“Currency redenomination and firm value growth: Lessons from a developing economy”

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CURRENCY REDENOMINATION AND FIRM VALUE GROWTH: LESSONS FROM A DEVELOPING ECONOMY

Abstract

The redenomination of the Cedi with the new Ghana Cedi in 2007 was met with skepticism and outright opposition in certain sectors of the economy. Businesses feared that this would decrease their net worth. Despite the time that has elapsed since the redenomination exercise, it is yet to be proven whether the fears of individuals who predicted its negative impact on firms' performance had been confirmed or the optimism of those that expected its positive impact on firms' performance has prevailed. Therefore, the study examined the impact of the cedi redenomination on firms' value growth in Ghana. The study used the financial records of listed firms in Ghana, five years before and five years after the redenomination of the currency. The firms' value growth was measured based on the growth in Tobin's Q and return on assets (ROA). A generalized method of moments (GMM) estimation technique was adopted for the regression analysis. The results indicated that the firms' value increased, whilst profitability decreased in the same year. Moreover, the results showed sustained growth in the profitability of firms after the redenomination exercise. The study concludes that the currency redenomination improved the firms' profitability, whilst their value was not improved. The significant implication of the results is that governments can use redenomination as a tool to influence micro-economic activities. This study is perhaps the first to use firm-level data to examine the impact of currency redenomination on firms' value growth in an African country.

Keywords profitability, economic growth, Tobin's Q, return on assets, Cedi, Ghana

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INTRODUCTION

Given that many developing countries are experiencing high inflation and deterioration of their currency value against other currencies, engaging in currency redenomination is often a likely response, as was the case in Ghana. Previously, the Ghanaian payment system was primarily cash-based, which placed tremendous physical pressure on the currency, resulting in their early mutilation. Due to the low value of the Ghanaian currency, the Cedi, simple transactions involved large bundles of notes, which exposed business and individuals to robbery and theft risks. Moreover, firms suffered from this payment system because of the high cost of handling large sums of money. Thus, in 2007, the government redenominated its currency, where four zeros were dropped from the prevailing currency. This exercise pegged the new currency to 0.9 cedis against a dollar. The introduction of the new Ghana cedi faced oppositions and criticisms from some individuals and institutions, creating much controversy between government and the citizens (Opare-Henaku et al., 2013). Others feared that it would trigger inflation, resulting in reducing firms' values (Obuobi et al., 2020).

These uncertainties towards the currency redenomination was grounded on the adverse effects of the demonetization exercise in the 1970s, which resulted in the loss of confidence in the currency and consequently reduced firms' value (DoCoMo & Mensah, 2008). Because of this, citizens feared that the currency redenomination exercise undertaken in 2007 would again decrease their net worth (Boubou et al., 2020). Concerns were justified due to examples of failed currency redenomination exercises globally, especially in developing countries such as Afghanistan, Uganda, Zimbabwe, Argentina, and Zambia (Mosley, 2005; DoCoMo & Mensah, 2008). These studies maintain that a lack of attention to a currency redenomination effects can result in a loss to firm value in the short, medium, or long term. However, there is evidence of successful currency redenomination in Turkey, Ukraine, Poland, Russia, and Romania. Other studies, such as those of Pambudi et al. (2014), Ponto and Tasik (2017), Baeti et al. (2018) and Gunadi et al. (2018), also provide evidence to show that currency redenomination increases the firms' value and the economy as a whole. The studies discussed above provided conflicting results on the impact of currency redenomination on the value of firms. However, it is clear that currency redenomination has an impact on the performance of firms.

More than a decade has passed since the Ghanaian currency redenomination, and the fears of individuals who predicted its negative impact on firms' performance have not yet been confirmed. Unfortunately, no study has been conducted to determine the impact of the Ghanaian currency redenomination on firm value. Hence, the study aimed to investigate the impact of the currency redenomination on the value of firms in Ghana. The contribution of this study is threefold. Firstly, Ghana's government can utilize the results to guide future redenomination decisions, considering the vast amounts of money spent on redenominating its currency. Secondly, other developing countries planning to redenominate their currency can learn from Ghana and reap the full benefit of currency redenomination. Lastly, West African countries have proposed using a single currency called Eco by 2024. The results of this study can help firms in West Africa prepare to maximize the benefits of the new currency.

1. LITERATURE REVIEW

1.1. The concept of currency redenomination

Currency redenomination is defined differently by different authors. Astrini et al. (2016) view currency redenomination as a process of replacing an old unit of money with a new one according to a specific ration. This is achieved by moving some decimals to the left or removing some zeros from the old currency. Currency redenomination is also a phenomenon where a country changes its currency units because of currency devaluation or substantial depreciation (Obuobi et al., 2020). These authors further explained that currency redenomination generally entails removing some zeros from the old currency. These definitions suggest that currency redenomination is a tool employed by a country's government to achieve some economic targets. This may include correcting some perceived lack of alignment in the currency and price structure and improving the local currency's confidence and credibility.

Though currency redenomination involves removing zeros from existing currencies, there are some instances where currency redenomination involves adding some zeros to currencies. Priyono (2013) maintains that currency redenomination also includes the addition of zeros to a particular country's currency. Examples of such redenomination activities include Nigeria (1973), Malawi (1971), Gambia (1971), Fiji (1969), New Zealand (1967), Australia (1966), Ghana (1965), Sierra Leone (1964) and South Africa (1961). Foo (2019) explained that the addition of zeros to a currency is not redenomination; it is instead called decimalization. Decimalization is achieved by converting a currency from traditional denomination to a decimal system, mostly by a factor of 100.

Unlike revaluation or devaluation, currency redenomination does not change the value or worth of a currency (Prabawani & Prihatini, 2014; Charlie, 2019). In this context, currency redenomination does not translate to a change in the purchasing power of a currency. There is a long history behind currency revaluation, which dates back to the 19th

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century (Charlie, 2019). During this period, governments experienced shortages in gold and silver, which were the main instruments used for a transaction. To mitigate the scarcity of gold and silver, the governments sometimes adjusted the value of their coins. In the strictest sense, this activity cannot be classified as currency redenomination. The classical currency revaluation occurred in the 1920s when the German government redenominated its currency (Temin, 2008; Young, 2020). During the period, Germany experienced hyperinflation. The government redenominated its currency to maintain its currency that was spiralling down in value (Hamlin, 2019).

