

African Research Review

An International Multi-Disciplinary Journal, Ethiopia

Vol. 5 (1), Serial No. 18, January, 2011

ISSN 1994-9057 (Print)

ISSN 2070-0083 (Online)

The Macro-Economy and Housing Credit Market in Ghana (Pp. 25-39)

Boamah, Nicholas Addai - Department of Real Estate and Land Management (DRELM), Faculty of Planning and Land Management, University for Development Studies, WA Campus, P.O. Box 520, WA, Ghana

E-mail: addaianas@yahoo.com; nboamahaddai@yahoo.com

Abstract

The housing finance market of Ghana is underdeveloped. A number of studies have suggested that the weak and unstable macro-economic environment in the country is responsible for this. These studies however, showed the relationship between the country's mortgage market and the macro-economy through qualitative techniques. This paper, examines this relationship via regression models. It regressed mortgage originations in the country on inflation, interest, and exchange rates to determine their impacts on mortgage market activities. It found out that the only significant factor influencing mortgage origination in the country is the exchange rate. It suggests that this exists because mortgages in Ghana are denominated in foreign currencies notably the United States dollar and that mortgagees focus on Ghanaian residents abroad or Ghanaians with foreign currency denominated income. It notes that resident Ghanaians have been priced out of the mortgage market by high exchange rate levels and the "dollalization" of mortgages in the country. It recommends that policy must focus on addressing the exchange rate problem in order to make the mortgage market attractive to both mortgagees and resident Ghanaians.

Key Words: Mortgage originations, Macroeconomic Factors, Housing Credit, Ghana

Introduction

Housing finance markets have become increasingly important to the financing and development of housing all over the world. Gyamfi-Yeboah and Boamah (2003) noted that the mortgage is one of the major means of raising funds to finance the purchase of houses in many parts of the world. For instance, Proxenos and Taff (2005) noted that Mortgage Backed Securities (MBS) is the dominant form of providing housing funds in the United States; the home loans securities market is over US\$6 trillions. From a macroeconomic perspective, housing investment accounts for about half of all gross private investment, and the liabilities from home mortgages are approximately equal to two-thirds of gross domestic product (Chambers et al, 2008). Smith (2005) noted that mortgage debt account for three quarters of the United Kingdom's total households' interest bearing debt. Warnock and Warnock (2008) observed that housing constitutes the largest expense of and the most important assets of most households all over the world. The housing finance markets offer an enormous benefit to homebuyers and the economy in general, hence the increasing reliance on the mortgage market to fund housing development in most countries of the world. Experience has shown that a well functioning mortgage market will provide huge external benefits to the national economy via efficient real estate development, capital market development, construction sector employment, easier labour mobility, more efficient resource allocation, and lower macroeconomic volatility (Renaud, 2004). The Bank of Ghana (BoG) (2007) noted that a well functioning mortgage market primarily will increase funding for housing at competitive cost and pricing to consumers of housing, thereby enabling more people to afford decent housing. The mortgage securities market performs a number of valuable functions, including improving housing affordability, increasing the flow of funds to the housing sector and better allocation of the inherent housing finance risks. A formal housing finance market will promote housing investment and development by providing sustainable housing funds to households (Boamah, 2009).

The housing finance market has become a huge area of investment in addition to mobilising and channelling sustainable funds to homebuyers. With growing economies, the housing finance markets have become integrated to the wider financial markets. Mortgage Backed Securities (MBS) are now being traded in most financial markets through out the world. For instance, by the close of 2006, the European Commercial Mortgage Backed Securities (CMBS) outstanding, stood at €118.4 (in billions), and the

outstanding amount of US Agency mortgage-backed securities was \$4,604.2 billion by the close of 2007 (Securities Industry and Financial Markets Association, 2008).

