles, they highlighted the slowdown of the Chinese economy and the resulting slowdown in resource-seeking FDI in Africa. Furthermore, a shift in Chinese attitudes focuses on Africa as a place to do business rather than a place to merely acquire resources.

The Economist (2013b) also highlights changing African attitudes toward Chinese FDI and towards China. Africa is becoming more assertive and focused on harnessing benefits from FDI, while Africans are viewing China more and more as a competitor, or even a collaborator, rather than a supplier of aid.

This study aims to investigate Chinese FDI in Africa at a country and

sectoral level in order to gain a firmer understanding of the nature of Chinese FDI in Africa and to deduce conclusions on the possible effects thereof. The approach will be according to the eclectic FDI theory. Chinese FDI flows into Africa between 2003 and 2012 are examined with a view to verify the changing trends suggested. The significance of this study lies in the fact that it actually disambiguates the available data and compares it with theory. Many stylised facts are assumed concerning Chinese FDI; this study quantifies and tests these assumptions and evaluates the benefits sought by China from its FDI in Africa. The subtle differences that the various types of foreign direct investment (FDI) of China in Africa offer, which are revealed by the data, are also investigated.

FDI in Africa

The United Nations Conference on Trade and Development (UNCTAD) provides a thorough overview of basic FDI figures in Africa. FDI inflows to Africa were US$50 billion in 2012, although Africa still receives less than 5% of the global FDI. While FDI increased in North, East and Central Africa, West and Southern Africa saw declines (UNCTAD 2013, 40). All currency in this article is noted in US dollar.

The rates of return on investment in Africa have on average dropped substantially since 2008, to pre-2005 levels, while re-invested earnings from 2008 to 2012 have increased substantially (UNCTAD 2013, 33–4). This can be seen as the result of global economic movements and economic declines in the home country, especially the traditional partners of Europe and North America.

South Africa is listed among the top 20 prospects for FDI according to international standards of investment promotion (UNCTAD 2013, 23). It should be noted that many African countries are not on the list. The absence of African countries from the list is not surprising as the level of development in most African countries does not enable high levels of investment promotion facilitation in tandem with the negative image that the African countries hold globally.

Figures of 2011 and 2012 also predict a shift towards African consumers, and local manufacturing in Africa is moving towards FDI and away from the traditional investment in resource sectors (UNCTAD 2013, 40–2). This article will show that Chinese firms are orientating themselves strategically as development partners of African markets for future growth.

FDI inflows into Africa during the first decade of the third millennium (2003–2012) are illustrated in figure 1. After a significant growth phase
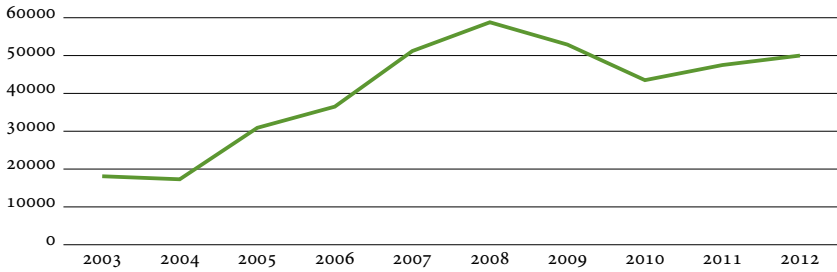
FIGURE 1　FDI Inflows into Africa 2003 to 2012 (million USD, based on data from
http://unctad.org)
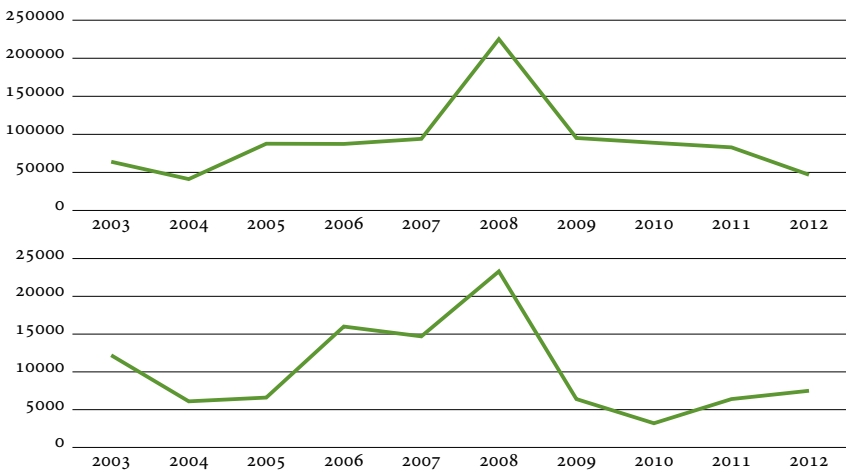
FIGURE 2　FDI into Africa 2003–2012: Greenfields (top) versus M&AS (bottom)
(million USD, based on data from http://www.fdimarkets.com and
https://zephyr2.bvdep.com)

from 2004 to 2008, there was a steep decline until 2010, after which a
slight recovery has occurred. The slight increase from 2011 to 2012 only
occurs due to merger and acquisition (M&A) activities, as Greenfields FDI
dropped to just above 2004 levels; where Greenfields FDI refer to new
business ventures (UNCTAD 2013, 40).

The trends in terms of mergers and acquisitions (M&A), as well as
Greenfields FDI are reflected in figure 2. The decline in Greenfields in
2012 as opposed to the increase of M&A activity from 2010 is highlighted
in the comparison.