In recent years, many countries have employed redenomination to tackle some economic imbalances and other reasons. The primary reason for revaluation is to control inflation, and recently as a qualification for joining a monetary union (Handayani, 2020; Ifunanya, 2020). Generally, the redenomination is carried out for economic and political reasons. An example is the case of Afghanistan that employed revaluation as an instrument to help it break through from economic recession occasions by many years of the civil war (Samuel et al., 2018; Priyono & Putri, 2019). Other benefits of currency revaluation include shaping financial transactions, decreasing transaction cost, reducing the risk of handling money, improvement in money management, and changing spending habits of the citizens (Mosley, 2005; Foo, 2019).

1.2. The historical background of the redenomination of the Ghana Cedi

The official currency in Ghana is the Cedi, which is further decimated into pesewas where one hundred Pesewas equal one Cedi. The Ghanaian currency derived its name from an Akan (an indigenous Ghanaian language) word called 'sedie', which means a cowry shell (Bank of Ghana, 2020). Ghanaians commenced using Cedi as the main currency on July 19th, 1965, eight years after it obtained independence from Great Britain. Prior to this period, the pound, shillings and pence were the main currency in Ghana. The main reason for using the Cedi was politically inclined: to reflect the full independence from Great Britain's colonial rule and reflect Ghana's republican status (Tankebe, 2008). Furthermore, Ghana needed to part ways with the British colonial monetary system and embraced the decimal system, which had gained popularity during the period. The first cedi notes issued were in the denomination of 1, 5, 10, 50, 100 and 1,000 (Bank of Ghana, 2020). There were also coins that were also denominated in 5, 10, 25 and 50 Pesewas.

In 1967, Ghana redenominated its currency with a new currency called the new Cedi, replacing the old currency at the rate of 1.20 old cedi to 1.00 new cedi. The reason for the redenomination was political (Djokoto et al., 2013). This year was a year after the overthrow of Ghana's first president, Dr Kwame Nkrumah by a military government. The old Cedi bore his image, hence the change in the currency to remove his images from the currencies (Obuobi et al., 2020). In 1979, the Government of Ghana further ordered for the demonetization of the currency, which replaced the old currency with a new currency at a discount of 30% for sums of money, not more than 5000 cedis and 50% for amounts exceeding 5,000 cedis. This demonetization exercise pegged the Cedi again the dollar at the ratio of 1:0.23 (Bank of Ghana, 2020). During this period, Ghana experienced hyperinflation; therefore, the government used the demonetization exercise as an instrument to reduce excessive cash holdings in the non-banking public.

Ghana's currency was further devalued in 1980, partly because of the Structural Adjustment Programmes introduced by the International Monetary Fund. The last redenomination occurred on July 1st, 2007, resulting in introducing a third cedi, which was worth 10,000 of the second Cedi. This shows that the purchasing power of the second and third Cedi remained the same. The exercise did not result in the currency's devaluation; instead, it was a redenomination. The old and new currencies were used concurrently until December 31st, 2007, to withdraw the old currency from the system during this period systematically. The reason being that the redenomination was to facilitate ease of transaction, reduce transaction cost, reduce risk of holding cash and impose confidence in the currency (Opare-Henaku et al., 2013). The expectation was that the concomitant effect of this redenomination exercise would result in the improvement in the performance of firms in the economy.

1.3. Empirical literature review

Currency redenomination predates the 20th century. However, there is a dearth of empirical studies to estimate its impact on business. The majority of the studies on the impact of currency redenomination have been limited to the macro level, where the focus has been on inflation, prices, interest rates, and the country's gross domestic product. Few studies concentrated on the impact of currency redenomination on microeconomic variables. Given the dearth of empirical studies on the impact of currency redenomination on the performance of firms, this study commences the review by examining literature on the impact of currency redenomination on macroeconomic parameters. One such study is that of Suhendra and Hanayani (2012) who investigated the impact of currency redenomination on economic growth, exchange rate, inflation, and export value in 27 countries involved in currency redenomination. The authors employed independent sample t-test to establish that currency redenomination significantly influences both the country's inflation and economic growth. This result indicates that currency redenomination can be employed as a tool to improve a country's fiscal performance.

Prabawani and Prihatini (2014) also contributed to this subject matter by documenting that currency redenomination has an impact on the macro parameters such as economic growth and inflation in Indonesia. Astrinil et al. (2016) also examined the impact of redenomination on the microeconomic variables such as price, volume and value of transactions. The authors adopted experimental methods to establish that redenomination had no influence on prices and economic transactions in a country. Likewise, a recent study by Baeti et al. (2018) examined the relationship between currency redenomination and economic performance in Indonesia, establishing that economic growth in Indonesia decreased after the currency redenomination. The authors further reported that variables such as unemployment rate, economic growth rate and democratization level of a country influence the success of a redenomination activity. In a similar notion, Pambudi et al. (2014) documented that inflation decreases with redenomination activity.

It can be observed that the previous studies focused on Asian economies. In this regard, Obuobi et al. (2020) estimated the impact of the currency redenomination on the Ghanaian economy. The study examined whether the currency redenomination exercise affected the economy, using the 2007 economic indicators as the benchmark. The researchers demonstrated that the redenomination exercise had a positive impact on the Ghanaian economy. Apart from Obuobi et al. (2020), no other study on this subject matter exists in Africa because few countries have engaged in currency redenomination in recent times. The preceding discussion shows that governments can employ currency redenomination activity to influence macroeconomic variables such as inflation, economic growth and productivity. These findings indicate that countries can engage currency redenomination to influence their macroeconomic variables. However, the caveat is that the currency redenomination is used to solve or manage economic challenges (Prabawani & Prihatini, 2014; Astrinil et al., 2016; Baeti et al., 2018; Pambudi et al., 2014). Hence, a country that does not experience economic challenges may not find currency redenomination useful. The second category of the impact of currency redenomination concentrates on firm-level variables.