The housing finance market is an essential component of a well functioning housing system. It is imperative for countries to develop sustainable housing finance markets if they are to be able to meet the housing needs of their citizens. Mortgage finance has become a critical factor in generating effective housing demand across the globe. The provision of housing finance imposes a binding constraint that must be addressed before the market can sustainably deliver adequate housing (Warnock and Warnock, 2008). Ball (2003) noted that home prices range from 4 times annual households income in developed economies to 8 times annual households income in developing economies. Therefore, adequate housing finance must make it possible for borrowers' to spread payments over a longer term. But, the ability of nations to develop sustainable housing finance market and to realize the enormous benefit associated with it depends on the prevailing macro-economic environment. Thus Sandilands (2002) noted that it is incumbent upon policy-makers to get the macroeconomic conditions right. Macroeconomic instability impacts negatively on the housing market and housing finance (Richupan, 1999). A stable macro-economic environment (a low inflation and interest rates and a stable currency) is an important requirement for a successful mortgage market (Boamah, 2009). Waigel (2000) noted that national and international economic trends, interest rate, price stability, and exchange rate are all vital to housing finance. These factors are very crucial for the attainment of a vibrant mortgage market (Gyamfi-Yeboah and Boamah, 2003). Countries with a more stable macroeconomic environment have deeper housing finance system (Warnock and Warnock, 2008).

A number of authors such as Karley (2002), Boamah (2003), Asare and Whitehead (2004), Akuffo (2006) and Boamah (2009) have all asserted that the macro-economic environment of Ghana has constrained the development of the housing finance market in the country. Boamah (2009) for instance noted that interest rate risk is very substantial in Ghana and that high inflation rates have expanded mortgage market risk in the country. The BoG (2007) noted that high inflation rate and volatile exchange rate movements have tended to price out Ghanaian borrowers. The real depreciation of debt outstanding resulting from inflation made the mortgage market uninviting to lenders (Akuffo, 2006). Asare and Whitehead (2004) suggested that there is a "dollarization" phenomenon in the country as a result of exchange rate risk.

The high rate of inflation in the country distorted the incentive structures in the Ghanaian economy and shifted preferences towards short-term ventures instead of long-term ones, which had a negative impact on housing (Boamah, 2003). All these authors examined the effect of the country's macro-economic environment on the development of the housing finance market of the country qualitatively. But this paper examines the relationship between the macro-economic environment and the Ghanaian mortgage market quantitatively. It specifically examines the relationship between mortgage originations and inflation, interest, and exchange rates in Ghana through regression models.

Methodology

The study examined the relationship between mortgage originations and macro-economic factors (inflation, interest, and exchange rates) in Ghana. It runs two separate regressions. First, it runs a regression with mortgage originations (number of mortgages originated) as the dependent variable and either inflation, interest rates, or exchange rate as the independent variable to determine the relationship between mortgage originations and each of these variables separately. It further carried out a multivariate-regression with mortgage originations as the explained variable and inflation, interest rate, and exchange rate as the explanatory variables. The econometric software, *eviews* was used for the analysis.

The inflation data were obtained from the International Monetary Fund (IMF) World Economic Outlook Database online. Exchange rates for the period 1992 to 2002 and 2003-2008 were respectively obtained from the Ghana Statistical Service (GSS) and the Statistical Bulletins (various issues from 2004-2008) of the Bank of Ghana (BoG). Interest rates were obtained from the Ghana Statistical Service. The IMF, BoG and GSS data were used in the study because these institutions hold high quality time series macro-economic data on Ghana; the data used in the study is therefore highly reliable. Data on mortgage originations were obtained from the HFC Bank Ltd (formerly Home Finance Company Ltd). The HFC Bank's data were used because it is the major mortgage lender in the country and also the most active lender in the housing finance market of the country. It originates about 90% of mortgages in Ghana. It is also the only institution that a long duration data were available. The data used were annual data and covered the period 1992 to 2008. The mortgage data embodies the HFC Bank's mortgage lending activities since its inception in 1991. Though, the Ghana Home

Loans (GHL) is also active in the Ghanaian mortgage market aside the HFC Bank, no data could be obtained from them.