Mergers and acquisitions form a relatively small percentage of FDI
in Africa of only 8% and are concentrated around the more developed
economies of Africa, such as South Africa and Egypt (Bezuidenhout,

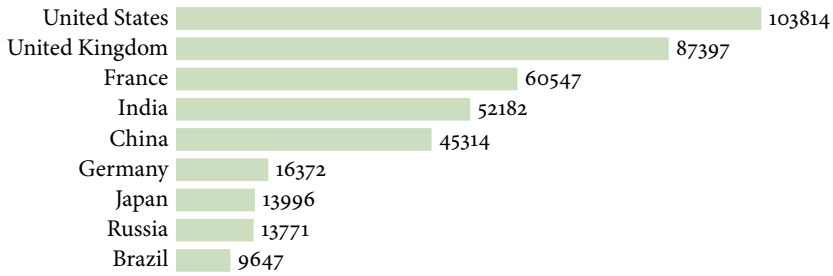|	
United States	103814
United Kingdom	87397
France	60547
India	52182
China	45314
Germany	16372
Japan	13996
Russia	13771
Brazil	9647

FIGURE 3   Major Source Countries for Greenfields FDI into Africa (million USD; based on data from http://www.fdimarkets.com)

Cloete, and Claassen 2014, 3). This study will therefore focus on Greenfield FDI, as Chinese FDI through M&AS was limited to only 11 deals during the period, according to Bureau van Dijk (see https://zephyr2 .bvdep.com).

A breakdown and comparison of the major investors in Africa between 2003 and 2012, indicating Greenfields FDI, are provided in figure 3. The United Arab Emirates, the largest investor in Africa, is omitted from this graph because they focus mostly on the real estate and oil sectors of the Middle East and North African (MENA) countries (see http://www.fdimarkets.com). The United States of America (USA) is by far the largest investor in Africa, followed by the historical colonial powers of the United Kingdom and France. FDIs from India and China have risen to the level where they are jointly the size of the USA, while that of countries such as Brazil and Russia have grown to equal Japan and Germany. UNCTAD (2013, 40) also highlights the growth of FDI by developing African economies.

Considering the relative size of Greenfields FDI to recipient countries in Africa, the MENA countries form a distinctive group as opposed to the varied pattern across Sub-Saharan Africa (SSA). In SSA, four groupings can be discerned, namely Nigeria, South Africa and Angola as the largest recipients of FDI, Ghana and Mozambique as the second tier, the East African cluster of Uganda, Kenya and Tanzania and lastly, the rest of the SSA countries.

The breakdown of Greenfields FDI in Africa by sector from 2003 to 2012 compared to the inflows from 2008 to 2012 is provided in table 1. Notably, most sectors remain at their relative size to the others. There is also a severe skewedness toward FDI in the real estate, metals and coal, oil and natural gas sectors that is highlighted by the large percentage share

TABLE 1   Recipient Sectors for Greenfields FDI into Africa (US$ million)

Sector	FDI by sector (2003–2012)		FDI inflow (2008–2012)	
	(1)	(2)	(1)	(2)
Coal, oil and natural gas	366,027.91	41.3	210,116.25	40.3
Real estate	168,459.36	19.0	96,668.79	18.6
Metals	117,955.53	13.3	60,603.05	11.6
Communications	44,219.19	5.0	30,821.03	5.9
Chemicals	29,437.56	3.3	17,599.27	3.4
Hotels & tourism	28,367.20	3.2	13,931.40	2.7
Alternative/renewable energy	23,680.55	2.7	19,233.41	3.7
Food & tobacco	17,842.04	2.0	13,070.48	2.5
Building & construction materials	17,377.18	2.0	12,092.63	2.3
Automotive OEM	13,682.80	1.5	9,015.69	1.7
Transportation	12,039.36	1.4	6,066.86	1.2
Financial services	10,651.01	1.2	7,103.14	1.4
Warehousing & storage	6,574.50	0.7	2,746.60	0.5
Business services	6,283.82	0.7	4,094.17	0.8
Leisure & entertainment	6,183.80	0.7	5,629.10	1.1
Software & IT services	5,485.00	0.6	3,956.40	0.8
Minerals	4,333.14	0.5	2,297.10	0.4
Beverages	4,235.87	0.5	3,119.39	0.6
Paper, printing & packaging	3,852.72	0.4	2,854.62	0.5
Total	886688.54	100.0	521,019.38	100.0

NOTES   Based on data from http://www.fdimarkets.com.

of the sectors. This gives rise to the speculation about resource exploitation by multinationals (MNES) in Africa at the expense of local development.

Chinese FDI in Africa

After joining the WTO in 2001, China officially allowed private foreign investment in FDI projects with its 'open door' policy (Claassen, Loots, and Bezuidenhout 2012, 11583). The Ministry of Commerce (see http://english.mofcom.gov.cn) in China is the custodian of Chinese FDI data. Their most recent official figures indicate that US$2.52 billion of Chinese FDI flowed to Africa during 2012, with a total Chinese FDI stock
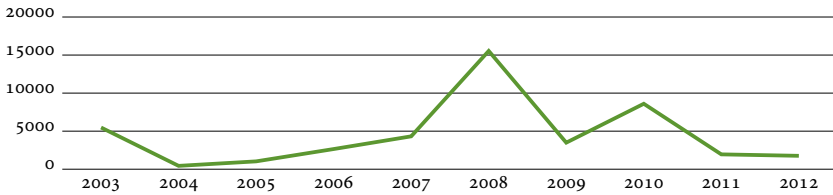
FIGURE 4   Chinese Greenfields FDI in Africa (million USD, based on data from
http://www.fdimarkets.com)

in Africa of US$21.23 billion. It estimates that approximately 2 000 Chinese firms are active in 50 African countries.

These figures contradict the figures of the fDi Markets database and that of Bureau van Dijk as they only show Chinese firms being active in 27 African countries through FDI (see http://www.heritage.org). This discrepancy is explained by the Chinese Ministry of Commerce (see http://english.mofcom.gov.cn) using all foreign investment as standard, while fDi Markets use the international standard as set by the Organisation for Cooperation and Development benchmark definition of FDI, which requires a minimum 10% stake or direct management voice (Organisation for Cooperation and Development 2008). Resultantly, to adhere to international standards, the fDi Markets database is utilised as a source in this study as it also allows for comparison between countries and recorded deals are independently verifiable.

As shown in figure 3, China has risen to become a prominent investor in Africa. According to figure 4, Chinese FDI in Africa generally follows the overall trend as was shown in figure 2. The similarity in the pattern between the total FDI inflows and Chinese FDI is reflected by the smoother increase between 2004 and 2007, a spike in 2008 and a smaller spike in 2010. According to FDI Markets (http://www.fdimarkets.com), 2012 saw US$1 764 million total Greenfields FDI in Africa and a total Chinese Greenfields FDI of US$45 313 million. Greenfields FDI makes up more than 95% of Chinese FDI in Africa (see http://www.fdimarkets.com and https://zephyr2.bvdep.com).

