FOREIGN BANK ENTRY IMPACTED DOMESTIC-OWNED BANKS IN GHANA FROM 1975 TO 2008

Nsiah K. Acheampong*

Abstract

This article empirically examines the effects of foreign bank entry on the financial performance of Merchant Bank Ghana Limited and Ghana Commercial Banks Limited in Ghana from 1975 to 2008. The main result of the pooled regression was that foreign bank entry relatively increased domestic banks' return on assets for the period 1992-2008; a period with a high influx of foreign banks into Ghana. This result supported the studies by Beck, Demirguc-Kunt, and Levine (2006) and Boldrin and Levine (2009) that found that foreign bank entry enhanced domestic banks profitability margins. The presence of foreign-owned banks was not detrimental to the financial performance of the domestic-owned banks in Ghana.

JEL: E4; F2; G28

Key Words: Emerging Market Economies (EMEs), Foreign Bank Entry, Ghanaian-Owned Banks, Pooled Analysis

** University of Phoenix, 10004 Park Meadows Drive, Phoenix, AZ 85034, United States*
E-mail: nsiah.kumi@comcast.net

Introduction

The entry of banks owned by foreigners to operate banking services in emerging market economies (EMEs) is not a new global event (Domanski, 2005). Financial liberalization (Stein, 2010) and institutional reforms initiated by the International Monetary Fund (IMF) (Mathieson & Schinasi, 2000) and World Bank (Demirgüç-Kunt & Levine, 2008) were mainly responsible for this global event. The decision by EMEs to allow increased international financial competition could be explained by the standard theories of financial liberalization and technology spillover effect (Gormley, 2007; Stein, 2010). The four main components of the theories are foreign investment, foreign funding, capital inflow, profit, and interest transfers (Smith & Valderrama, 2007).

In addition, the structural adjustment programs (SAPs) prescribed by World Bank and IMF for EMEs paved the way for banks from developed countries to enter the EMEs to operate banking services (Demirgüç-Kunt & Levine, 2008; Nafziger, 2006). Moreover, some EMEs have instituted democratic governments that helped to open their banks to foreign competition. The entry of banks owned by foreigners has impacted financial performance of the domestic-owned banks in Ghana (Boldrin & Levine, 2009; Buchs & Mathisen, 2005; Kalluru & Bhat, 2009).

This quantitative multiple regression article has three main objectives. First, it tries to find significant relationship between capital adequacy, liquidity, and foreign-bank entry dummy on the return on assets (ROA) of two domestic-owned banks in Ghana, Merchant Bank Ghana Limited (MBG) and Ghana Commercial Bank Ghana Limited (GCB), from 1975 to 1991. This period marked limited entry of foreign banks into Ghana with foreign banks accounting for 33% of the banks in Ghana (PricewaterhouseCoopers, 2009).

Second, it tries to find significant relationship between capital adequacy, liquidity, and foreign-bank entry dummy on the ROA of the two domestic banks in Ghana from 1992 to 2008. This was the period with high influx of foreign-owned banks into Ghanaian banking system. For this period, with a net increase of 16 banks, 10 or 63% of banks in Ghana were foreign-owned (PricewaterhouseCoopers, 2009).

Third, it attempts to find significant relationship between capital adequacy, liquidity, and foreign-bank entry dummy on the ROA of the two domestic banks in Ghana from 1975 to 2008. This period marked the cumulative effect of the two sub-periods of before (1975-1991) and during (1992-2008) of the entry of foreign-owned banks into Ghana. Domestic-owned banks in EMEs, including Ghana, have to compete with foreign-owned banks for creditworthy domestic clients (Goldberg, 2009), which affected the performance of domestic banks in terms of ROA, liquidity, and capital adequacy (Derviz & Podpiera, 2008).

The Ghanaian banking system is diverse with 25 banks in operation in Ghana in 2008 (Bank of Ghana,

2009; PricewaterhouseCoopers, 2009): three development banks, five merchant banks, and 17 commercial banks. Thirteen of 52% of the 25 banks in Ghana is owned by foreigners (PricewaterhouseCoopers, 2009). Some of the foreign-owned banks in Ghana are Standard Chartered Bank of Ghana (StanChart, United Kingdom), Barclays Bank of Ghana (BBG, United Kingdom), Zenith Bank (Nigeria), and Trust Bank (South Africa) (Buchs & Mathisen, 2005; Pricewaterhouse Coopers, 2009). PricewaterhouseCoopers (2009) stated that the three largest commercial banks in 2008 had 42% of total assets of the banking sector: GCB (domestic-owned bank with 20%), Barclays Bank of Ghana (BBG, United Kingdom, foreign-owned bank with 13%), and Standard Chartered Bank (SCB, United Kingdom, foreign-owned bank with 9%). In 2008, BBG was the leader in deposits, among all banks, in Ghana, and GCB led in loan advances (PricewaterhouseCoopers, 2009).

The rest of the article is organized, after the introduction section, as follows: the review of empirical literature on the entry of banks owned by foreigners on the banking industry of EMEs and the financial consequences (Giannetti & Ongena, 2009). The next section presents data sources, sampling procedure, and modeling techniques for the article. It is followed by the empirical estimation and analysis of the results. The final section is the summary and conclusion.

Review of Empirical Literature

Various authors have written articles that provide relationship between the entry of banks owned by foreigners and the effects of the entry on the financial performance of indigenous banks in EMEs (Giannetti & Ongena, 2009). In this study, EMEs are countries reforming their economies from centrally controlled to market-oriented and offer avenues for foreign investments through FDI, banking, and ready markets for foreign technology (Demirgüç-Kunt & Levine, 2008). The increase in participation of foreign banks in the banking sector of EMEs in the early 1990s was as a result of financial integration (Giannetti & Ongena, 2009; Stein, 2010) and technology spillover (Gormley, 2007). Financial integration caused by significant financial market liberalization and elimination of barriers that previously restricted the entry of foreign banks led to the entry of foreign banks into EMEs (Domanski, 2005; Maudos & Solis, 2007; Stein, 2010).