To explain how currency redenomination influences individual behaviors, Purwana et al. (2012) proved that individual spending increased after a currency redenomination activity in Indonesia. In a related study, Prabawan (2017) investigated the potential impacts of currency redenomination on Indonesian firms. The authors sampled the views of 161 business owners and managers from a variety of industries and established redenomination facilitated a simpler recording of financial transactions and encouraged more dynamic business. The study concluded that the currency redenomination in Indonesia increased the productivity and profitability of firms. This finding conflicts with Al and Ozyurt's (2008) (as cited in Suhendra & Handayani, 2012) views that the currency redenomination in Turkey did not have any significant impact on the citizens' economic expectations.

In Turkey, Gunadi et al. (2018) investigated the impact of the Turkish lira's redenomination on the financial performance of manufacturing firms. Using statistical techniques such as Wilcoxon and

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Mann-Whitney U tests, the authors found that the redenomination exercise did not significantly improve the firms' performance, instead, it decreased the firms' profitability in the year of the redenomination, whilst sales increased. Priyo and Putri (2019) conducted a study of firms in Indonesia, confirming that currency redenomination facilitates efficient processing of transactions and increases productivity. This finding implies that currency redenomination results in efficiency and improves the profitability of firms.

It is evident from the preceding discussion that the previous studies have focused on macro-economic variables. These studies also concentrated on the factors that influence a successful redenomination exercise. The potential impact of the currency redenomination from companies and businesses has not been given the needed attention. In this vein, this study attempts to contribute to this area by investigating the impact of the Ghanaian currency (cedi) redenomination on the value and profitability of firms listed on the Ghana Stock Exchange (GSE).

2. METHODOLOGY

The population of the study consisted of firms listed on the Ghana Stock Exchange (GSE) from 2002 to 2012. This period consisted of five years before the redenomination exercise and five years after redenomination. Considering that the aim of the study was to investigate the impact of the redenomination exercise on the value of the listed firms, an equal number of years prior to and after redenomination was deemed appropriate. Thirty-one firms were listed on the GSE during this period. Additional criteria were adopted to determine the sample size. First, firms had to have at least three years of data and be listed on the GSE before the currency redenomination and three years of data after redenomination. Given these criteria, five (5) firms were excluded. This resulted in the use of twenty-six (26) firms for the analysis. Data were obtained from the annual reports of the firms downloaded from their respective websites. In addition, other financial data were obtained from databases such as Bloomberg and McGregor BFA. Following the selection criteria, 260 firm-year observations were targeted. However, missing data resulted in the use of 243 firm-year observations.

2.1. Regression model specification

A panel data analysis was used to estimate the impact of currency (Cedi) redenomination on the value growth of firms in Ghana. Multiple regression analysis was then adopted to estimate the link between the currency redenomination and the firms' value growth. The estimation technique adopted for the regression was a dynamic model based on a generalized method of moments (GMM). Following the examples of Gunadi et al. (2018) and Baeti et al. (2018), the following estimation models were developed.

$$\begin{aligned} TQG_{i,t} &= \beta_0 + \beta_1 TQG_{i,t-1} + \beta_2 Y_5 CR_{i,t-5} + \\ &+ \beta_3 Y_4 CR_{i,t-4} + \beta_4 Y_3 CR_{i,t-3} + \beta_5 Y_2 CR_{i,t-2} + \\ &+ \beta_6 Y_1 CR_{i,t-1} + \beta_7 Y_0 CR_{i,t} + \beta_8 Y_1 CR_{i,t+1} + \\ &+ \beta_9 Y_2 CR_{i,t+2} + \beta_{10} Y_3 CR_{i,t+3} + \beta_{11} Y_4 CR_{i,t+4} + \\ &+ \beta_{12} Y_5 CR_{i,t+5} + \beta_{13} Size_{i,t} + \beta_{14} Lev_{i,t} + \varepsilon_{i,t} \ , \end{aligned} \quad (1)$$

$$\begin{aligned} ROAG_{i,t} &= \beta_0 + \beta_1 ROAG_{i,t-1} + \beta_2 Y_5 CR_{i,t-5} + \\ &+ \beta_3 Y_4 CR_{i,t-4} + \beta_4 Y_3 CR_{i,t-3} + \beta_5 Y_2 CR_{i,t-2} + \\ &+ \beta_6 Y_1 CR_{i,t-1} + \beta_7 Y_0 CR_{i,t} + \beta_8 Y_1 CR_{i,t+1} + \\ &+ \beta_9 Y_2 CR_{i,t+2} + \beta_{10} Y_3 CR_{i,t+3} + \beta_{11} Y_4 CR_{i,t+4} + \\ &+ \beta_{12} Y_5 CR_{i,t+5} + \beta_{13} Size_{i,t} + \beta_{14} Lev_{i,t} + \varepsilon_{i,t} \ , \end{aligned} \quad (2)$$

where i and t represent firm i at time t, $TQG_{i,t}$ denotes Tobin's Q growth (proxy for growth in firms value) of firm i at time t, $ROAG_{i,t}$ signifies return on asset growth (proxy for growth in firms profitability) of firm i at time t. Y_0 signifies the year dummy for the year of the currency redenomination. The variables $Y_5CR_{i,t-5}$, $Y_4CR_{i,t-4}$, $Y_3CR_{i,t-3}$, $Y_2CR_{i,t-2}$, and $Y_1CR_{i,t-1}$ are the year dummies that represent 5, 4, 3, 2 and 1 years before the redenomination, respectively. In addition, $Y_5CR_{i,t+1}$, $Y_4CR_{i,t+2}$, $Y_3CR_{i,t+3}$, $Y_2CR_{i,t+4}$, and $Y_1CR_{i,t+5}$ are the dummy variables that respectively denotes 1, 2, 3, 4, and 5 years after the currency (Cedi) redenomination. These dummy variables were included in the model to examine the firms' value growth five years before and five years after the currency redenomination. $Size_{i,t}$ and $Lev_{i,t}$ represent the size (natural logarithm of total assets) and leverage (ratio of long term liabilities to total equity) of firm i at time t.

3. RESULTS AND DISCUSSION

3.1. Descriptive statistics

Table 1 provides summary statistics for the estimation variables.