A snapshot of the destination countries for Chinese Greenfields FDI in Africa is provided in figure 6. Nigeria, Angola and Algeria are the major recipients of Chinese FDI. It is noteworthy that FDI in Angola primarily went into the real estate sector and not the coal, oil and natural gas sector, as one would expect, as is the case with Algeria and Nigeria.

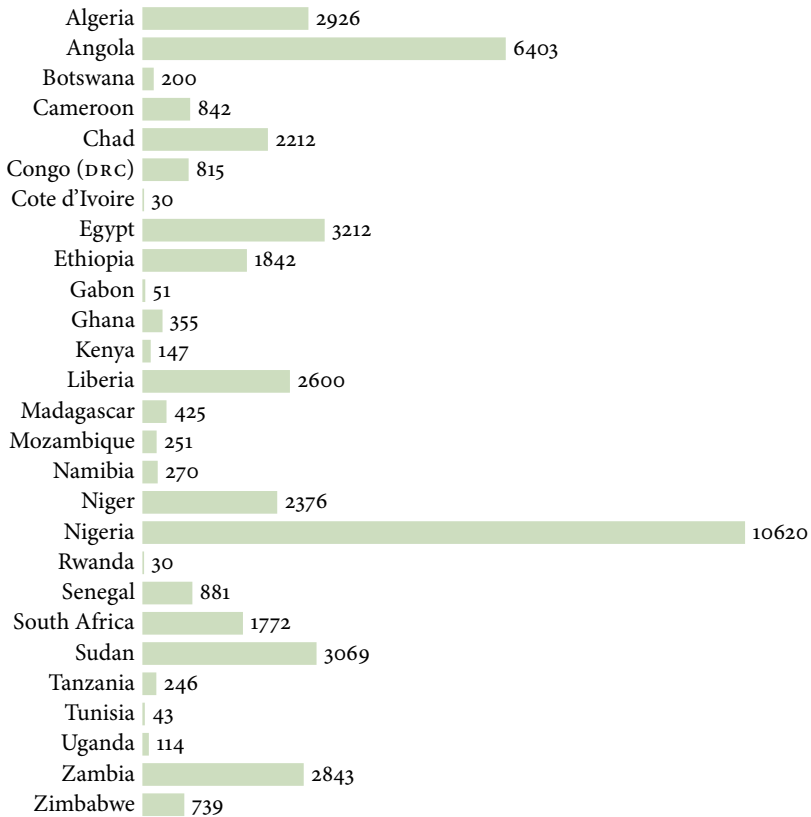Furthermore, the research results indicate that South Africa and Kenya

Country	FDI (million USD)
Algeria	2926
Angola	6403
Botswana	200
Cameroon	842
Chad	2212
Congo (DRC)	815
Cote d'Ivoire	30
Egypt	3212
Ethiopia	1842
Gabon	51
Ghana	355
Kenya	147
Liberia	2600
Madagascar	425
Mozambique	251
Namibia	270
Niger	2376
Nigeria	10620
Rwanda	30
Senegal	881
South Africa	1772
Sudan	3069
Tanzania	246
Tunisia	43
Uganda	114
Zambia	2843
Zimbabwe	739

FIGURE 5   Chinese Greenfields FDI in Africa, Destination Countries (million USD, based on data from http://www.fdimarkets.com)

are the only countries that receive a high percentage of diverse sectoral investments (noting to 'Greenfields FDI'). Also noteworthy is the dominance of the communications sector in Ethiopia, as well as chemicals in Tanzania and Cameroon. Overall, there is a strong dominance of the resource sectors and real estate.

Literature Review

In order to investigate Chinese FDI in Africa critically, this study links with the 'Ownership, Location and Internalisation Advantages Model,' known as the OLI model of Dunning (1980, 9), which focuses on ownership, location and internalisation advantages (OLI). This model was invented by Dunning in the 1980s and has been widely used as foundation theory in FDI studies ever since. The eclectic paradigm or OLI frame-

work was first developed by Dunning (1980) in his study 'Towards an Eclectic Theory of International Production: Some Empirical Tests.' Using the eclectic paradigm and its subsequent determinants, FDI can be categorised and the behaviour of multinational enterprises (MNES) can be evaluated (Blonigen 2005, 383). MNE activities can be investigated along the OLI categories and a definitive argument can be made about their investment focus, as well as the theoretical impact the FDI will have on the recipient economies.

The first level of the OLI model categorises FDI according to the advantages gained by multinational enterprise (MNE) investing in a foreign market. These include ownership, location and internalisation advantages (Dunning and Lundan 2008). *Ownership advantages* reflect on the comparative advantage of the firm. If it has a greater comparative advantage, it will invest. *Location advantages* focus on the gains of comparative advantages through acquiring resources and market position. *Internalisation advantages* are the advantages gained using own production and internal specialisation (Dunning and Lundan 2008).

From an MNE perspective, Dunning (1981) groups these advantages according to 'OLI' as follows: (1) Firms that have ownership of firm-specific assets, which will determine whether it will be advantageous for them to invest; (2) firms that have a location advantage and will only invest if it is more cost efficient for the firm to exploit firm-specific assets abroad rather than only in the home country; and (3) firms that will also have an internalisation advantage and it must be more advantageous for the firm to use its assets internally rather than contracting with other firms in the host country.