The Model

The model explains what determines mortgage originations in Ghana. The model incorporates variables that affect both the demand and supply sides of the housing finance market. It postulates that mortgage origination is determined by the following variables: inflation, exchange rate, and interest rate. It asserts that these variables influence mortgage originations collectively, or individually or in some combination. The choice of the variables are based on their impacts on mortgage market risk and hence on interest rate charged by mortgage lenders, mortgage affordability, prospects of mortgagor default, and the value of latter mortgage payments. The importance of these variables on the demand and supply of mortgages has been emphasized by Karley (2002), Boamah (2003), Asare and Whitehead (2006) and Boamah (2009). Most of these variables have economy wide implications; they impact on all asset class in the Ghanaian economy. The variables directly or indirectly influence the supply and demand of housing credit. To create a proper framework for the empirical analysis, each of the variables and their relationship with mortgage originations are discussed below.

Inflation

Inflation directly impact on nominal interest rates charged by mortgage lenders and the value of latter mortgage payments. It therefore impact on lenders risk exposure and mortgage affordability by mortgagors; it thus affect the demand and supply of housing credit. Chambers et al (2008) noted that the presence of inflation reduces the real value of the mortgage payment and the outstanding loan overtime. This exposes lenders to significant losses as they may lose the real value of their outstanding housing credits. High inflation volatility expands lenders credit, interest rate, and liquidity risks (Renaud, 2004). Savers may be reluctant to save if interest rates are negative in real terms and thus constrain mortgage lenders of the requisite funds for housing investment (Sandilands, 2002); this is possible in an inflationary environment. Miles (2004) noted that unanticipated inflation increases the risk premium and therefore the real interest rate. Sandilands (2002) also noted that high inflation rate leads to high nominal interest rates which brings about a major “front-end- loading” or cash squeeze problem for borrowers. High nominal interest rate lowers mortgage demand as the part of households’ income that has to be spent on housing finance increases

(Wolswijk, 2005). Nickell (2002) noted that high inflation rates will shift the burden of interest payments and repayments to the initial phase of the loan, with negative effects on housing credit demand. With higher inflation and nominal interest rates an increasing fraction of households will in effect be limited by their current income (Fortin and Leclerc, 2007) from accessing housing credit. A rising inflation will lead to high debt levels in relation to income and make it more difficult for new entrants to access housing credit. The demand and supply of housing credit may therefore be constrained by high inflation rates and inflation volatility.

Exchange Rate

Exchange rate affects both the demand and supply of mortgages. On the supply side, it dampens the real value of mortgage payments in relation to a stable foreign currency. Currency depreciation therefore expands mortgagees' risk of losing the value of regular mortgage payments. In order to hedge currency risk, lenders sometimes denominate mortgages in more stable foreign currencies. The practice allows the domestic inflation element to be taken out of the interest rate (Asare Whitehead, 2004). But this transfers lenders currency risk to the mortgagors; mortgagors therefore face currency and foreign interest rate risks. The resulting effect is that mortgagors face a high incremental borrowing cost in a high and volatile exchange rate environment. This constrains borrowers' ability to meet future mortgage obligations and increases default risk overtime. Currency depreciation has a constraining effect on both the supply and demand of mortgages. The currency risk faced by both lenders and borrowers is intensified by high exchange rate volatility. Anson (2005) noted that the depreciation of a local currency affects long term investments.

Interest Rate

Interest rates are an important element in the broader concept of capital costs of housing, reflecting the costs of capital invested in housing (Wolswijk, 2005). An unexpected increase in interest rate will decrease the market value of a fixed rate mortgage loan leading to significant losses to lenders. The housing finance market finances an asset whose value is usually very large relative to the borrower's existing income and so needs to be on much longer terms for it to be affordable (Sandilands, 2002), but the liabilities of lenders are primarily short term. There is therefore a maturity gap between the assets and liabilities of lenders; this may lead to rising costs on lenders liabilities relative to the returns on their outstanding housing credit. Chiquier et al