The results show that the average growth rate in the firms' value (*TQG*) was 26.83%, indicating that the firms generally increased their value over the study period. However, with a respective maximum and minimum values of 61.82% and –27.94%, this suggests that all the firms did not record growth in their value during the period. The average growth in the return on assets (*ROAG*) of the firms was also 7.07%, indicating a marginal growth in the firms' profitability during the period. Once again, the glaring difference between the maximum (58.37%) and minimum (–30.19%) in ROAG amplifies a dispersion in the firms' profitability growth, an indication that not all firms were profitable. The results also show that the average size of the firms was USD 25.49 million. This result shows that the firms had relatively large assets size, notwithstanding some having as low as USD 0.061 million asset value. Concerning the firms' leverage, the average value was 83.61%, suggesting that the firms were not highly geared.

Table 2 presents the results of the correlation between the variables, an identifier of the presence or absence of multicollinearity among the independent variables. It is acknowledged that the presence of multicollinearity can negatively affect the estimation results. The results show no multicollinearity problem, since the correlation coefficients among all the variables are less than 0.60, which is less than the threshold of 0.75 embraced by researchers.

3.2. Regression results

Tables 3 and 4 present the results of the impact of currency redenomination on the value growth of listed firms in Ghana. The tables present the coefficients and the t-statistics (in parenthesis) of the variables. Asterisks are used to indicate the level of significance of the variables. Each table shows the results according to four different estimation techniques, comprising pooled ordinary least square (POLS), fixed effect (FE), random effect (RE) and GMM. These different estimation techniques were employed to assess the consistency and robustness of the results. The results from the two tables show that the signs of the coefficients of the variables based on the different estimation techniques are similar. This means that the results are consistent and robust. Hence, from this point forth, the results were analyzed and discussed based on the GMM results. GMM is accepted as a superior estimation technique that produces consistent, reliable and robust results, since it is a dynamic estimation model that accounts for the various problems inherent in static models such as endogeneity and heteroscedasticity.

Table 3 presents the results of the impact of currency redenomination on firms' value growth, where growth in Tobin's Q is used to measure firms' value growth.

Table 1. Summary statistics

	Observations	Mean	SD	Maximum	Minimum
TQG (%)	243	26.83	0.4268	61.82	–27.94
ROAG (%)	243	7.07	0.7882	58.37	–30.19
Size (USD million)	243	25.49	1.5738	137.82	0.061
Lev (%)	243	83.61	17.27	163.75	3.308

Table 2. Correlation matrix and VIF results

	TQG	ROAG	Size	Lev
TQG (%)	1.0000			
ROAG (%)	0.3824**	1.0000		
Size (USD million)	0.2795*	0.4829	1.0000	
Lev (%)	–0.1382**	0.0836*	0.5739***	1.0000

Note: *** – significant at 1%, ** – significant at 5%, and * – significant at 10%.

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Table 3. The impact of currency redenomination on firms' value growth (Tobin's Q)

Value	POLS	FE	RE	GMM
Constant	0.0384**	0.1937***	0.1338***	0.4937***
	(1.9884)	(3.683)	(4.974)	(4.287)
$TQG_{i,t-1}$	–	–	–	0.0628**
				(2.0326)
$Y_5CR_{i,t-5}$	0.3834*	0.2028**	0.1742	0.1093*
	(1.7858)	(1.9752)	(1.1273)	(1.8429)
$Y_4CR_{i,t-4}$	0.2245**	0.1973**	0.0382**	0.3447*
	(2.2081)	(2.3268)	(1.9908)	(1.8342)
$Y_3CR_{i,t-3}$	0.1647**	0.3972*	0.0937*	0.2147**
	(2.3279)	(1.8241)	(1.9322)	(2.0314)
$Y_2CR_{i,t-2}$	0.1853*	0.1318**	0.0738*	0.1773**
	(1.8754)	(1.9805)	(1.7791)	(1.2107)
$Y_1CR_{i,t-1}$	0.2596**	0.2947**	0.2792***	0.1927**
	(1.9729)	(2.083)	(4.397)	(3.124)
$Y_1CR_{i,t}$	0.2068*	0.1138	0.0383	0572**
	(1.7886)	(1.282)	(1.1941)	(1.4037)
$Y_1CR_{i,t+1}$	–0.4397**	–0.1638*	–0.0937**	–0.2949**
	(4.372)	(5.839)	(3.682)	(7.0381)
$Y_2CR_{i,t+2}$	0.1681**	0.1928***	0.0827**	0.1529
	(1.9935)	(4.6291)	(2.102)	(2.3738)
$Y_3CR_{i,t+3}$	0.3084**	0.2903**	0.0913***	0.2803**
	(1.9837)	(2.2739)	(3.8857)	(1.1325)
$Y_4CR_{i,t+4}$	0.2787**	0.1637*	0.3983**	0.1172***
	(2.3008)	(1.7934)	(2.1303)	(1.2638)
$Y_5CR_{i,t+5}$	0.4066*	0.2826**	0.1037	0.2936
	(1.8205)	(1.9611)	(1.0563)	(1.4837)
$Size_{i,t}$	0.2843*	0.4873	0.1892**	0.3832
	(1.8522)	(1.2847)	(1.9669)	(1.1947)
$Lev_{i,t}$	0.2965	0.1194**	0.0872*	0.1401
	(1.4683)	(1.9752)	(1.8381)	(0.8447)
Observations	243	243	243	235
R-squared	0.7136	0.6852	0.6154	–
Number of ID	–	27	27	27
Number of instruments	–	–	–	18
AR2	–	–	–	0.5784
Hansen J-Stat	–	–	–	0.6403
Prob > F/Wald Prob > chi2	0.0000	0.0000	0.0000	0.0000

Note: *** – significant at 1%, ** – significant at 5%, and * – significant at 10%.