UNCTAD (2000) and subsequent work by Dunning and Lundan (2008) further interpret MNE FDI motives as the result of the four categories based on the original OLI model. 'Market-seeking FDI' occurs when an MNE wants to expand the consumer market for its product (goods and/or services) to new consumers. 'Resource-seeking FDI' focuses on the acquisition of resources or access to resources. These include natural resources and production inputs, such as production materials and labour (Slaughter 2002). 'Strategic-asset-seeking FDI' is the result of the MNES' mandate to create shareholder wealth by acquiring tangible or intangible assets to enhance its strategic comparative advantage. These include technologies and intellectual property, as well as regional headquarters (Krueger and Strauss 2014). 'Efficiency-seeking FDI' seeks to enhance firm productivity through cost minimisation or economies of scale in

TABLE 2   Typology of FDI and Incentives

Resource-seeking	Market-seeking	Strat. asset-seeking	Efficiency-seeking
Location of: natural resources, raw materials low-skilled labour, agglomeration benefits	*Market potential:* market dimensions, income per capita, customer-specific preferences, kind of goods and services to be provided	*Acquiring strategic assets:* brands and market positioning, expertise, technology, distribution networks, human capital	*Lower costs:* mostly export oriented, availability of skills at low costs, close to markets, low relocation costs
Low response to both tax and non-tax incentives	Low response to both tax and non-tax incentives	Low response to both tax and non-tax incentives	High response to tax and non-tax incentives
FDI drivers based on other factors than incentives	All firms need to be treated equally	FDI driven by location	Affects firms' competitive edge

NOTES   Based on James (2013).

global production networks (GPNS). It can also be described as the rationalising of the firm's production structure or organisational structure (Sachwald 2005).

A typology of FDI, differentiating between tax and non-tax incentives to MNES by James (2013), is provided in table 2. This allows for a more in-depth assessment of the four FDI categories, namely resource-seeking, market-seeking, strategic asset-seeking and efficiency-seeking. His analysis is based on responses by MNES to these incentives by increased FDI. Although this study does not focus on incentives, the typology provides a significant overview of the four FDI categories.

UNCTAD (2010) and Krueger and Strauss (2014) provide a further synthesis of the determinants of FDI according to the OLI theory. Added are categories that influence FDI as a whole, but handle the different categories in different manners. These variables relate to policy frameworks and business facilitation. Table 3 provides an overview of the policy framework and the business facilitation variables. The area of business facilitation is highly relevant for efficiency-seeking FDI, as is seen in table 2.

They also provide a more concrete way of studying the FDI categories in terms of economic variables. An overview of the economic variables, which form the determinants of FDI, is provided in table 4.

When it comes to the effects of FDI in each of the four categories, there is a great difference in results and opinions. The OLI paradigm focuses

TABLE 3   FDI: Policy and Facilitation Variables

Policy framework for FDI	Business facilitation
Economic, political and social stability; Rules regarding entry and operations; Standards of treatment of foreign operations; Policies on functioning and structure of markets (esp. competition, M&A; and corporate governance); Privatisation policy; Trade policy (tariffs and NTBS) and coherence of FDI and trade policies; Tax policy; Good governance; Protection of property rights (including intellectual property); Industrial and regional policies; development of competitive clusters; Stable exchange rates.	Investment promotion (incl. image building, actions to reduce information asymmetries); Investment incentives (e.g. fiscal, financial and regulatory); Technical services, including: hassle costs (e.g. related to corruption and administrative efficiency), social amenities (e.g. bilingual schools and quality of life), after-investment services, and services to centralise procedures and information.

NOTES   Adapted from Vale Columbia Center on Sustainable International Investment (2013).

mainly on value added and more productive chains, knowledge and skills spillovers, changing consumer behaviour, enhanced good governance, infrastructure development and economic growth (Dunning and Lundan 2008, 319).

Although most authors focus on the benefits of FDI for developing countries, the positive effects are directly linked to policies and institutions to facilitate the linkages and spillovers (Kosack and Tobin 2006, 205). Receiving FDI is not a guarantee for actual economic benefit; careful planning and responsible governance are required to materialise these gains.

In the following section, the available data as determinants, as well as the limitation on analysis placed by the data, will be discussed.

Data and Limitations

Data for Chinese FDI in Africa are not regularly accessible. The Financial Time's fDi Markets database for Greenfields FDI is used in this study as a source of sector-specific Chinese FDI in African countries. The data covered by the Financial Times database is compiled from FDI deals between 2003 and 2012 for all African countries.

The main limitations of using the fDi Markets database are that some deals are not recorded due to a specific lack of information and subsequently cannot be compared to FDI figures published by UNCTAD, the World Bank and the International Monetary Fund (IMF). However, the data published by them are recipient country totals that do not break

TABLE 4   The Determinants of FDI

Resource-seeking	Market-seeking	Strat. asset-seeking	Efficiency-seeking
Access to raw materials; Access to natural resources; Access to low-skilled labour	Market size ; Per capita income; Market growth; Access to regional and global markets; Country-specific consumer preferences; Structure of markets	Access to skilled labour; Access to new competitive advantages; Technological and other created assets; Availability of and access to strategic infrastructure	Cost of resources and assets listed under resource- or asset-seeking; Other input costs, i.e. transportation and communication costs; Costs of other intermediate products; Membership of a regional integration agreement; Low-cost unskilled or skilled labour; Different comparative advantages of countries; Better deployment of global resources

NOTES   Adapted from Vale Columbia Center on Sustainable International Investment (2013).

down to sector level or source country information. Lastly, it should be noted that not all countries received Chinese FDI, not all received FDI annually and not all received FDI into every sector. The vast majority of deals are in the coal, oil and natural gas and metals sectors.

These limitations limit the application of econometric techniques, as the short sample period and irregular investment intervals per country and sector (which generates missing values) will render the time series sample size too small for satisfactory analysis. A base investigation was therefore conducted, based on a graphical analysis to establish a basis for future analysis, as more data becomes available that will satisfy the statistical requirements.

Data on Chinese investment in 27 African countries for the decade 2003 to 2012 were used. It is worth noting that, after 2008, only Rwanda, Gabon and Tanzania, of these, did not receive any Chinese FDI.