(2004) noted that lenders who rely on deposits to finance housing investment may be subjected to periodic outflows due to economic downturns or widening differentials between deposit and alternative investment rates. Lenders are therefore exposed to large unhedged interest rate risk by funding long-term fixed-rate housing loans with short term deposits. A rising interest rate leads to a rise in the interest payment obligation of institutional lenders to depositors, but the interest rate on their mortgage assets will be lower than the prevailing market interest rates in a world of fixed interest rate mortgages. This will lead to significant losses measured by the gap between the prevailing market interest rate and the interest rate on their outstanding mortgages. The interest rate problem affects both the demand and supply of housing credit. With high and volatile interest rates, borrowers find it difficult to service loans and may avoid taken loans. Fortin and Leclerc (2007) noted that a rise in interest rate disqualifies a significant number of would-be borrowers and reduces the vigour of the mortgage market. Merrill et al (2003) noted that higher prevailing interest rates make long-term borrowing prohibitively expensive for the vast majority of households, especially for the long-term lending necessary to support housing purchases. At high interest rates, most homebuyers cannot afford housing loans. Lenders on their part may tighten their mortgage lending standards (for instance via higher loan-to-value ratios) when interest rate rises. Lenders may also shift their preferences from long-term investments to short term ventures for fear of being wiped out by high interest rate volatility.

The Model Structure

By bringing together all the above variables and hypothesis, two regression equations are obtained. The first equation (model 1) is as shown below;

$$\text{MORG}_t = \beta \text{MACRO}_t + \hat{\epsilon}_t \quad (1)$$

where,

MORG_t = mortgage originations at time t

MACRO_t = either inflation rate, or interest rate, or exchange rate at time t

$\hat{\epsilon}_t$ = error term

The hypothesis to be tested is that:

$\beta = 0$ (Mortgage origination is not influenced by inflation rate, or interest rate, or exchange rate).

The second equation (model 2) is as shown below;

$$\text{MORG}_t = \beta \text{INF}_{ti} + \chi \text{ER}_{ti} + \alpha \text{INT}_{ti} + \hat{\epsilon}_t \quad (2)$$

Where;

INF_{ti} = inflation rate at time t

ER_{ti} = exchange rate at time t

INT_{ti} = interest rate at time t

$\hat{\epsilon}_t$ = error term

The subscript i indicates the cross-sectional relationship between the explanatory variables.

Model 2 test the hypothesis;

$$\beta = 0, \chi = 0, \alpha = 0$$

The Nature of the Ghanaian Macro-Economy

Over the period 1992 to 2008 inflation and interest rates were unstable in Ghana. The rates were high and showed a high degree of volatility. Inflation and interest rate moved in the same direction, indicating the strong relationship between the two variables. Over the period, inflation rates were lower than nominal interest rates, implying that lenders captured the full effect of inflation in their mortgage pricing activities. However, in 1995, inflation rates exceeded nominal interest rates, an indication that real interest rates were negative; lenders lost the real value of mortgage payments over this period. As figure 1 indicates, the high inflation rates in the country led to higher nominal interest rates.

Similarly, the Ghanaian Cedi depreciated significantly against the major international currencies (such as the US Dollar, Pound sterling, and the Euro) between 1992 and 2008. The cedi was generally weak over this period; the price of a unit of foreign currency was extremely high. Between 1992 and 2006 (14 year period) the cedi depreciated against the US dollar by 20.13 basis point. This suggests an annual depreciation of 1.44 basis point. The highest depreciation occurred in 2000 when the cedi depreciated by over 100% over 1999 figures. The Cedi however, showed some stability against the major foreign currencies between 2004 and 2006 but depreciated again from 2007.

Presentation and Analysis of Results

The models in equations (1) and (2) are estimated and the results presented in this section. Table 1 presents the results for estimating model 1 (See table 1). The regression result is unable to reject the hypothesis that β is 0 when inflation and interest rates were each employed separately as the explanatory variable in model 1. However, when exchange rate was used as the explanatory variable the hypothesis that exchange rate has no influence on mortgage origination was rejected at the 1% level of significance.

The test suggests that interest and inflation rates are insignificant in explaining mortgage originations in the country and the only important factor in explaining mortgage market activity in the country is the exchange rate (the price of US\$1 in Cedis).