Financial integration leads to improvement in financial performance of domestic-owned banks of EMEs. First, the entry of banks owned by foreigners into the domestic banking market of EMEs increases the financial performance of the indigenous banking sector (Demirgüç-Kunt & Levine, 2008). The World Bank's policies encouraged competition because increased competition tends to force banks to reduce operating costs, which would lead to increase in profits (Demirgüç-Kunt & Levine, 2008). Second, the assumption is that both foreign-owned and domestic-owned banks would make funding available to the small business owners or private sector of the economy because they are both competing for a bigger market share leading to economic growth (Beck, Demirgüç-Kunt, & Levine, 2006; Clarke, Cull, Martinez-Peria, & Sanchez, 2003).

Third, foreign-owned bank entry helps in improving the supervision of the indigenous banking system and enhances openness in banking (Demirgüç-Kunt, Detragiache, & Tressel, 2006). Last, the expectation is that banks owned by foreigners, during periods of financial crisis in the domestic banking system will provide stability in terms of offering credit because their parent banks have access to funding from global financial markets. The domestic financial markets will benefit because the foreign banks will not leave for their countries during financial crisis leading to economic and financial stabilization of the EMEs (Balasubramanyan, 2009).

Additionally, the entry of foreign-owned banks leads to financial benefits to the host countries because of technology spillover (Gormley, 2007). According to Gormley (2007), foreign-owned bank entry leads to the introduction of banking technology and financial innovations previously unknown to indigenous banks. These are beneficial to domestic banks because management teams of the domestic-owned banks could adopt these innovations and technology to improve the operations of their banks (Gormley, 2007).

The entry of banks owned by foreigners is beneficial to indigenous banking sector because it leads to improvement in the local financial infrastructure in the form of new technology and buildings (Gormley, 2007). It leads also to local banks learning from the banks owned by foreigners about good banking ideas, practices, and the transfer of expertise to the local banking system (Qin & Liu, 2008). Finally, attracting FDIs is beneficial to the economic growth of EMEs; foreign-owned banks may increase the availability of FDI to fund domestic income-producing projects, which leads to diversification and capital growth.

Foreign banks may also help in improving the management of domestic banks by participating in M&As or joint venture practices (Bhaumik & Gelb, 2005). This may lead to managerial improvement and efficiency because foreign banks would be managing the new entities (Bhaumik & Gelb, 2005). Foreign bank entry may also lead to the development, improvement in supervision, and legal framework of the domestic banking sector (Kalluru & Bhat, 2009). This is because banks owned by foreigners may demand improvement in the domestic banking

industry from the regulatory authorities (Kalluru & Bhat, 2009).

Claessens, Van Horen, Gurcanlar, and Mercado (2008) found in examining the relationship between entry of banks owned by foreigners and financial stability of the EMEs that banks owned by foreigners enter EMEs that have financial stability. Additionally, banks owned by foreigners prevent liquidity shocks to EMEs banking system because their highly capitalized parent banks provide assistance during financial crisis. Therefore, an EME that has foreign banks in its banking system can be protected irrespective of the risk-taking behavior of banks owned by foreigners (Yeyati & Micco, 2007).

Clarke et al. (2003) found that foreign banks that operated in Argentina in the latter part of the 1990s were more efficient than the indigenous banks. Debnath and Shankar (2008) found similar results in a study that banks from foreign countries compared to indigenous banks in India were relatively efficient using data for the period 2004-2005. Sanjeev (2009) did a similar study on Indian banks, using financial information for the period 2003-2007, and concluded that the results are still the same in that foreign banks are efficient compared to Indian local banks.

Data Sources, Sampling, Procedures, and Modeling Techniques

The study attempts to investigate foreign bank entry on the financial performance of domestic-owned banks in Ghana. The article was modeled structurally using a generalized banking operating efficiency function. Thus, the effects of foreign bank entry on the financial performance of domestic-owned banks in Ghana, bank's profitability model using capital adequacy, liquidity, and foreign-bank entry dummy variable is employed from 1975 to 2008.

A research for the study was conducted by reviewing the annual financial reports or balance sheet and income statements for the two selected indigenous banks in Ghana: MBG and GCB. The quantitative dependent variable was ROA measured as net income to total assets, which showed the profitable operations of domestic-owned banks in Ghana. The quantitative independent variables were two of the CAMELS factors and a dummy variable: (a) capital adequacy and (b) liquidity, and the other factor (c) was the foreign bank entry dummy (Derviz & Podpiera, 2008).

Capital adequacy measures the soundness of a bank's capital or assets (Buchs & Mathisen, 2005). Capital adequacy ratio (CAR) is used to monitor deposits to safeguard the interest of depositors and to encourage the stability and efficiency in the banking system (Buchs & Mathisen, 2005). In this study, CAR is a measure of the total shareholders' equity capital to total assets (Fraser & Ormiston, 2009).

Liquidity measures the quality and adequacy of current assets to meet current liabilities as they mature (Fraser & Ormiston, 2009). A liquid bank has adequate current assets that can be converted to cash without a loss in value. In banking, liquidity can predict the cash inflows and outflows accurately. A liquid bank provides a level of security to depositors in that in the case of liquidation of the bank, the depositors may receive their deposits (Fraser & Ormiston, 2009). In this study, liquidity ratio is measured as current assets to current liabilities (Buchs & Mathisen, 2005).

The foreign bank dummy was measured as foreign banks that entered Ghana in the study period, 1975-2008. If there was foreign bank entry in a particular year, 1 was assigned; otherwise, 0 (zero) was assigned. During the period 1992-2008, there was a high influx of foreign banks into Ghana.

The entry of foreign banks affected the financial performance of domestic banks in terms of ROA, liquidity, and capital adequacy (Derviz & Podpiera, 2008). Foreign-owned bank entry on domestic-owned banks was modeled using a generalized banking operating efficiency function:

$$Profitability = f\,(foreign\ bank\ entry,\ capital\ adequacy,\ and\ liquidity) \quad (1)$$

Where, profitability reflects productive efficiency measured in terms ROA of a bank. A bank's net income increases with a decrease in operating expenses; as a result, ROA would improve because ROA is measured by dividing net income by total assets in this article.