A comparison of the destination countries and sectors of Greenfields Chinese FDI in Africa is made in figure 6. Only South Africa and Egypt received highly diverse investments, and the coal, oil and natural gas as well as the communications sectors are the only sectors
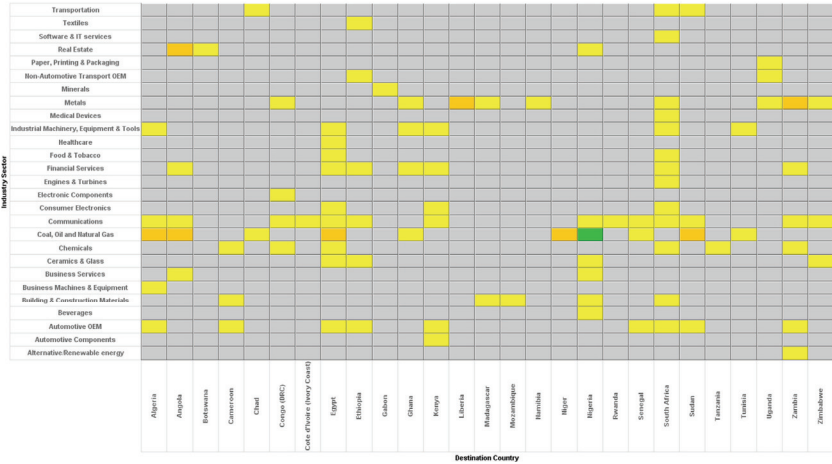
FIGURE 6   Overview of Chinese Greenfields FDI in Africa 2003 to 2012 by Host
Country and Sector (based on data from http://www.fdimarkets.com)

that have a wide dispersion in terms of destination countries. For determinant comparisons, the World Bank Development Indicators (see http://data.worldbank.org) were used, as well as the United Nations Development Program (UNDP) Human Development Index (HDI) (see http://hdr.undp.org). It should be noted that World Bank data are not equally available for the destination countries and as a result the latest available values were always used. In cases where averages are used, averages over the sample period 2003 to 2012 were taken.

The Research Methodology and Empirical Results

This study investigates Chinese Greenfields FDIS in terms of country and sectoral comparisons and Chinese FDI practices. Data visualisation techniques and analyses are used to infer similarities and differences between Chinese and other investors in Africa. This method was chosen for the special information statistical possibilities it may yield and because of data restrictions. The detail on the graphs of this analysis might not be very clear in this format of the journal, but the aim is to infer and indicate general trends.

In order to disambiguate Chinese FDI in Africa, each of the four OLI categories were investigated in terms of the major determinants listed in the literature. The exception to this is resource-seeking FDI. Total FDI and the total FDI minus resource sectors are used. FDI minus resource

sectors focuses on the FDI that is not resource based to evaluate it against the OLI criteria. If it shows OLI behaviour it shows that Chinese FDI is not only resource seeking, but also follows OLI behaviour. Only the strongest relationship in each category was reported, although the general trend is the same for all sets in that the same relationship can be seen between the two.

The following section discusses the research findings in terms of resource-seeking, market-seeking, efficiency-seeking and strategic asset-seeking FDI.

RESOURCE SEEKING

In this category, the total FDI inflows from 2003 to 2012 were compared to the total FDI inflows from 2003 to 2012 minus the major resource sectors of coal, oil and natural gas, metals, minerals and tobacco and food. Logically, if FDI in countries is non-resource seeking, they should rank much higher in the rankings than with the resources included. Similarly, if the FDI focus was solely resource driven, they should have had a steep decline in the rankings.

The results of total Greenfields FDI compared to the total FDI minus the resource sectors are listed in table 5. Liberia, Niger, Namibia, Sudan, Senegal and Gabon all show steep declines leading to the conclusion that the focus in these countries is mainly resource seeking. Ghana is on the borderline, but is still considered mainly resource driven.

In contrast, Ethiopia, South Africa, Cameroon, Mozambique, Cote d'Ivoire, Rwanda, Zimbabwe, Tanzania, Botswana and Kenya all show steep increases in the ranking, implying that the focus in these countries is mainly non-resource driven. Observations made are therefore confirmed, especially in the case of Ethiopia, Cameroon, South Africa, Tanzania and Kenya.

The rest of the countries all remain approximately at the same level in the rankings. Noteworthy are Nigeria, Angola, Algeria (the oil countries) and the Democratic Republic of Congo (DRC), all known to be highly priced in resource-seeking FDI regions. This implies that these countries receive a relatively broader spectrum of FDI as indicated in figure 6.

The comparison between total FDI and agricultural land yields a positive relationship, as illustrated in figure 7. This confirms the findings of Claassen, Loots, and Bezuidenhout (2012) and suggests that Chinese firms are pursuing investments in future Chinese food security. The results are summarised in table 6 and discussed below. In summary, it can

TABLE 5   Chinese Greenfields FDI in Africa: Country Ranking with and without Resource Sectors

(1)	(2)	(3)	(4)	(5)
Nigeria	Angola	Congo (DRC) (+3)	Ethiopia (+9)	Liberia (−20)
Angola	Ethiopia	Tunisia (+2)	South Africa (+7)	Niger (−20)
Egypt	Nigeria	Angola (+1)	Cameroon (+7)	Namibia (−10)
Sudan	South Africa	Algeria (+1)	Mozambique (+7)	Sudan (−9)
Algeria	Cameroon	Zambia (+1)	Cote d'Ivoire (+7)	Senegal (−6)
Zambia	Egypt	Uganda (+1)	Rwanda (+7)	Gabon (−5)
Liberia	Algeria	Madagascar (=)	Zimbabwe (+6)	Ghana (−4)
Niger	Zambia	Chad (−1)	Tanzania (+6)	
Chad	Zimbabwe	Nigeria (−2)	Botswana (+6)	
Ethiopia	Chad	Egypt (−3)	Kenya (+5)	
South Africa	Congo (DRC)			
Senegal	Mozambique			
Cameroon	Sudan			
Congo (DRC)	Tanzania			
Zimbabwe	Botswana			
Madagascar	Madagascar			
Ghana	Kenya			
Namibia	Senegal			
Mozambique	Cote d'Ivoire			
Tanzania	Rwanda			
Botswana	Ghana			
Kenya	Uganda			
Uganda	Tunisia			
Gabon				
Tunisia				
Cote d'Ivoire				
Rwanda				

NOTES   Column headings are as follows: (1) total FDI, (2) FDI without resource sectors, (3) small differences, (4) large positive difference, (5) large negative difference. Based on data from http://www.fdimarkets.com.