Table 2 presents the results for estimating model 2. The results suggest that β and α are not statistically distinguishable from 0 at all levels of significance. Therefore, inflation rate and interest rate are insignificant in explaining mortgage originations in Ghana. However, χ is statistically significant from 0 but at the 5% level of significance. The estimated output in table 2 is consistent with that in table 1 which suggests that exchange rate is the only variable influencing the origination of mortgages in the country. Further tests of model 2 are made but with some variables eliminated; inflation and exchange rates; inflation and interest rates; and exchange rate and interest rate were employed separately as the explanatory variables in model 2. The results are reported in table 3. The result in table 3 is consistent with that of table 1 and 2 in that it also indicates that exchange rate is the only significant factor influencing mortgage market activity in Ghana.

a = t-statistic, b = p-value

The findings reflect the fact that mortgages in Ghana are denominated in foreign currencies (mostly in the United States (US) dollars) and not in the Ghanaian Cedis. This makes the exchange rate the major factor that influences mortgagees' ability and willingness to originate mortgages. The findings are also consistent with Konadu-Agyeman (2001), Karley (2002), and Akuffo (2006) who all suggested that the domestic component of the Ghanaian mortgage market is limited and that mortgagees in the country focus on Ghanaian residents abroad. The findings are also consistent with Boamah (2009), BoG (2007), Asare and Whitehead (2004) and Boamah (2003) who all suggested that resident Ghanaians have been priced out of the

mortgage market by high exchange rate levels and the associated “dollarization” of mortgages. The findings reflect the fact that most mortgagors are Ghanaians living and working abroad or with some form of foreign denominated income. It is therefore not surprising that exchange rate is the only significant factor influencing mortgage originations in the country. This class of Ghanaians earns foreign income that is able to offset the effect of domestic inflation and interest rate; and that the major factor that determines their abilities to meet mortgage payments is the exchange rate. The risk exposure of the mortgagees is linked more to the exchange rate volatility than to domestic inflation rate and volatility due to the nature and sources of income of their mortgagors.

Policy Implications of the Findings

The high and volatile exchange rate in Ghana has rendered the mortgage market unattractive to resident Ghanaians or Ghanaians with cedi denominated income. The domestic component of the housing finance market in Ghana remains underdeveloped because of the high and volatile exchange rates in the country which have accordingly priced out most locally based mortgagors and have made most resident Ghanaians apprehensive about housing credit. Resident Ghanaians fear that they will become perpetually indebted by taken mortgages. The continuous depreciation of the Ghanaian Cedi to the major foreign currencies has led to a situation where mortgages are denominated in foreign currency notably the US dollar. This process exposes mortgagors depending on Cedi income to high incremental borrowing cost over the mortgage life. Ghanaian based mortgagors are therefore mostly concerned about their abilities to ever redeem the mortgaged property. This is partly responsible for the virtually no local participation in the country’s mortgage market. The mortgagors perceive housing credit as unaffordable.

The mortgage market has therefore developed with mortgagees focusing on non-resident Ghanaians or Ghanaians with foreign currency denominated income. The active participation of the non-resident Ghanaians in the country’s housing finance market is not bad in itself, since it provides requisite funds to lenders and also serves as a source of foreign exchange to the Ghanaian economy. But this segment of the market must not be developed at the expense of the domestic segment of the housing finance market; both segments of the mortgage market must be developed. It is therefore important for policy-makers to focus on addressing the exchange rate problem. This will make it possible or attractive for lenders to

denominate mortgages in the Ghanaian cedi and thus make it possible for resident Ghanaians or Ghanaians depending on cedi income to participate actively in the housing finance market. Stable and low exchange rate will reduce the currency risk assumed by lenders and therefore makes it possible for mortgagees to price mortgages in the domestic currency instead of pricing it in some foreign currency. Pricing mortgages in the local currency will reduce the incremental borrowing cost that mortgagors may face by taken foreign currency denominated mortgages. This will ensure that mortgages are affordable to mortgagors and reduce their apprehension about the use of the mortgage to finance home purchase.