Table 3 shows that the lagged Tobin's Q ($TQG_{i,t-1}$) variable has a positive and significant ($p < 0.05$) relationship with the prevailing Tobin's Q ($TQG_{i,t}$). This result suggests that previous growth in the value of firms is a significant predictor of firms' value. The results show that there was positive and insignificant growth in the value of the firms five ($Y_5CR_{i,t-5}$) and four ($Y_4CR_{i,t-4}$) years before the currency redenomination (Ghana cedi). However, the firms recorded a significant ($p < 0.05$) growth in value in the third ($Y_3CR_{i,t-3}$), second ($Y_2CR_{i,t-2}$) and one year ($Y_1CR_{i,t-1}$) before the year (2007) of the currency redenomination. This shows that the firms recorded a sustained significant value growth (Tobin's Q) in their value in the last three years before the currency's redenomination. Regarding the year of the redenomination ($Y_0CR_{i,t}$), the results show that the firms obtained a significant ($p < 0.05$) growth in their value. This result demonstrates that the firms were on a positive and significant growth trajectory before the redenomination exercise.

Table 3 presents the coefficients of $Y_1CR_{i,t+1}$, $Y_2CR_{i,t+2}$, $Y_3CR_{i,t+3}$, $Y_4CR_{i,t+4}$, and $Y_5CR_{i,t+5}$, which shows the direction and significance of the growth of the firms' value from year 1 to 5 after the currency redenomination. The result indicates that the coefficient of $Y_1CR_{i,t+1}$ is negative and significant at 0.05, suggesting that the value (Tobin's Q) of the firms eroded in the first year after the redenomination exercise. The coefficient of $Y_2CR_{i,t+2}$ is also positive and insignificant, suggesting that the growth in the firms' value (Tobin's Q) did not significantly improve the second year after the redenomination of the Ghanaian Cedi. These results coincide with the 2008 financial crises. During this period, the confidence of investors ebbed, thereby eroding the value of many firms. Coupled with the extra administrative and operational cost associated with the redenomination exercise, it is not surprising that the firms' value did not improve in the year of the renomination and one year after. This explanation is consistent with the findings of Gunadi et al. (2018) who documented that currency redenomination decreased the profitability and value of the firms in the redenomination year, whilst sales increased.

However, the growth rate was insignificant ($p > 0.05$), which indicates that, even though the value of the firms increased in the second year after the currency redenomination, the rate of growth in value (Tobin's Q) was not substantial. This result evinces an appreciation in the firms' value, albeit insignificant in the second year after the redenomination exercise. The results presented in Table 3 further indicate that in the third ($Y_3CR_{i,t+3}$) and fourth ($Y_4CR_{i,t+4}$) years after the

currency (Ghanaian cedi) redenomination, there was a positive and significant ($p < 0.05$) growth in the value of the firms. These results demonstrate that the firms could significantly increase their shareholders' wealth in the third and fourth years after the currency redenomination. Finally, the result shows that the coefficient of $Y_5CR_{i,t+5}$ is positive but insignificant ($p > 05$), which demonstrates that in the fifth year ($Y_5CR_{i,t+5}$) after the currency redenomination exercise, the firms' value increased insignificantly.

These results show a sporadic growth in the firms' value after the redenomination exercise. Compared to the period preceding the redenomination exercise, it can be noted that the value of the firms did not improve after the redenomination exercise. The value of the firms improved significantly in the preceding three years to the redenomination exercise. These results provide evidence that the Ghanaian currency (Cedi) redenomination did improve the value of the listed firms in the country. This result is surprising because some of the reasons for the redenomination of the currency were to reduce the risk of carrying and handling money, increase confidence in the currency and the economy, and reduce the cost of operating firms. As Priyo and Putri (2019) articulate, these were expected to improve investors' confidence in the country resulting in further investment in the economy, thereby increasing firms' value. Though these results are surprising, it can be explained in the following ways. First, the cedi redenomination coincided with the financial crises in 2008. The financial crises negatively affect the value of firms worldwide, of which Ghana was not an exception. Therefore, the currency redenomination could not neutralize or reverse the adverse effects of the global financial crises.

Besides, the government's intention of the currency redenomination could not be well-articulated to investors. They might have misinterpreted it as panic action by the government to save the perceived sinking economy; hence they stayed away. Another reason is that the investors were sceptical about how the currency redenomination would impact their wealth. As a result, they adopted the 'wait and see' attitude in the first five years after the currency redenomination exercise to appropriately gauge its impact on the economy. This may be the reason why the value of the firms could not increase substantially in the medium term. These findings are in harmony with the views of Al and Ozyurt (2008) (as cited in Suhendra & Handayani, 2012), who reported the currency redenomination in Turkey did not have any significant impact on the economic expectations of the citizens and firms. On the other hand, the findings of the study conflict with the results of previous studies such as those of Prabawan (2017), Gunadi et al. (2018) and Priyo and Putri (2019) who provided evidence to show that currency redenomination improves the financial performance of firms.

Concerning the coefficient of the size ($Size_{i,t}$) of the firms, the result shows that it is positive and insignificant ($p > 0.05$). This result shows that the firms' size did not have an impact on their value creation/growth. Similarly, the coefficient of Leverage ($Lev_{i,t}$) is negative and significant, an indication that the leverage of the firms did not influence their value growth.

The robustness of the estimation model and the results were tested by the deployment of both Hansen's *J*-test and second-order correlation (AR2) test. Table 3 shows that the p-value of the Hansen's *J*-test result is insignificant, implying that the number of instruments used in the model does not have any adverse effect on the estimators. The *p*-value of the AR2 is also insignificant, which shows that the model does not suffer from autocorrelation problems. This emphasizes that the results from the estimation model are reliable and robust. These results show that the variations in the explanatory variables significantly explain the value growth (Tobin's Q) of firms.