be concluded that, although there is a strong focus on resource-seeking FDI by Chinese firms, there is also a strong tendency towards a more diverse reasoning in their investments. The findings on the Greenfields FDIs minus resources in terms of three benefit seeking categories analysed against certain criteria are discussed in table 6.
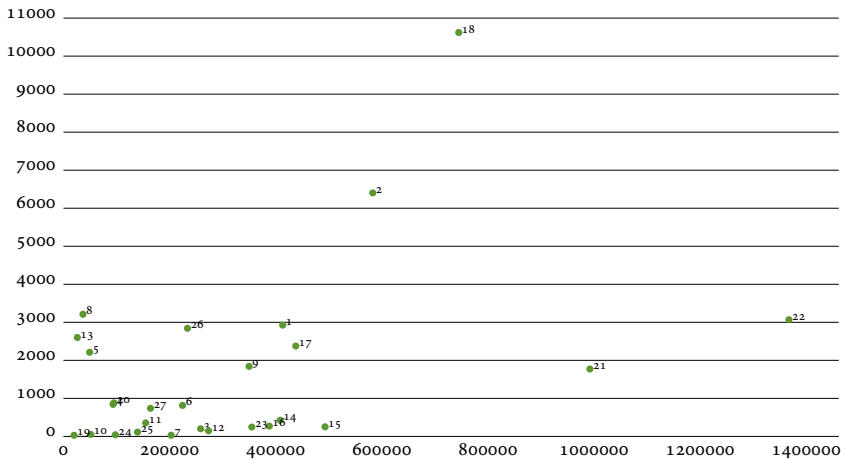
FIGURE 7   Comparison of Total FDI (ordinate, million USD) and Agricultural Land
(abscissa, km²) (based on data from http://www.fdimarkets.com and
http://data.worldbank.org)

NOTES   (1) Algeria, (2) Angola, (3) Botswana, (4) Cameroon, (5) Chad, (6) Congo
(DRC), (7) Cote d'Ivoire, (8) Egypt, (9) Ethiopia, (10) Gabon, (11) Ghana, (12) Kenya, (13)
Liberia, (14) Madagascar, (15) Mozambique, (16) Namibia, (17) Niger, (18) Nigeria, (19)
Rwanda, (20) Senegal, (21) South Africa, (22) Sudan, (23) Tanzania, (24) Tunisia, (25)
Uganda, (26) Zambia, (27) Zimbabwe.

MARKET SEEKING

Market-seeking FDI is assessed by comparing FDI inflows with market
size, per capita income, market growth and trade connectedness. Both
total FDI and total FDI minus the resource sectors were evaluated. To-
tal FDI minus resource sectors was reported, unless the FDI total is sig-
nificantly more positive. The results are summarised in Table 6. When
market size, as a factor of market seeking, is considered as the difference
between total FDI and resources plus total population of the recipient
countries, there seems to be a strong positive relationship between these
variables, except in the case of Angola. There is also a strong positive re-
lationship between total FDI minus the resource sectors, and per capita
production and income (GDP) of the recipient countries. Here the only
exceptions are in the case of a few outliers, such as Angola and Equa-
torial Guinea. The results of a comparison between total FDI minus the
resource sectors and the average GDP growth for the recipient countries
indicated that there is a positive relationship between Chinese FDI and

TABLE 6   OLI comparison of Chinese Greenfields FDI Minus Resource Sectors
          in Africa

Criteria	(1)	(2)	(3)
Total population	Strong positive		
GDP per capita	Positive	Positive	Positive
Average GDP growth	Positive	Positive	
Logistics performance index	Positive	Positive	Positive
Ease of doing business	Strong Positive	Strong positive	
Labour force		Strong positive	
Liner shipping connect. index		No sig. relation	No sig. relation
Mobile cellular subscription	Positive	Positive	Positive
Human development index	Positive	Positive	Positive

NOTES   Column headings are as follows: (1) market seeking, (2) efficiency seeking, (3)
strategic asset seeking. Based on data from http://www.fdimarkets.com.

economies with high economic growth. Connectedness and trade were
tested using the Logistics Performance Index (LPI) and an indicator of
the ease of cost-effective shipping. A comparison between total FDI mi-
nus the resource sectors and the Logistics Performance Index (LPI) for
the recipient countries revealed that although the overall LPI Index does
not have any significant relationship, the ease of arranging cost-effective
shipping does show a positive relationship. This indicates a mixture of
efficiency-seeking and market-seeking FDI.

The major recipients of Chinese FDI is provided in table 5. The re-
sult does indicate a preference for 'gateway' countries, as Nigeria, Ghana,
Ethiopia, Kenya, Egypt and South Africa that are all respectively viewed
as the dominant countries in the respective regions of Africa.

Combining market size, market income, market growth, logistics and
regional gateways provides a picture of a strong market orientation in
Chinese FDI, which is not resource focused. This supports UNCTAD's
assertion of a change in FDI behaviour towards the African consumer
and shows that Chinese firms are strategically placing themselves in the
African market for future business and growth. The following section re-
ports on the empirical findings about efficiency seeking.

EFFICIENCY SEEKING

To test for efficiency-seeking FDI, the focus shifts to the costs involved
in business and labour. Country-by-country data are nearly impossible

to obtain for most countries and the focus was therefore on comparing total FDI and total FDI minus resource sectors with the World Bank Doing Business Index and the available labour force. The research results on efficiency seeking are also summarised in Table 6.

The individual relationships mirror most of the market-seeking relationships. For most of these relationships, the total FDI also shows a slightly better positive relationship than when the resource sectors are omitted. This suggests that even resource-seeking FDI has an efficiency-seeking component. Chinese firms will therefore rather invest in more efficient business environments than in more inefficient ones.

With the exception of Angola, there is a strong positive relationship between the size of the labour force and Chinese FDI. Total FDI minus resource sectors also provides stronger positive results than total FDI. This implies that the quality of the labour force is a strong consideration for Chinese firms.

The Liner Shipping Connectivity Index (LSCI) was also compared with total FDI minus the resource sector's yields. This comparison is done in order to further the results of the Logistics Performance Index (LPI) in the market-seeking FDI section. The relationship in this case is a much stronger positive relationship. This indicates that seeking efficiency is the main consideration in terms of trade connectedness.

In both total FDI and total FDI minus resource sectors, Chinese firms show a consistent behaviour of seeking efficient cost-saving FDI. The following section reports on the findings concerning strategic asset seeking.