The model assumed that a bank's profitability increases when costs go down because a bank enjoys economies of scale, and when costs increase, a bank enjoys diseconomies of scales. The bank's profitability is modeled on the assumption of diminishing returns used by the Cobb-Douglas production function (Zellner, Kmenta, & Dreze, 1966). As explained by economic theory of the firm, output, and input; the profit of a firm is determined by the production function, the definition of profit, and the conditions of profit maximization (Felipe & Adams, 2005; Goodfriend & McCallum, 2006).

Three formulas developed were production function, profit definition, and profit maximizing conditions. These three formulas were applied to analyze foreign-owned bank entry and its effects on the profitable operations of the two indigenous banks in Ghana. The empirical model can be specified as follows:

$$ROA = b_0 + b_1 CapAdq + b_2 LiqRat + b_3 ForBankEntDum + u_t \quad (2)$$

Where,
ROA = bank's profitability
b_0 = intercept (constant).

$b_1CapAdq$ = regression coefficient that measured the sensitivity of capital adequacy ratio to ROA.

$b_2LiqRat$ = regression coefficient that measured the sensitivity of liquidity ratio to ROA.

$b_3ForBankEntDum$ = regression coefficient that measured the sensitivity of entry of foreign banks to ROA.

u_t = an error term or random disturbance because the u_t disturbs an otherwise stable relationship, in which *t* is the period of measurement.

The sample period runs from 1975 to 2008 with sub-periods as 1975-1991 and 1992-2008. The regression coefficient, b_n, was tested by designing a hypothesis with knowledge of the degrees of freedom (*df*) from the *t*-distribution table (Johnston & Duke, 2008). The degrees of freedom for all 13 multiple regressions for each of the two local banks is $df => n - (k + 1)$. Where n = sample period, and k = number of independent variable(s). The study had two periods, each with 17 sample periods (1975-1991) and 1992-2008. The df for each period: df => 17 – (3 + 1) = 13, and the sample period (1992-2008) was also 17 – (3 + 1) = 13 (Greene & Hensher, 2007; Greene Hensher, & Rose, 2006).

The longitudinal sample period of 1975-2008 had degrees of freedom $df = 34 - (3 + 1) = 30$. The hypothesis was formed as follows: $H_0 = \beta_0 = 0$ (null hypothesis). For example, if $H_0 = \beta_0 = 0$, the implication was that liquidity ratio has no significant effect on the profitability of the banks. However, if $H_a \neq \beta_0 \neq 0$, the alternative hypothesis, implying a significant relationship between liquidity ratio and profitability of the bank measured by ROA (Greene & Hensher, 2007; Greene et al., 2006).

Empirical Estimation and Analysis of Results

Prior to 1991, only three foreign banks operated in Ghana. Two of the three, Barclays Bank Ghana Limited (BBG) and Standard Chartered Bank Ghana Limited (StanChart), both originated from the United Kingdom (Frimpong, 2010). In 1990, Ecobank Ghana Limited (Togo) entered Ghana (PricewaterhouseCoopers, 2009). There was significant bank entry in Ghana from 1992 because for the periods 1996-1999 and 2003-2008, at least one foreign-owned bank entered Ghana (PricewaterhouseCoopers, 2009).

The financial data for MBG and GCB are analyzed to determine the financial performance f the two domestic-owned banks with the entry of foreign-owned banks. The variables used in the empirical analysis are return on assets, capital adequacy, liquidity, and foreign bank entry as a dummy.

Panels A, B, and C of Table 1 showed and reported the results of the descriptive statistics of Merchant Bank Ghana Limited (MBG), Ghana Commercial Bank Limited (GCB), and the combined data for MBG and GCB for the period 1975-1991. The number of observations for each banks for the period 1975-1991 was 17 (see Panels A and B of Table 1). The number of observations for the combined data for MBG and GCB for the period 1975-1991was 34 (see Panel C of Table 1). Panels D, E, and F of Table 2 showed and reported the results of the descriptive statistics for MBG, GCB, and the combined data for MBG and GCB for the period 1992-2008, respectively. The observed period for MBG and GCB was 17 for each and the combined data for both banks was 34. Panels G, H, and I of Table 3 showed and reported the results of the descriptive statistics for MBG, GCB, and the combined data for MBG and GCB for the period 1975-2008, respectively. The observed period for each bank was 34 and the combined data for both banks was 68.

The mean return on assets for MBG for the period 1992-2008 was 4.00% (see Panel D of Table 2) about 1.65% higher than the mean return on assets for the period 1975-1991 at 2.35% (see Panel A of Table 1). This indicated that MBG was growing in total assets over time. The mean return on assets for the period 1975-2008 was 3.17% (see Panel G of Table 3).

The mean liquidity ratio for MBG was about the same at 1.07 for the three periods: 1975-1991, 1992-2008, and 1975-2008, see Panel A of Table 1, Panel D of Table 2, and Panel G of Table 3, respectively. The mean for the capital ratio was relatively higher for MBG for the period 1992-2008, see Panel D of Table 2, than the period 1975-1991, see Panel A of Table 1, by about 5.06%. The means for the foreign bank entry dummy for MBG were 0.28%, 2.18%, and 1.23% for the periods 1975-1991, 1992-2008, and 1975-2008, see Table 1 Panel A, Table 2 Panel D, and Table 3 Panel G, respectively. The standard deviations for all the variables in the analysis for MBG were relatively higher in the period 1992-2008 and 1975-2008 than the period 1975-1991.