Table 4 presents the results of the impact of currency redenomination on firms' profitability growth where the growth in return on assets is used as a measure of firms' financial performance

Table 4 shows a positive and significant ($p < 0.01$) relationship between the lagged growth in ROA ($ROAG_{i,t-1}$) and current ROA ($ROAG_{i,t}$), an indication that previous growth in firms' ROA is a significant predictor of profitability performance. The coefficients of $Y_5CR_{i,t-5}$, $Y_4CR_{i,t-4}$, $Y_3CR_{i,t-3}$, $Y_2CR_{i,t-2}$, and $Y_1CR_{i,t-1}$ denote the direction and significance of growth in ROA of the firms from year 5 to 1 pri-

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Table 4. The impact of currency redenomination on firms' profitability growth (ROA)

	POLS	FE	RE	GMM
Constant	0.5745**	0.2639***	0.4862***	0.2237***
	(2.4015)	(4.7657)	(5.8072)	(4.1396)
$TQG_{i,t-1}$	–	–	–	0.1274***
				(6.1377)
$Y_5CR_{i,t-5}$	0.0475**	0.2454*	0.1579*	0.2573*
	(2.308)	(1.8362)	(1.7905)	(1.8588)
$Y_4CR_{i,t-4}$	0.1885**	0.0957***	0.3184***	0.0765**
	(2.2014)	(4.805)	(5.1398)	(1.9942)
$Y_3CR_{i,t-3}$	0.2268*	0.1786**	0.3217*	0.2645*
	(1.8178)	(2.2984)	(1.7855)	(1.8376)
$Y_2CR_{i,t-2}$	0.0925***	0.1638*	0.3677**	0.0672*
	(4.6062)	(1.8306)	(1.9862)	(2.2817)
$Y_1CR_{i,t-1}$	0.0945**	0.2146***	0.1406***	0.2164**
	(2.1847)	(4.6812)	(3.8743)	(2.3694)
$Y_1CR_{i,t}$	–0.1473*	–0.2168**	–0.3716**	–0.1168**
	(–1.7953)	(–1.9982)	(–2.3957)	(–2.1831)
$Y_1CR_{i,t+1}$	0.0775*	0.3784*	0.1383**	0.2944
	(1.8105)	(1.7843)	(1.9788)	(1.1794)
$Y_2CR_{i,t+2}$	0.1748**	0.2781*	0.1475	0.3135**
	(1.9842)	(1.8744)	(1.4831)	(2.1427)
$Y_3CR_{i,t+3}$	0.3894*	0.1995**	0.0854***	0.1854**
	(1.8271)	(2.3207)	(5.8269)	(2.2475)
$Y_4CR_{i,t+4}$	0.1004**	0.1843***	0.0584**	0.0966***
	(2.0395)	(4.7842)	(1.9829)	(4.3821)
$Y_5CR_{i,t+5}$	0.0983**	0.1357**	0.0916**	0.1673**
	(2.3948)	(1.9753)	(2.3087)	(2.1853)
$Size_{i,t}$	0.3258*	0.1683**	0.0856**	0.1427
	(1.8126)	(2.0816)	(1.9942)	(1.0857)
$Lev_{i,t}$	0.0957***	0.1635**	0.0671***	0.11239*
	(4.3208)	(2.0321)	(3.8963)	(1.8386)
Observations	243	243	243	235
R-squared	0.7364	0.7799	0.6816	–
Number of ID	–	27	27	27
Number of instruments	–	–	–	18
AR2	–	–	–	0.6281
Hansen J-Stat	–	–	–	0.6717
Prob > F/Wald Prob > chi2	0.0000	0.0000	0.0000	0.0000

Note: *** – significant at 1%, ** – significant at 5%, and * – significant at 10%.

or to the currency redenomination activity. The results show that the coefficient of $Y_5CR_{i,t-5}$ is positive and insignificant. This result shows that the firms did not experience significant growth in their ROA this year. On the contrary, the coefficient of $Y_4CR_{i,t-4}$ is positive and significant at 0.05, suggesting that the firms enjoyed significant growth in their ROA in the fourth year preceding the currency redenomination exercise. The growth rate in the ROA in the third and second years before the redenomination of the Ghanaian currency was positive and insignificant ($p > 0.05$), implying that despite an increase in the firm's ROA in these years, they were not significant. The results further show that the firms obtained a positive and significant ($p < 0.05$) growth in ROA in the immediate year ($Y_1CR_{i,t-1}$) preceding the year (2007) of the currency redenomination.

Interestingly, the results further show that the coefficient of $Y_0CR_{i,t}$ is negative and significant ($p > 0.05$). This result implies that the firms' ROA was reduced in the year of the currency redenomination. These findings are not surprising because a change in the country's currency would cause a significant change in firms' operations, which would substantially increase the cost of operations and administrative costs. For example, the currency redenomination would force firms to print new stationeries and over-

haul their information technology infrastructure. One area that would consume more resources due to currency redenomination is the firms' accounting systems, which would require changes in the books, price labels, accounting software and balance sheet or accounting records. These activities consume a significant amount of resources, which would eventually erode their profit margin. Therefore, it is not surprising that the firms' profitability significantly decreased in the year of the currency redenomination. This explanation is consistent with the findings of Gunadi et al. (2018) who documented that redenomination exercise reduced the firms' profitability and value in the year of the redenomination, whilst sales increased. This finding also affirms the views of Tarhan (2006), who articulates that currency redenomination can increase transaction cost and decrease profitability in the short term.

The results further show a positive and insignificant growth in the firms' ROA in the immediate year ($Y_1CR_{i,t-1}$) after the redenomination currency (Ghana cedi). This result is interesting, given that the firms' profitability decreased in the year of the currency redenomination. The possible reason is that the firms may have incurred most of the expenditures associated with the currency redenomination in the year of the redenomination, hence little or no extra cost were in incurred in the following year. The coefficients of $Y_2CR_{i,t+2}$, $Y_3CR_{i,t+3}$, $Y_4CR_{i,t+4}$ and $Y_5CR_{i,t+5}$ are positive and significant. These results demonstrate that the firms were on a positive and significant growth trajectory from the second to the fifth year after the currency redenomination exercise. These results further demonstrate that the firms enjoyed continuous and significant growth in ROA in the second to fifth years after the currency redenomination.