STRATEGIC ASSET SEEKING

Strategic asset-seeking FDI is a more difficult category to test for on a macro-level, especially without firm-specific information. Mobile cellular connections given in Table 6 were used as a proxy to test for technology investment and connectedness, while the quality of life and skilled labour requirements were evaluated using the UNDP's HDI. The HDI also provided more information and background as a proxy for the availability of technology and the absorptive capacity of it by the country. The results of the LPI and LSCI also confirm that port infrastructure has a significant role to play.

When mobile cellular subscription was compared with the total FDI minus the resource sectors, the results show a strong positive trend in the relationship. The implication is that there is a strong correlation between Chinese FDI and the availability of technology in recipient countries, as

indicated in Table 6. Under strategic asset-seeking FDI, the HDI was also tested to confirm whether the preference is towards more skilled or unskilled labour, and the results show a preference for better skilled labour markets.

When the Human Development Index (HDI) is compared to the total FDI minus the resource sector, the results revealed that, except for Angola, there is a general strong positive relationship between the variables. Chinese firms therefore prefer investing in countries with a higher quality of life, skilled labour and the availability of technology.

When it comes to Chinese FDI in Africa, excluding resources, there is a specific strong positive relationship with the determinants of strategic asset-seeking FDI. The following section summarises the research results of this study.

Summary of Results

This study differs from previous studies on the topic in that it investigated Chinese investment (FDI) in African countries quantitatively, considering the available data. It disambiguates the available data and made a unique contribution to the existing knowledge base, as it confirmed some stylised fact on Chinese FDI in Africa, while contradicting others, generating interesting and informative results

This study revealed that China is mostly following investment patterns of other investors, although heavily skewed towards oil, coal and gas, as well as other resource sectors. China otherwise tends to invest in medium growth, diversified economies, predominantly in Nigeria and Egypt. A specific exception is Ethiopia, where investment in communications dominates; Cameroon, where chemicals dominate; Angola, where Chinese investment in the coal oil and gas sector was outperformed by the real estate investments; and South Africa and Tanzania that have a more even spread between sectors than the rest of the continent.

Although there is a strong tendency towards resource-seeking FDI by Chinese firms, it can be concluded that there is also a strong tendency for more diverse reasoning in the investments, while a focus on food security is also confirmed.

Combining market size, market income, market growth, logistics and regional gateways indicates a strong market-seeking orientation in Chinese FDI that is not resource focused. This supports UNCTAD's assertion that a change in FDI behaviour towards the African consumer is in progress and that Chinese firms are positioning themselves strategi-

cally in African markets for future business and growth. In both total FDI and total FDI minus resource sectors, Chines firms show a consistent behavioural tendency of seeking efficient cost-saving FDI. Ease of doing business, total labour force and the Liner Shipping Connectivity Index (LSCI) all show significant positive relationships with Chinese FDI. This confirms a local manufacturing element in all sectors, which is not only extraction based.

When Chinese FDI in Africa, excluding resources, is considered, there is a strong positive relationship with the determinants of strategic asset-seeking FDI. Chinese firms invest more in countries with a higher quality of living, skilled labour and available technology.

Conclusion

This study analysed Chinese FDI in Africa based on the OLI framework of 'Ownership, Location and Internalisation Advantages.' Differentiating Chines FDI into the categories determined by FDI literature enables an understanding of the nature and reasoning behind the investment decisions of Chinese firms. This is especially important in light of continuing criticism in Western media regarding the motivation for Chinese investments in Africa as a new form of colonialism and exploitation.

Chinese FDI also shows strong elements of market-seeking, efficiency-seeking and strategic asset-seeking behaviour. It was shown that Chinese FDI in Africa follows global trends and, from a theoretical perspective, has a much broader scope than the sceptics focus on. Although a strong resource-seeking focus exists among Chinese FDI, very few countries experience only resource-seeking FDI. Elements of food security and long-term food production can also be verified.

Africa is set to reap the benefits of the developmental loans and infrastructure development along with the growth elements of FDI and its spillover effects. The focus on market-seeking, efficiency-seeking and strategic asset-seeking FDI will also transfer technologies and will lead to skill and productivity increases as well as a growing consumer base. If African countries manage this process well, to allow for competition and crowding in of local firms, Chinese FDI will make a great contribution towards the transformation of the economic landscape of Africa.

Chinese investment in Africa can therefore be seen as a long-term-oriented economic presence. Chinese investment is also linked to inexpensive developmental loans and infrastructure development projects. The implication is that China is creating a future market for its products

and its brands with a very long-term horizon. China has become a major player in FDI in Africa. They will remain a dominant force and may eventually even become the most dominant force.

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Ali je zdravstveno varstvo potreba ali luksuzna dobrina? Analiza panelnih podatkov na primeru držav članic Zdravstvene mreže Jugovzhodne Evrope
Saša Obradović in Nemanja Lojanica

Glavni cilj tega prispevka je proučiti potencialno povezavo med gospodarsko rastjo in izdatki za zdravstvo v državah članicah Zdravstvene mreže Jugovzhodne Evrope v obdobju 1995–2014 z uporabo panelne ekonometrije. Pristop testiranja panelne kointegracije in vektorski model korekcije napak se uporabljata za raziskovanje dolgoročne in kratkoročne vzročne povezave med gospodarsko rastjo, izdatki za zdravstvo in pričakovano življenjsko dobo (trivariatni model). Empirični rezultati kažejo dolgoročno razmerje med opazovanimi spremenljivkami. Potrjeno je, da je zdravje dolgoročno luksuzna dobrina, kratkoročno pa potreba. Ob koncu je potrebno opozorilo, da bi morala biti gospodarska politika v teh državah usmerjena v ciljno povečanje izdatkov za zdravstveno varstvo z namenom povečanja splošne gospodarske dejavnosti. Tudi ekonomska politika bi morala biti usmerjena v ustrezno kombinacijo javnega in zasebnega financiranja v zdravstvu.