Table 1. Summary Statistics

Panel A: Summary Statistics for MBG for the Period 1975-1991 (N = 17)				
Variable	Mean (%)	*SD*	Minimum	Maximum
Return on assets	2.3453	1.1737	0.8900	4.6900
Liquidity	1.0471	0.0521	0.9400	1.1300
Capital ratio	8.0588	3.5789	3.0000	14.0000
Foreign bank entry dummy	0.2759	1.1375	0.0000	4.6900
Panel B: Summary Statistics for GCB for the Period 1975-1991 (N = 17)				
Variable	Mean (%)	*SD*	Minimum	Maximum
Return on assets	0.8535	0.8882	–0.7900	2.0900
Liquidity	1.0306	0.0338	1.0000	1.1300
Capital ratio	4.3529	4.0765	1.0000	15.0000
Foreign bank entry dummy	0.0853	0.3517	0.0000	1.4500
Panel C: Summary Statistics for MBG and GCB for the Period 1975-1991 (N = 34)				
Variable	Mean (%)	*SD*	Minimum	Maximum
Return on Assets	1.6562	1.2181	–0.7500	4.6900
Liquidity	1.0365	0.0433	0.9400	1.1300
Capital ratio	5.8235	3.9808	1.0000	14.0000
Foreign bank entry dummy	0.1806	0.8347	0.0000	4.6900

Source: Survey data from financial statements for MBG and GCB from 1975 to 2008.

The mean return on assets for GCB for the period 1992-2008 was about 3.30% (see Panel E of Table 2), which was about 2.45% higher than the mean return on assets for the period 1975-1991(see Panel B of Table 1). This indicated that GCB grew in total assets for the period 1992-2008. The mean return on assets for the period 1975-2008 was 2.08% (see Panel H of Table 3).

Table 2. Summary Statistics

Panel D: Summary Statistics for MBG for the Period 1992-2008 (N = 17)				
Variable	Mean (%)	*SD*	Minimum	Maximum
Return on assets	4.0006	2.1163	0.2000	8.9300
Liquidity	1.0947	0.0345	1.0500	1.1900
Capital ratio	13.1177	2.5220	9.0000	19.0000
Foreign bank entry dummy	2.1800	2.5761	0.0000	8.9300
Panel E: Summary Statistics for GCB for the Period 1992-2008 (N = 17)				
Variable	Mean (%)	*SD*	Minimum	Maximum
Return on assets	3.3029	1.6430	0.4100	5.7900
Liquidity	1.1112	0.0348	0.0800	1.2100
Capital ratio	12.8235	2.8556	9.0000	21.0000
Foreign bank entry dummy	1.8941	2.1088	0.0000	5.3600
Panel F: Pooled Regression Summary Statistics for MBG and GCB for the Period 1992-2008 (N = 34)				
Variable	Mean (%)	*SD*	Minimum	Maximum
Return on assets	3.6518	1.8989	0.2000	8.9300
Liquidity	1.1035	0.0352	1.0500	1.2100
Capital ratio	12.9706	2.6570	9.0000	21.0000
Foreign bank entry dummy	1.9259	2.3272	0.0000	8.9300

Source: Survey data from financial statements for MBG and GCB from 1975 to 2008.

The average liquidity ratio was about the same (1.06%) for the three periods for GCB. The mean for the capital ratio for GCB was relatively higher for the period 1992-2008 (see Panel E of Table 2) than the period 1975-1991 (see Panel B of Table 1) by about 8.47%. The mean for the foreign bank entry dummy was 0.09%, 1.89%, and 0.99% for the periods 1975-1991, 1992-2008, and 1975-2008 (see Panels B, E, and H of Tables 1, 2, and 3), respectively. The standard deviations for all the variables in the analysis for GCB were relatively higher for the periods 1992-2008 and 1975-2008 than the period 1975-1991 because of increased foreign bank entry in Ghana coupled with increased banking activities in the country. The maximum and minimum values showed similar trends.

Table 3. Summary Statistics

Panel G: Summary Statistics for MBG for the Period 1975-2008 (N = 34)				
Variable	Mean (%)	*SD*	Minimum	Maximum
Return on assets	3.1729	1.8829	0.2000	8.9300
Liquidity	1.0709	0.0498	0.9400	1.1900
Capital ratio	10.5882	3.9857	3.0000	19.0000
Foreign bank entry dummy	1.2279	2.1861	0.0000	8.9300
Panel H: Summary Statistics for GCB for the Period 1975-2008 (N = 34)				
Variable	Mean (%)	*SD*	Minimum	Maximum
Return on assets	2.0779	1.7992	–0.7900	5.7900
Liquidity	1.0715	0.0535	1.0000	1.2100
Capital ratio	8.5882	5.5220	1.0000	21.0000
Foreign bank entry dummy	0.9897	1.7490	0.0000	5.3600
Panel I: Summary Statistics for MBG and GCB for the Period 1975-2008 (N = 68)				
Variable	Mean (%)	*SD*	Minimum	Maximum
Return on assets	2.6343	1.9047	–0.7900	8.9300
Liquidity	1.0712	0.0513	0.9400	1.2100
Capital ratio	9.5882	4.8844	1.0000	21.0000
Foreign bank entry dummy	1.0532	1.9451	0.0000	8.9300

Source: Survey data from financial statements for MBG and GCB from 1975 to 2008.

Panels C, F, and I of Tables 1, 2, and 3 reported the analysis of the descriptive statistics for the combined data of the two domestic-owned banks, MBG and GCB, for the three periods. The number of observations for the periods, 1975-1991 (see Panel C of Table 1), and 1992-2008 (see Panel F of Table 2), was 34, a number significant enough to use SAS. The number of observations for the period 1975-2008 (see Panel I of Table 3), was 68. The mean return on assets for the two combined domestic-owned banks for the period 1992-2008 was 3.65%, see Panel F of Table 2, about 1.99% higher than the return on assets for the banks in the period 1975-1991, see Panel C of Table 1. This indicated that the combined data of the two domestic-owned banks was growing in total assets. The mean return on assets for 1975-2008 was 2.63%.

The average liquidity ratio was about the same (1.07%) for the three periods. The mean for the capital ratio for the combined data of the two domestic-owned banks for the period 1992-2008 was 12.97%, see Panel F of Table 2, about 7.15% higher than the period 1975-1991 at 5.82%, see Panel C of Table 1. The means for the foreign bank entry dummy were 0.18%, 1.93%, and 1.05% for the periods 1975-1991, 1992-2008, and 1975-2008, (see Panels C, F, and I of Tables 1, 2, and 3) respectively. Additionally, the standard deviations for all the variables in the analysis were relatively higher for the periods 1992-2008 and 1975-2008 than the period 1975-1991 because of an increase in foreign bank entry in Ghana, which led to an increase in banking activities in the country. The maximum and minimum values showed similar trends.