Conclusion

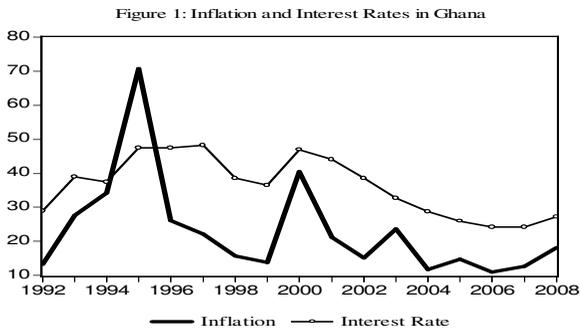
The macro-economic environment of Ghana is weak and unstable; this has had a negative impact on the development of the country's housing finance market. The study found exchange rate as the major macro-economic factor influencing mortgage originations in the country. This is not surprising since mortgagees in the country originate basically for non-resident Ghanaians and Ghanaians with foreign denominated income. Due to the high exchange rate and the "dollarization" of mortgages in the country, the mortgage market has been rendered uninviting to resident Ghanaians. The high exchange rate levels and volatility have hindered the entry of most Ghanaian homebuyers to the housing finance market. There is therefore, virtually no participation of resident Ghanaians in the country's mortgage market. It is important for policy-makers to focus on addressing the exchange rate problem so as to make the mortgage market attractive to both borrowers and lenders. This will ensure that resident Ghanaians participate fully in the country's mortgage market and thus help address the housing finance problems of the country.

References

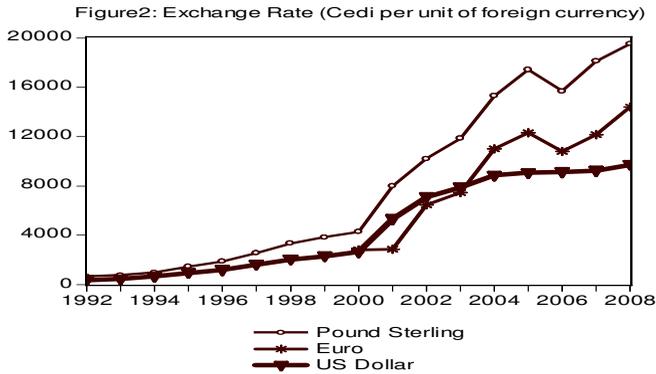
- Akuffo, A. (2006). HFC'S Pioneering Role and Rational for Conversion to Full Banking Activities: Sustainability of Specialised Lenders. The World Bank/International Finance Corporation (IFC), Housing Finance Conference, 16-17 March, Washing DC, USA.
- Asare, E. L. and Whitehead, C. (2006), "Formal mortgage markets in Ghana: nature and implications", RICS Research paper series, Volume 6, Number 13, October 2006
- Bank of Ghana (2004-2008). Statistical Bulletin (various issues). Accra: BoG

- Bank of Ghana (2007). The Housing Industry in Ghana: Prospects and Challenges, Bank of Ghana Policy Briefing Paper. Accra: BoG
- Boamah, N.A. (2003), The Impact of Liberalisation on Residential Property Financing in Ghana, Unpublished MPhil Thesis, Department of Land Economy, University of Cambridge-UK.
- Boamah N.A. (2009). “Secondary Mortgage Market Market (SMM): Is it Right for Financing Housing in Ghana?”, *Journal of Science and Technology*, Vol.29, No. 1.
- Chambers, M.S., Garriga, C., Schlagenhauf, D. (2008). “The Loan Structure and Housing Tenure Decisions in an Equilibrium Model of Mortgage Choice”, FRB of St. Louis, *Working Paper*, No. 2008-024A
- Chiquier, L., Hassler, O. and Lea, M. (2004). “Mortgage Securities in Emerging Markets” The World Bank, Policy Research Working Paper 3370, August.
- Ghana Statistical Service (2005). Population Data Analysis Report, Policy Implications of Population Trends, Vol.2. Accra: GSS
- Ghana Statistical Service (2007). Ghana in Figures. Accra: GSS
- Gyamfi-Yeboah, F. and Boamah, N. A. (2003). “Towards a Sustainable Mortgage Market in Ghana”, *Ghana Review International*, September, 2003.
- Karley, N. K. (2002), “Alternative Options to Mortgages in Ghana”, *Housing Finance International*, Vol. XVII /No.2: 26-30, December 2002
- Konadu-Agyeman, K. (2001). The Political Economy of Housing and Urban Development in Africa: Ghana’s Experience from Colonial Times to 1998. Praeger Publishers, Westport.
- Proxenos, S. and Taff, L.G. (2003). “Mortgage Models, Interest Rate Risk, and the Consumer: a Four Country Comparison”, *Housing Finance International*, March, 2003.
- Renaud, B.M. (2004). “Mortgage Finance in Emerging Markets: Constraints on Feasible Development Paths”, USC FBEL/LUSK Real Estate Seminar, November, 2004.