These results show that the Ghana currency redenomination exercise in 2007 had a positive and significant impact on the profitability (ROAG) of listed firms in Ghana. This can be due to a possible reduction in the quantity of currency for a transaction that would decrease their transaction cost. This meant that few stationeries and equipment like safes were needed in their business, thus resulting in a decrease in transaction cost and improvement in profitability (ROAG). Another significant benefit related to the currency redenomination in Ghana is the simplification of accounting records. This could be achieved because the challenge of writing many zeros in a small space would be eliminated, therefore simplifying the preparation of financial records. After all, it would save time and resources concerning the calculation of figures. This will also translate into an improvement in the performance of firms. Another possible reason for the positive impact of the currency redenomination on the growth in the firms' profitability is that the currency redenomination resulted in the increment of the prices of products and services of firms that positively affected profitability. This was due to the unavailability of coins of specific denominations and the rejection of certain coins by customers. For instance, the one pesewa was not accepted by many customers as a medium of exchange because of its appearance, which resulted in the rounding up of prices and consequently increased the prices of goods and services and profits.

These results are in accordance with the objectives of the Bank of Ghana (BoG) for the redenomination of the Cedi. Prior to the currency redenomination, the Bank of Ghana indicated that the Cedi's redenomination would help simplify accounting records, reduce transaction volumes, reduce the cost of carrying large volumes of banknotes and its associated risks and improve the performance of businesses (Djokoto et al., 2013). Comparing the objectives of the BoG with the study's findings, it can primarily be suggested that the redenomination has achieved its objectives of improving the performance of firms in Ghana. The results of this study confirm the findings of earlier studies. For instance, the results agree with the findings of Priyono, (2013) and Rotunno (2016) who found that some specific but not exhaustive benefits of currency redenomination include inflationary pressures, psychological effect and control of currency substitution. Similarly, the result confirms the findings of Pambudi et al. (2014), Prabawan (2017) and Priyo and Putri (2019) who revealed that the benefits for redenominating a currency are a combination of economic and political factors such as inflation and an increase in currency credibility.

Regarding the size ($Size_{i,t}$) variable, the results show that it is positive and insignificant, as well as the leverage ($Lev_{i,t}$) variable. Hansen's J-test and second-order correlation (AR2) test were used to test the robustness of the models used for the estimation. Table 4 shows that the p-value of the Hansen's J-test is in-

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significant, suggesting that the number of instruments used in the model does not have any adverse effect on the estimators. Besides, the p-value of the AR2 is also insignificant, indicating that the model does suffer from an autocorrelation problem. These findings provide evidence that the results from the estimation model are reliable and robust. These robustness results demonstrate that the variations in the explanatory variables significantly explain the profitability growth (ROAG) of firms.

CONCLUSION

The news of the 2007 Ghana's currency redenomination was met with dissatisfaction from individuals and organizations, sparking much controversy between government and the citizens. After educating the local and foreign individuals and organizations on the benefits of this exercise by the BoG and the media, Ghanaians slowly adapted to the change. However, there were specific sectors of the economy that still opposed this redenomination, fearing its impact on their businesses. Hence, this study investigated the impact of the currency redenomination on the value of firms in Ghana. The study found that the value of the firms significantly increased in the year of the currency redenomination, whilst profitability decreased in the same year. The evidence further demonstrated that the value of the firms did not improve after the redenomination exercise, an indication that the currency redenomination did not have any significant impact on the value of the firms. On the other hand, the currency redenomination had a positive and significant impact on the firms' profitability. The results showed sustained growth in the profitability of the firms after the redenomination exercise. The study concludes the currency redenomination improved the firms' profitability, whilst their value was not improved.

The significant implication of the results is that governments can use redenomination as a tool to influence micro-economic activities. It is recommended that governments must embark on extensive public relation activities when they intend to redenominate their currency. This will allay investors' fears and uncertainties so that it will bring back confidence in the economy. The major limitation of this study is that it focused only on the listed firms that operated in a regulated system. It is not known how the redenomination exercise affected small, medium and micro enterprises (SMMEs), which accounts for about 90% of the total employment in the country. Therefore, it is recommended that further investigation be conducted on how currency redenomination affected the performance of SMMEs in Ghana.

Currency redenomination has been known to curb inflation and help economies recover from certain losses and get back on their feet, but it must be known that this is an interim measure that does not uproot the problem. Hence, another recommendation is for the government to initiate policies that will boost their local production to increase their exports, which is often the case in more developed economies.

AUTHOR CONTRIBUTIONS

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Investigation: Ferina Marimuthu, Haruna Maama.
Methodology: Ferina Marimuthu, Haruna Maama.
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Visualization: Ferina Marimuthu, Haruna Maama.
Writing – original draft: Ferina Marimuthu, Haruna Maama.
Writing – review & editing: Ferina Marimuthu.