Panels J, K, and L of Table 4 showed and reported the analysis of the estimated correlation matrix for MBG, GCB, and the combined data for MBG and GCB for the period 1975-2008. This table indicated that no multicollinearity existed among the three independent variables. If such problem existed, the second number under each of the independent variables would be more than 0.5000. For example,

the second number under the intersection between liquidity and capital ratio was 0.0001 for MBG, GCB, and the combined data for MBG and GCB for the period 1975-2008 (indicating the absence of multicollinearity). The presence of multicollinearity reduces the power of the test (R-squared).

In Panel J of Table 4, there was positive and highly significant correlation between MBG's return on assets, liquidity, capital adequacy as well as foreign bank entry dummy. Moreover, in Panel K of Table 4, there was positive and significant correlation between GCB's return on assets and liquidity, capital adequacy as well as foreign bank entry dummy. In Panel L of Table 4, there was positive and significant correlation between the two combined domestic-owned banks' return on assets and liquidity, capital adequacy, and foreign bank entry dummy at 0.38, 0.49, and 0.57, respectively.

Table 4. Estimation Correlation Matrix

Panel J: Estimated Correlation Matrix MBG for the Period 1975-2008 (N = 34)				
Variable	1	2	3	4
1. Return on asset	1.0000			
2. Liquidity	0.4387***	1.0000		
	0.0094			
3. Capital ratio	0.5714***	0.7675***	1.0000	
	0.0004	0.0001		
4. Foreign bank entry dummy	0.5632***	0.3009**	0.2965**	1.0000
	0.0005	0.0838	0.0887	
Panel K: Estimated Correlation Matrix for GCB for the Period 1975-2008 (N = 34)				
Variable	1	2	3	4
1. Return on asset	1.0000			
2. Liquidity	0.3541**	1.0000		
	0.0399			
3. Capital ratio	0.3957**	0.9593***	1.0000	
	0.0205	0.0001		
4. Foreign bank entry dummy	0.6194***	0.3603**	0.4030***	1.0000
	0.0001	0.0363	0.0181	
Panel L: Estimated Correlation Matrix of Pooled Regression for MBG and GCB for the Period 1975-2008 (N = 68)				
Variable	1	2	3	4
1. Return on asset	1.0000			
2. Liquidity	0.3719 ***	1.0000		
	0.0018			
3. Capital ratio	0.4895 ***	0.8555 ***	1.0000	
	0.0001	0.0001		
4. Foreign bank entry dummy	0.5651***	0.2888 ***	0.3163 ***	1.0000
	0.0001	0.0169	0.0086	

Note: Prob > $|r|$ under H_0: Rho = 0. The rule of thumb applied here is that if the prob > $|r|$, no multicollinearity exists among the three independent variables (1975- 2008).
Panels J and K of Table 4:
*** Indicates the statistical significance at the 1% level with the critical value of ± 2.70.
** Indicates the statistical significance at the 5% level with the critical value of ± 2.02.
* Indicates the statistical significance at the 10% level with the critical value of ± 1.70. These are the critical values for 34 observations.
Panel L of Table 4:
*** Indicates the statistical significance at the 1% level with the critical value of ± 2.65. ** Indicates the statistical significance at the 5% level with the critical value of ± 1.99. * Indicates the statistical significance at the 10% level with the critical value of ± 1.66. These are the critical values for 68 observations.

Source: Survey data from financial statements for MBG and GCB from 1975 to 2008.

Panel M of Tables 5 showed and reported the ordinary least squares (OLS) results for MBG for the period 1975-1991. The independent variables, namely, liquidity ratio, capital ratio, and foreign bank entry dummy explained MBG's return on assets by 34% (Adjusted-R^2 was 34%). However, liquidity ratio was not statistically significant, as the other independent variables, in explaining the bank's return on assets. Capital ratio and foreign bank entry dummy were statistically significant in explaining the bank's return on assets at 1% and 10% levels, respectively.

Capital ratio was the strongest variable in explaining MBG's return on assets for the period 1975-1991. For every 1% increase in MBG's capital ratio, its return on assets increased to 0.18%. Similarly, with an increase in foreign bank entry dummy by 1%, MBG's return on assets increased to 0.40%. The effect of foreign bank entry dummy was relatively greater than that of capital ratio for the period 1975-1991.

The Durbin-Watson statistic that detects the presence of auto-correlation was 2.30 (the acceptable range is around ≈ 2.0). If auto-correlation problem occurred in the data, it would mean that the variables were measured with errors. The presence of errors in the data would cast doubts on this study results. To remove auto-correlation problem, the differences in the data must first be found, (*t*-1), and to filter out the errors.

Table 5. Ordinary Least Square

Panel M: Ordinary Least Square (OLS) for MBG for the Period 1975-1991 (N = 17)				
Regressor	Coefficient	Standard error	T-ratio	[Prob] > |t|
Intercept	0.8564	0.6139	1.3400	0.4964
Liquidity	2.6703	6.4540	0.4100	0.6858
Capital ratio	0.1848	0.0699	3.0800***	0.0185
Foreign bank entry dummy	0.3983	0.2124	1.8900*	0.0818
Panel N: Ordinary Least Square (OLS) for GCB for the Period 1975 -1991 (N = 17)				
Regressor	Coefficient	Standard error	T-ratio	[Prob] > |t|
Intercept	–31.7367	19.9171	–1.5900	0.1351
Liquidity	33.0179	19.8750	1.6600	0.1206
Capital ratio	–0.3331	0.1285	–2.5900 **	0.0224
Foreign bank entry dummy	0.1422	0.9473	0.1500	0.8830
Panel O: Pooled Regression Ordinary Least Square (OLS) for MBG and GCB for the Period 1975-1991 (N = 34)				
Regressor	Coefficient	Standard error	T-ratio	[Prob] > |t|
Intercept	0.6311	6.1122	0.1000	0.9184
Liquidity	0.1260	6.1700	0.0200	0.9838
Capital ratio	0.1424	0.0690	2.0600 **	0.0477
Foreign bank entry dummy	0.3601	0.2278	1.5800	0.1244