- Richupan, S. (1999). “Macroeconomic Instability and Housing Finance: Thailand's Experience”, *Housing Finance International*, December, 1999.
- Sacks, P., Merrill, S., and Rabenhorst, C., (2003). “Developing Secondary Mortgage Markets in Southeast Europe: Assessment of the Mortgage Markets in Romania”, UI Project 06940-001, January 2003
- Sandilands, R.J. (2002). “How To Motivate Faster Growth in Colombia: The Leading Sector Strategy Revisited”, Estudios Gerenciales.
- Waigel, T. (2000). “Economic Challenges to Housing Finance”, *Housing Finance International*, March, 2000.
- Warnock, V.C. and Warnock, F.E. (2008). “Markets and Housing Finance” Hong Kong Institute for Monetary Policy, Working Paper No. 3/2008
- Wolswijk, G. (2005). “Some Fiscal Effects on Mortgage Debt Growth in the EU”, European Central Bank, *Working Paper Series*, NO. 526, September, 2005.



Source: World Economic Outlook Database (2008); Ghana Statistical Service (2005, 2007)



Source: Ghana Statistical Service (GSS), (2005); Bank of Ghana (2004-2008)

Table 1: Regression Results for Model 1

Estimated Equation: $MORG_t = \beta MACRO_t + \epsilon_t$					
Data range: 1992 to 2008					
Dependent Variable	Regressors	β	t-statistic	p	R^2
Mortgage Originations	Inflation Rate	572.13	1.8684	0.0828	0.1996
	Interest Rate	1020.29	1.8729	0.0821	0.2004
	Exchange Rate	-0.0347	-3.2485	0.0058	0.4298

Table 2: Regression Results for Estimating Model 2

Estimated Equation: $MORG_{it} = \beta INF_{it} + \chi ER_{it} + \alpha INT_{it} + \epsilon_{it}$				
Data range: 1992-2007				
Dependent Variable	Regressors	Regression Coefficients	t-statistic	p-value
Mortgage Originations	Inflation Rate	$\beta = 262.41$	0.74911	0.4682
	Exchange Rate	$\chi = -0.0303$	-2.1986	0.0483
	Interest Rate	$\alpha = -23.46$	-0.0342	0.9733
$R^2 = 0.4624$				

Table 3: Regression Results for Estimating Model 2 (for some selected variables)

Estimated Equation	Independent Variables			
	Inflation Rate	Interest Rate	Exchange Rate	R ²
$MORG_t = \beta INF_{it} + \chi ER_{it} + \hat{\epsilon}_t$	$\beta = 256.28$ 0.88678 ^a 0.3914 ^b		$\chi = -0.0301$ -2.2038 ^a 0.0256 ^b	0.4623
$MORG_t = \beta INF_{it} + \alpha INT_{it} + \hat{\epsilon}_t$	$\beta = 350$ 0.8851 ^a 0.3922 ^b	$\alpha = 629.10$ 0.8925 ^a 0.3883 ^b		0.2458
$MORG_t = \chi ER_{it} + \alpha INT_{it} + \hat{\epsilon}_t$		$\alpha = 240.18$ 0.4143 ^a 0.6854 ^b	$\chi = -0.0315$ -2.3392 ^a 0.0359 ^b	0.4372

Table 4: Descriptive Statistics

	Mortgage Originations	Inflation Rate	Interest Rate	Exchange Rate
Mean	290.8125	23.10418	36.26471	5311.888
Standard Deviation	195.2742	14.81906	8.613884	3982.632
Maximum	824.0000	70.81700	48.25000	12141.00
Minimum	82.00000	10.92300	24.25000	437.0900