REFERENCES

1. Astrini, D., Juanda, B., & Achsani, N. A. (2016). Impact of Redenomination on Price, Volume, and Value of Transaction: An Experimental Economic Approach. *Buletin Ekonomi Moneter dan Perbankan, 19*(2), 207-238. Retrieved from https://ideas.repec.org/a/idn/journl/v19y2016i2p1-32.html
2. Baeti, F. N., Juanda, B., & Asmara, A. (2018). Redenomination Policy and Economic Performance: Experimental and Historical Approach. *Signifikan: Jurnal Ilmu Ekonomi, 7*(2), 173-184. Retrieved from http://journal.uinjkt.ac.id/index.php/signifikan/article/view/6568
3. Bank of Ghana (2020). *Evolution of Currency in Ghana*. Retrieved from https://www.bog.gov.gh/bank-notes-coins/evolution-of-currency-in-ghana/ (access on July 21, 2020)
4. Charlie, W. A. N. G. (2019). History, policies and financial statements of the Irish currency commission and the Central Bank of Ireland (1927–1979). *Journal of Economics Bibliography, 6*(1), 30-47. Retrieved from https://ideas.repec.org/p/ris/jhisae/0079.html
5. Dzokoto, V. A., Mensah, E. C., & Opare-Henaku, A. (2013). The Impact of Currency Redenomination on Monetary Gift Giving in Ghana: An Exploratory Assessment. *Business Studies Journal, 5*(2), 69-90. Retrieved from https://www.abacademies.org/articles/bsjvol522013.pdf
6. Dzokoto, V. A. A., & Mensah, E. C. (2010). Making sense of a new currency: an exploration of Ghanaian adaptation to the new Ghana cedi. *The Journal of Applied Business and Economics, 10*(5), 11-18. Retrieved from http://www.na-businesspress.com/JABE/Jabe105/DzokotoWeb.pdf
7. Foo, C. T. (2019). Currency at War: A Longer View. In *Finance and Strategy Inside China* (pp. 1-14). Springer, Singapore. Retrieved from https://www.researchgate.net/publication/331657922_Currency_at_War_A_Longer_View
8. Gunadi, V., Lambey, L., & Tasik, H. H. (2018). Evaluating Financial Performances of Turkish Manufacturing Companies before and after Redenomination. *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis dan Akuntansi, 6*(4), 3368-3377. Retrieved from https://ejournal.unsrat.ac.id/index.php/emba/article/view/21336
9. Hamlin, D. (2019). The Reichsbank and German War Aims in 1918. *German History, 37*(4), 500-516. https://doi.org/10.1093/gerhis/ghz020
10. Handayani, S. W. (2020). Determining Factors urge a Redenomination. *UG Journal, 14*(5), 8-10. Retrieved from https://ejournal.gunadarma.ac.id/index.php/ugjournal/article/download/3348/2059
11. Ifunanya, O. C. (2020). Redenomination of Naira: A Critical Analysis of Its Problems and Prospects. *European Academic Research Journal, 7*(12), 6008-6016. Retrieved from https://www.researchgate.net/publication/344882968_Redenomination_of_Naira_A_Critical_Analysis_of_it's_Problems_and_Prospects
12. Mosley, L. (2005, September). Dropping zeros, gaining credibility? Currency redenomination in developing nations. In *2005 Annual Meeting of The American Political Science Association, Washington DC*. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.598.8186&rep=rep1&type=pdf
13. Obuobi, B., Nketiah, E., Awuah, F., Agyeman, F. O., Ofosu, D., Adu-Gyamfi, G., Adjei, M., & Amadi, A. G. (2020). Impact of Currency Redenomination on an Economy: An Evidence of Ghana. *International Business Research, 13*(2), 1-62. Retrieved from https://www.researchgate.net/profile/Emmanuel-Nketiah-2/publication/338622869_Impact_of_Currency_Redenomination_on_an_Economy_An_Evidence_of_Ghana/links/5e20283b299bf1e1fab5024a/Impact-of-Currency-Redenomination-on-an-Economy-An-Evidence-of-Ghana.pdf
14. Opare-Henaku, A., Mensah, E. C., & Dzokoto, V. A. (2013). Ghanaians' Perception and Evaluation of the New Ghana Cedi. *International Journal of Business, Humanities and Technology, 3*(4), 1-8. Retrieved from http://ijbhtnet.com/journals/Vol_3_No_4_April_2013/1.pdf
15. Pambudi, A., Juanda, B., & Priyarsono, D. S. (2014). Penentu Keberhasilan Redenominasi Mata Uang: Pendekatan Historis dan Eksperimental (Redenomination Success: Historical and Experimental Approaches). *Buletin Ekonomi Moneter dan Perbankan, 17*(2), 167-196. Retrieved from https://www.bmeb-bi.org/index.php/BEMP/article/view/48
16. Ponto, Ezri., & Tasik, H. H. D. (2017). Pt. Bank Sulutgo as A Regional Development Bank and The Infrastructure Loan: A Simulation Analysis. *Jurnal EMBA, 5*(2). Retrieved from https://ejournal.unsrat.ac.id/index.php/emba/article/view/17232
17. Prabawan, B. (2017). Potential Impacts of Redenomination: A Business Perspective. *International Journal of Business and Society, 18,* 295-308. Retrieved from http://www.ijbs.unimas.my/index.php/content-abstract/all-issues/51-vol-18-s2-2017/341-potential-impacts-of-redenomination-a-business-perspective
18. Prabawani, B., & Prihatini, A. E. (2014). Indonesian Businesses: Coping with Redenomination Policy. *Australian Journal of Basic and Applied Sciences, 8*(23), 245-254. Retrieved from https://www.researchgate.net/publication/317368176_Indonesian_Businesses_coping_with_redenomination_policy

http://dx.doi.org/10.21511/imfi.18(1).2021.19

19. Priyono, B. C. P., & Putri, C. C. (2019). Redenomination: between Opportunities and Challenges. *Journal of Applied Economics and Business, 7*(2), 5-27. Retrieved from http://www.aebjournal.org/article070201.php

20. Priyono, M. M. (2013). Redenomination; Between Hope and Reality (The study of the implementation of the Redenomination in Indonesia). *International Journal of Business and Management, 2*(4), 36-40. Retrieved from http://eprints.binadarma.ac.id/3740/

21. Purwana, D., Warokka, A., & Buchdadi, A. (2012). Money Illusion and the Middle-Lower Metropolis: Managing the Financial Phenomenon. *The Journal of Southeast Asian Research, 1*(1), 1-11. Retrieved from https://www.researchgate.net/publication/274660827_Money_Illusion_and_the_Middle-Lower_Metropolis_Managing_the_Financial_Phenomenon

22. Samuel, U. E., ben Etim Udoh, I. R. N., Prince, A. I., & Idogen, K. (2018). Naira Redenomination: The Nigerian's Perspective. *Journal of Global Economics, 6*(3), 1-10. Retrieved from https://www.researchgate.net/publication/328932529_Naira_Redenomination_The_Nigerians_Perspective

23. Suhendra, E. S., & Handayani, S. W. (2012). Impacts of redenomination on economics indicators. In *International Conference on Eurasian Economics,* 18-22. Retrieved from https://www.avekon.org/papers/395.pdf

24. Tankebe, J. (2008). Colonialism, legitimation, and policing in Ghana. *International Journal of Law, Crime and Justice, 36*(1), 67-84. http://doi.org/10.1016/j.ijlcj.2007.12.003

25. Temin, P. (2008). The German crisis of 1931: evidence and tradition. *Cliometrica, 2*(1), 5-17. Retrieved from https://econpapers.repec.org/article/afccliome/v_3a2_3ay_3a2008_3ai_3a1_3ap_3a5-17.htm

26. Young, B. (2020). From Sick Man of Europe to the German economic power house. Two narratives: ordoliberalism versus euro-currency regime. *German Politics, 29*(3), 464-478. https://doi.org/10.1080/09644008.2018.1559832