Note: Dependent variable: Return on assets. Reprinting student t-tables from P. B. Hoel. Introduction to Mathematical Statistics, 4th ed., New York: NY, Wiley, 1971 by permission of the publishers.
Panel M of Table 5: Adjusted R^2 = 0.34. Durbin-Watson statistic = 2.30.
Panel N of Table 5: Adjusted R^2 = 0.31. Durbin-Watson statistic = 1.79.
Panels M and N of Table 5:
*** Indicates the statistical significance at the 1% level with the critical value of ± 3.01. ** Indicates the statistical significance at the 5% level with the critical value of ± 2.16.
* Indicates the statistical significance at the 10% level with the critical value of ± 1.79. These are the critical values for 17 observations.
Panel O of Table 5: Adjusted R^2 = 0.30. Durbin-Watson Statistic = 1.59.
*** Indicates the statistical significance at the 1% level with the critical value of ± 2.70. ** Indicates the statistical significance at the 5% level with the critical value of ± 2.02. * Indicates the statistical significance at the 10% level with the critical value of ± 1.70. These are the critical values for 34 observations.

Source: Survey data from financial statements for MBG and GCB from 1975 to 2008.

Panel N of Table 5 reported and discussed the ordinary least squares (OLS) results for GCB the period 1975-1991. The independent variables, namely liquidity, capital adequacy, and foreign bank entry dummy could explain GCB's return on assets by 31% (Adjusted-R^2 was 31%). Liquidity ratio and foreign bank entry dummy were not significant in explaining the bank's return on assets.

Capital ratio was statistically significant in explaining the GCB's return on assets at 5% level. Therefore, capital ratio was the only variable that explained GCB's return on assets in the period 1975-1991. It was noted that when GCB's capital ratio increased by 1%, its return on assets decreased by 0.33%. Therefore, capital ratio had negative effect on GCB's return on assets in the period 1975-1991. The Durbin-Watson statistic that detects the presence of auto-correlation was 1.79 (the acceptable range is around ≈ 2.0).

Panel O of Table 5 reported the results of the pooled ordinary least squares (OLS) for the two domestic-owned banks (MBG and GCB) in this study for the period 1975-1991. During this period, liquidity ratio, capital ratio, and foreign bank entry dummy could explain domestic the banks' return on assets by 30% (Adjusted-R^2 was 30%). Liquidity ratio and foreign bank entry dummy were not significant in explaining the bank's return on assets. The capital adequacy ratio was statistically significant in explaining the domestic banks' return on assets at 5% level.

Empirically, when the domestic banks' capital adequacy ratio increased by 1%, their return on assets decreased by 0.14%, indicating a relatively smaller multiplier effect of capital ratio on the banks' return on assets for the period 1975-1991. The Durbin-Watson statistic that detects the presence of auto-correlation was 1.59 (the acceptable range is around ≈ 2.0). If auto-correlation problem occurred in the data, the variables were measured with errors, as explained above.

Panels P, Q, and R of Table 6 reported and discussed the ordinary least squares (OLS) results for MBG, GCB, and the combined data for both banks for the period 1992-2008. In the period 1992-2008 for MBG, shown in Panel P of Table 6, the adjusted R-squared was 29%. Liquidity was not significant in explaining the MBG's return on assets in the observed period. However, capital ratio and foreign bank entry dummy were statistically significant in explaining the MBG's return on assets at 10% and 5%, respectively.

Empirically, when MBG's capital ratio increased by 1% its return on assets rose to 0.51%. Similarly, with an increase in foreign bank entry dummy by 1%, MBG's return on assets increased to 0.46% in the observed period. Therefore, capital ratio and foreign bank entry increased MBG's assets about 0.50% in the period 1992-2008. The Durbin-Watson statistic that detects the presence of auto-correlation was 2.16 (around the acceptable range of ≈ 2.0).

In the period 1992-2008 for GCB, shown in Panel Q of Table 6, the reported adjusted R-squared for GCB was 55%. Foreign bank entry dummy was statistically significant in explaining GCB's return on assets. This means that the influx of foreign banks in Ghana affected the financial performance of GCB. The regression coefficient for the foreign bank entry dummy indicated that for 1% increase in the foreign bank entry dummy, GCB's return on assets increased by 0.14% in the observed period.

Liquidity ratio and capital ratio were statistically significant in explaining GCB's return on assets at 1% and 5% level, respectively. By implication, when GCB liquidity ratio increased by 1% its return on assets decreased by 68.48%. Similarly, when GCB's capital ratio increased by 1%, its return on assets increased by 0.57% in the observed period, see Panel Q of Table 6. Liquidity had a negative effect on GCB's return on assets. The Durbin-Watson statistic that detects the presence of auto-correlation was 2.15 (around the acceptable range of ≈ 2.0).

Table 6. Ordinary Least Square

Panel P: Ordinary Least Square (OLS) for MBG for the Period 1992-2008 (N = 17)					
Regressor	Coefficient	Standard error	T-ratio	[Prob] > | t |	
Intercept	11.4164	16.9044	0.6800	0.5113	
Liquidity	–13.7447	17.2442	–0.80	0.4397	
Capital ratio	0.5058	0.2369	2.1400*	0.0524	
Foreign bank entry dummy	0.4566	0.1806	2.5300**	0.0252	
Panel Q: Ordinary Least Square (OLS) for GCB for the Period 1992-2008 (N = 17)					
Regressor	Coefficient	Standard error	T-ratio	[Prob] > | t |	
Intercept	71.8357	19.3540	3.7100	0.0028	
Liquidity	–68.4771	19.7182	–3.4700***	0.0043	
Capital ratio	0.5679	0.2323	2.4500**	0.0295	
Foreign bank entry dummy	0.1449	0.1423	1.0200	0.3274	

Table 6 (continued)

Panel R: Pooled Regression Ordinary Least Square (OLS) for MBG and GCB for the Period 1992-2008 (N = 34)

Regressor	Coefficient	Standard error	T-ratio	[Prob] > | t |
Intercept	27.1828	11.8501	2.2900***	0.0290
Liquidity	–26.1685	12.0580	–2.1700**	0.0380
Capital ratio	0.3538	0.1614	2.1900**	0.0363
Foreign bank entry dummy	0.3936	0.1243	3.1700***	0.0035

Note. Dependent variable: Return on assets.