Odkrivanje kitajskih proizvodnih strategij za vzpodbujanje odnosa in namere: vključevanje inovacij, države porekla in znanja
Ramadania, Rianti Ardana Reswari in Endang Dhamayantie

Globalizacija širi možnosti izbire s pomočjo tehnologije, ki zagotavlja dovolj različnih informacij. Podjetja se tako na domači, kot na mednarodni ravni soočajo s konkurenco, ki je bolj intenzivna kot v obdobju pred globalizacijo. Kitajske blagovne znamke so v tujini vse bolj priljubljene in si prizadevajo tekmovati z drugimi svetovnimi blagovnimi znamkami. Globalni potrošniki nenehno iščejo najnovejše proizvode z najnižjo ceno na trgu. To iskanje usmerja znanje in pozornost na kitajske blagovne znamke. Namen te raziskave je raziskati vpliv novih izdelkov, države izvora in poznavanja izdelkov na nakupno namero glede na blagovno znamko. Za pridobitev podatkov so bili stotim anketirancem izročeni vprašalniki zaprtega tipa. Podatki so bili nato preračunani

z uporabo Smart pls 3.2.7. Rezultati so pokazali, da se mora podjetje – da bi ustvarilo ugodnejši odnos do blagovne znamke - osredotočiti na prizadevanja za ustvarjanje spomina kupcev glede specifikacij izdelkov.

Ključne besede: inovativnost izdelkov, država porekla, poznavanje izdelkov, odnos do blagovne znamke, nakupni namen
Klasifikacija jel: m3, o3
Managing Global Transitions 16 (3): 215–234

Makroekonomske posledice depreciacije menjalnih tečajev: nigerijska izkušnja
Ekundayo P. Mesagan, Olorunfemi Y. Alimi in Ismaila A. Yusuf

Ta študija preučuje makroekonomske posledice depreciacije menjalnega tečaja v Nigeriji. Za podatke, ki zajemajo obdobje 1970–2015, je uporabljen kointegracijski pristop za testiranje avtoregresivnih porazdeljenih zamikov. Empirični rezultati potrjujejo, da depreciacija naira pozitivno in opazno vpliva na vse kazalnike makroekonomske uspešnosti, razen na proizvodnjo na prebivalca, ki je zanemarljiva. To pomeni, da depreciacija naira vzpodbuja trgovinsko bilanco, nestabilnost cen in povečuje obrestno mero. Depreciacija valute torej ne koristi gospodarstvu države. Poleg tega študija potrjuje, da obstaja dolgoročna povezava med depreciacijo menjalnih tečajev in makroekonomskimi rezultati v Nigeriji. Trgovinska in izvozna diverzifikacija sta potrebni za ohranitev dobičkov, povezanih z gibanji menjalnih tečajev in blaženje njihovih negativnih učinkov na gospodarstvo.

Ključne besede: depreciacija valute, proizvodnja, stopnja inflacije, obrestna mera, trgovinska bilanca
Klasifikacija jel: b22, e31, e43, f31, o40
Managing Global Transitions 16 (3): 235–258

Različni načini, na katere aktivni državljani rešujejo okoljska vprašanja: študije primerov iz Madžarske
Adrienn Reisinger in Katalin Bándy

Prispevek prikazuje, kako lahko aktivni državljani rešujejo okoljska vprašanja s sodelovanjem v lokalnih ali nacionalnih programih ali pri dogodkih. Po eni strani je namen prispevka predstaviti teorijo družbene vključenosti aktivnih državljanov s poudarkom na okoljskih vprašanjih. Po drugi strani pa gre za poskus predstaviti temo s pomočjo treh dobrih primerov iz Madžarske, ki temeljijo na drugotnih informacijah in intervjujih. Prvi je program šolskih vrtov; v Szentgotthárdu gre za vprašanje

načrtovane sežigalnice, ki je bila pred nekaj leti prepovedana zaradi dejavnosti lokalnih civilnih organizacij. Tretji program, t. i. Te Szedd (program zbiranja smeti v organizirani kampanji na Madžarskem), pa kaže pristop od zgoraj navzdol, ki ga upravljajo lokalni prebivalci. Rezultati kažejo, da so državljani lahko dejavni pri oblikovanju okoljskih vprašanj, vendar se zdi najpomembneje to, da se za tovrstna vprašanja tudi osebno zavzamejo.

Ključne besede: aktivni državljani, družbena vključenost, okoljska vprašanja, upravljanje, dobri primeri
Klasifikacija JEL: R11, L31
Managing Global Transitions 16 (3): 259–277

Sodobni trendi v kitajskih neposrednih tujih naložbah v Afriki: pristop na temelju lastništva, lokacije in internalizacije
Henri Bezuidenhout in Ewert P. J. Kleynhans

Ta študija ocenjuje razlike, ki jih različne vrste neposrednih tujih naložb Kitajske v Afriki ponujajo, kot kažejo podatki, z uporabo pristopa 'lastništva, lokacije in internalizacije.' Kitajske neposredne tuje naložbe so analizirane s pomočjo primerjav z izvornimi državami, sektorskih primerjav in raziskav kitajskih praks s področja neposrednih tujih naložb. Tehnike vizualizacije podatkov in analize kažejo podobnosti in razlike med kitajskimi in drugimi vlagatelji v Afriki. Te alternativne metode temeljijo na naravi razpoložljivih podatkov in statističnih možnostih, ki iz tega izhajajo. Študija je pomembna, saj razkriva razpoložljive podatke in primerja teorije. Kitajskih neposrednih tujih naložb se drži slab sloves prirejanja podatkov; študija te predpostavke količinsko opredeli in preveri. Rezultati kažejo, da Kitajska sledi naložbenim vzorcem drugih vlagateljev, čeprav je močno usmerjena proti naftnemu, premogovnemu in plinskemu sektorju ter sektorjem drugih virov. Kitajska sicer najpogosteje vlaga v srednjo rast, raznolika gospodarstva, predvsem v Nigeriji in Egiptu - v Etiopiji prevladujejo naložbe v komunikacije, v Kamerunu naložbe v kemikalije, v Angoli naložbe v nepremičnine, ki presegajo naložbe v premog, nafto in plin – ter v Južni Afriki in Tanzaniji, ki imata bolj enakomerno razporeditev med sektorji v primerjavi s preostalim delom celine.

Ključne besede: neposredne tuje naložbe, Afrika, Kitajska, pristop na temelju lastništva, lokacije in internalizacije, eklektična paradigma
Klasifikacija JEL: F20, F21, F23
Managing Global Transitions 16 (3): 279–300