Reprinting student *t*-tables from P. B. Hoel. *Introduction to Mathematical Statistics*, 4th ed., New York: NY, Wiley, 1971 by permission of the publishers.
Panel P of Table 6: Adjusted $R^2 = 0.29$. Durbin-Watson statistic = 2.16.
Panel Q of Table 6: Adjusted $R^2 = 0.55$. Durbin-Watson statistic = 2.15.
Panels P and Q of Table 6
*** Indicates the statistical significance at the 1% level with the critical value of ± 3.01.
** Indicates the statistical significance at the 5% level with the critical value of ± 2.16.
* Indicates the statistical significance at the 10% level with the critical value of ± 1.79. These are the critical values for 17 observations.
Panel R of Table 6: Adjusted $R^2 = 0.26$. Durbin-Watson Statistic = 2.10.
*** Indicates the statistical significance at the 1% level with the critical value of ± 2.70.
** Indicates the statistical significance at the 5% level with the critical value of ± 2.02.
* Indicates the statistical significance at the 10% level with the critical value of ± 1.70. These are the critical values for 34 observations.

Source: Survey data from financial statements for MBG and GCB from 1975 to 2008.

For the period 1992-2008, shown in Panel R of Table 6, the reported adjusted R-squared for both domestic banks was 26%. Capital adequacy ratio and foreign bank entry dummy were positive and statistically significant in explaining the two domestic banks' return on assets. Liquidity ratio was negative and statistically significant in explaining two domestic-owned banks' return on assets at 5% level. For 1% increase in capital ratio and foreign bank entry dummy of the two domestic banks' return on assets increased by 0.35% and 0.39%, respectively.

Therefore, capital adequacy and foreign bank entry dummy positively affected the domestic banks' return on assets due in part to high influx of foreign banks in Ghana. Liquidity ratio had negative effect on return on assets. For every 1% increase in liquidity ratio, the two domestic banks return on assets decreased by 26.17% in 1992-2008. The Durbin-Watson statistic that detects the presence of auto-correlation was 2.10 (the acceptable range is around ≈ 2.0).

Panel S of Table 7 reported the adjusted R-squared for MBG for the period 1975-2008, which was 45%. Foreign bank entry dummy and capital ratio were statistically significant in explaining MBG's return on assets in the observed period by 1% and 5%, respectively. For every 1% increase in MBG's foreign bank entry dummy, MBG's return on assets increased by 0.38%. Similarly, when MBG's capital adequacy ratio increased by 1%, its return on assets increased by 0.24%. Therefore, foreign bank entry dummy relatively had more effect on MBG's return on assets than capital ratio for the period. The Durbin-Watson statistic that detects the presence of auto-correlation was 2.28 (the acceptable range is around ≈ 2.0).

Panel T of Table 7 reported the adjusted R-squared for GCB for the period 1975-2008, which was 52%. Capital adequacy ratio was eliminated from the analysis because of the presence of multicollinearity between the former and liquidity ratio. Liquidity ratio and foreign bank entry dummy were statistically significant in explaining GCB's return on assets in the observed period by 1% and 5%, respectively. When GCB's liquidity ratio increased by 1%, its return on assets increased by 13.03%. Similarly, when GCB foreign bank entry dummy increased by 1%, GCB's return on assets increased by 0.28%. Therefore, liquidity ratio had a larger multiplier effect on the GCB's return on assets in the long-run period than foreign bank entry dummy. The Durbin-Watson statistic that detects the presence of auto-correlation was 1.47 (the acceptable range is around ≈ 2.0).

Table 7. Ordinary Least Square

Panel S: Ordinary Least Square (OLS) for MBG for the Period 1975-2008 (N = 34)				
Regressor	Coefficient	Standard error	T-ratio	[Prob] > |t|
Intercept	3.3526	7.4900	0.4500	0.6576
Liquidity	–2.9415	7.6859	–0.3800	0.7046
Capital ratio	0.2368	0.0958	2.4700**	0.0193
Foreign bank entry dummy	0.3772	0.1174	3.2100***	0.0031
Panel T: Ordinary Least Square (OLS) for GCB for the Period 1975-2008 (N = 34)				
Regressor	Coefficient	Standard error	T-ratio	[Prob] > |t|
Intercept	–11.5219	3.0924	–3.7300	0.0008
Liquidity	13.0324	2.9014	4.4900***	0.0001
Capital ratio				
Foreign bank entry dummy	0.2816	0.1296	2.1700**	0.0376
Panel U: Pooled Regression Ordinary Least Square (OLS) for MBG and GCB for the Period 1975-2008 (N = 68)				
Regressor	Coefficient	Standard error	T-ratio	[Prob] > |t|
Intercept	8.4163	6.6390	1.2700	0.2095
Liquidity	-7.6570	6.7272	-1.1400	0.2593
Capital ratio	0.2029	0.0713	2.8500***	0.0059
Foreign bank entry dummy	0.4505	0.0968	4.6500***	0.0001

Note. Dependent variable: Return on assets. Reprinting student *t*-tables from P. B. Hoel. *Introduction to Mathematical Statistics*, 4th ed., New York: NY, Wiley, 1971 by permission of the publishers.
Panel S of Table 7: Adjusted $R^2 = 0.45$. Durbin-Watson statistic = 2.28.
Panel T of Table 7: Adjusted $R^2 = 0.52$. Durbin-Watson statistic = 1.47.
Panels S and T of Table 7:
*** Indicates the statistical significance at the 1% level with the critical value of ± 2.70.
** Indicates the statistical significance at the 5% level with the critical value of ± 2.02.
* Indicates the statistical significance at the 10% level with the critical value of ± 1.70. These are the critical values for 34 observations.
Panel U of Table 7: Adjusted $R^2 = 0.41$. Durbin-Watson Statistic = 1.55.
*** Indicates the statistical significance at the 1% level with the critical value of ± 2.65.
** Indicates the statistical significance at the 51% level with the critical value of ± 1.99.
* Indicates the statistical significance at the 10% level with the critical value of ± 1.66. These are the critical values for 68 observations.

Source: Survey data from financial statements for MBG and GCB from 1975 to 2008.

Panel U of Table 7 reported the adjusted R-squared for GCB and MBG for the period 1975-2008, which was 41%. Liquidity ratio was not significant in explaining the two domestic banks' return on assets. Capital adequacy and foreign bank entry dummy were statistically significant in explaining the domestic banks' return on assets in the observed period by 1%, respectively. For every 1% increase in capital ratio the domestic banks' return on assets increased by 0.20%. Similarly, for every 1% increase in foreign bank entry dummy, the domestic banks' return on assets increased by 0.45%. Therefore, capital adequacy and foreign bank entry dummy positively affected the two domestic banks' return on assets due in part to the high influx of foreign banks in Ghana. The Durbin-Watson statistic that detects the presence of auto-correlation was 1.55 (the acceptable range is around ≈ 2.0).

Conclusions

This quantitative multiple regression study focused on examining empirically the effects of the entry of banks owned by foreigners on return on assets of

domestic-owned banks in Ghana from 1975 to 2008. The objectives of the study were broken down into three research questions and two related issues. First, quantitative variables and one dummy variable were employed to explain domestic banks' return on assets in Ghana from 1975 to 1991. Second, quantitative variables and one dummy variable were employed to explain domestic-owned banks' return on assets in Ghana from 1992 to 2008. Third, quantitative variables and one dummy variable were employed to explain domestic banks' return on assets in Ghana for the cumulative period of 1975-2008.

The dependent variable for the study was on return on assets (ROA) measured as net income to total assets. The independent variables were liquidity, capital adequacy, and foreign bank entry dummy. The independent variable, liquidity ratio, was measured as current assets to current liabilities. The independent variable, capital adequacy ratio, was measured as shareholders' equity to total assets. The dummy variable was measured as foreign banks that entered Ghana in the study period, 1975-2008. If there was a foreign bank entry in a particular year, 1 was assigned; otherwise, 0 was assigned.

The goal of this quantitative multiple regression study was to examine empirically the effects of the entry of banks owned by foreigners on ROA of two domestic-owned banks in Ghana, MBG and GCB, from 1975 to 2008. The study was conducted by reviewing the annual financial reports or balance sheet and income statements for these two selected indigenous banks in Ghana. The quantitative dependent variable was ROA and the quantitative independent variables were two of the CAMELS factors and a dummy variable: (a) capital adequacy and (b) liquidity, and the other variable (c) was the foreign bank entry dummy (Derviz & Podpiera, 2008). The foreign bank entry dummy was measured as foreign banks that entered Ghana in the study period, 1975-2008. If there was foreign bank entry in a particular year, 1 (one) was assigned; otherwise, 0 (zero) was assigned.

The results from the pooled regression analysis consistently found that foreign bank entry dummy significantly explained the combined data of the two selected domestic-owned banks' ROA for the cumulative period of 1975-2008 and for the period 1992-2008. This was because Ghana experienced a high influx of foreign banks for the period 1992-2008. For instance, the mean ROA for the two combined domestic-owned banks for the period 1992-2008 was 3.65%, about 2.00% higher than the ROA for the same banks in the period 1975-1991.

The results of the study support the theories of technology spillover (Gormley, 2007), and financial or market integration (Demirgüç-Kunt & Levine, 2008; Giannetti & Ongena, 2009). The entry of foreign banks has had a technology spillover effect on domestic-owned banks in Ghana in that domestic-owned banks are using new technology to improve their financial performance (Buchs & Mathisen, 2005; Gormley, 2007). Domestic-owned banks in Ghana have provided their customers with access to automated teller machines (ATMs) and online banking.

The main limitation of the study was using three quantitative variables and one key dummy variable. The quantitative independent variables were two of the CAMELS factors and a dummy variable: (a) capital adequacy and (b) liquidity, and the other variable (c) was the foreign bank entry dummy. The dependent variable was return on assets (ROA). Other variables, for instance, debt ratio and market risk could have been added to the independent variables with the foreign bank entry dummy to increase the coefficient of determination (R-squared). The banks' operating efficiency (total expenses/total assets) or return on shareholders' equity capital (ROE, measured as net income to stockholders' equity) could have been used instead of the study's dependent variable (ROA). ROE was not used because this study measured the banks' total performance instead of individual investor's performance.

The future direction of this study is to duplicate the model to banking sectors of other EMEs. The results of this study may not be applicable to banks in other countries without recognizing the uniqueness of each country. Applying the conclusions based on data from Ghana to other countries may depend on the economic and financial micro- and macro-structures. It may be useful for other studies following this model to add some qualitative factors, for example, leadership style of the management team with the quantitative factors. This would provide both subjective and objective significant analysis on financial performance of the domestic-owned banks with the entry of foreign-owned banks. Moreover, in countries where there are more domestic-owned banks with available financial reports, the researchers should increase the number of banks and include more quantitative variables, for instance, debt ratio, market risk, and return on equity in the study.

The government of Ghana and the banking authorities need to continue to encourage SAPs (Demirgüç-Kunt & Levine, 2008). Banking authorities need to have policies in place to ensure that the foreign banks are competing fairly with domestic-owned banks. Reforming and developing domestic financial markets would attract banks owned by foreigners and could accelerate the growth of the financial sector in Ghana (Beck et al., 2006; Boldrin & Levine, 2009). Based on the results from this study, the governments of Ghana and other similar EMEs need to attract foreign-owned banks into their banking industry. The entry is not detrimental to domestic-owned banks at all times.

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