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A Review of Selected New Financial Instruments in Ghana

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**Clifford Mpare
Sigma One Corporation**

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4.10 Evaluation of innovative financial instruments into financial markets

July 2003

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**A Review of Selected New Financial Instruments and
Structures in Ghana**

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DRAFT (DC)

A Review of Selected New Financial Instruments and Structures

Inflation-Indexed Bonds (IIBs), Venture Capital Funds (VCF) and Real Estate Investment Trust Funds (REIT) represent three of the most significant innovations in the financial sector in Ghana in the last 10 years. These financial innovations were viewed as a panacea for the financial sector when they were first introduced, but they have not lived up to expectations. Together, they have had minimal impact on the economy; their transaction sizes have been small and return on investment results has been mixed. While it may be easy to blame the unstable, macroeconomic environment for the failure of these new financial instruments to deliver on their promise, I believe there are a number of other factors that account for their poor performance. These other factors are more within the control of market participants, and can therefore be analyzed and corrected within a reasonable time frame. In this document, I will address some of the factors that have served to hinder the growth of innovative financial instruments, and will offer some recommendations.

GGILB – The Misunderstood Security

A number of market participants have criticized the Government of Ghana Index-Linked Bond (GGILB) since it was introduced to the market in September 2001, because they believe it has a design flaw. Others have vehemently argued that the yield on the instrument is artificially capped, and that it therefore deprives investors of the opportunity to realize a true return on their investment. Having analyzed the GGILB, I did not find either statement to be true. However, it is apparent that the GGILB has a credibility problem, which can only be corrected through proper education concerning, and understanding of, the structure of the GGILB.

After reviewing the structure and characteristics of the GGILB, my observation is that it is not dramatically different from other Inflation-Indexed bonds in other countries. Indeed, there are no major differences between the GGILB and other IIBs. One of the least understood issues about the GGILB relates to the determination of the real interest rate. In Canada and the US, the real rate on any Inflation-Indexed bond is determined by its implied yield at auction.

The recent real rate on the GGILB has been between 5% and 6%. There is no government policy on fixing the yield on the GGILB at a predetermined rate. The GGILB Memorandum (the operating document of the instrument) does not explicitly address this issue. But according to the Bank of Ghana (BOG), the real coupon rate on the GGILB is derived from bids submitted at auction. Incidentally, this is not different from the practice elsewhere. Exhibit 1 shows that, from 1990 to 2000, the real interest rate in Ghana averaged 6.3%, which is consistent with the current GGILB real rate. A legitimate criticism of the GGILB is that there is no comparable duration-equivalent, conventional bond that would allow an investor to make an informed investment decision between competing instruments. The investor is only given one option on his/her investment; that is, to buy and hold the security until maturity.

An important benefit often touted as a reason for issuing Inflation-Indexed bonds, is that they can provide an objective reading on inflation expectations. This is obviously not true in the case of the GGILB, since there is no active trading. Nevertheless, the GGILB is an attractive instrument that should provide a benefit to investors who wish to hold a long-term asset with a fixed, long-term, real yield that is free from inflation risk. Although an investor seeking an

asset that is risk less in real terms at a long horizon can roll over the 91-day Bill, the dilemma the investor faces is that returns on this rollover strategy are risky because they are exposed to variations in real interest rates.

Throughout the history of Ghana, there have been periods of negative real yields. Therefore, one of the benefits of the GGILB innovation is that it can give the type of protection to long-term investors available only in stable macroeconomic environments (see exhibit 1). Table 1 confirms that the structure of the GGILB is quite similar to IIBs in other countries. Clearly, the structure and design of the GGILB is not the reason for its lack of success. Instead, there are structural impediments in the financial sector that continue to affect the proper functioning of the Bond Market in general and in particular the GGILB. (Note: the Bond Market Committee has made recommendations to resolve most of the structural impediments in the Market. The differences between the Bond Market Committee's recommendations and the recommendations submitted by Tom Campbell should be reconciled and implemented.)

Table 1- Inflation-Indexed Comparison

Ideal Inflation-Indexed Model	Practice in Ghana
Characteristics and Structure	
Fixed real coupon, paid semi-annually on inflation adjusted principal. Coupon determined at auction	Similar Practice
Principal is adjusted for inflation daily, but paid at maturity	Similar Practice
The index ratio for a particular valuation date is the index number for that date divided by the index number for the issue date	Similar Practice
Index Ratio _{Date} = $\frac{\text{Index number for value date}}{\text{Index number for dated date}}$	Similar Practice
Deflation-protected principal at maturity	Principal will never dip below original priced
Inflation accretion is referenced to the CPI - set with a three month lag	Similar Practice
First issued in the US in 1997 and Canada in 1991	Issued in 2001
Strong secondary market activity; in the US and other countries, the TIPS (US) has a daily volume of \$2 Billion – Taxable	Only one trade in the GGILB has so far been recorded; Tax Exempt - individuals

Because of a lack of understanding of the GGILB and the narrowness of the Bond Market, secondary market trading has been almost non-existent. Furthermore, the high, secondary reserve requirement imposed on the banks has created a disincentive to trading. As a result, investors have accepted the Buy and Hold strategy of investing in the Bond to avoid dealing with the perceived complexity in valuing and trading the security. One simple solution to address this is to aggressively educate the decision-makers who buy the Bonds and dispel the negative notions associated with valuing and trading the security.

Market Trading and Pricing of the GGILB

The following analysis may assist practitioners in gaining a better understanding of the valuation and trading of IIBs. While this analysis is not specific to the GGILB, I believe it can be applied to the GGILB. In developing our analysis, we have made certain assumptions, including 1) there is adequate secondary market trading, and 2) there are available competing instruments in the market.

The theoretical basis of valuing any security is the present value of all the cash flows the security is expected to provide in the future. Most investors are accustomed to trading securities in nominal terms and quoting yields-to-maturity (IRR) as nominal rates. The reason conventional bond valuation does not appear intimidating, is the fact that the nominal cash flows are known in advance, thus the yield-to-maturity can be calculated easily. The only uncertainty with a nominal bond is the purchasing power of the future cash flow and (because of inflation) this may not be known today (see Table 2). The opposite is true of the GGILB: its future nominal cash flows are not known, but its inflation-adjusted cash flows are fixed. As a result, it is natural to quote the yield to maturity in real terms (see Table 3).

Table 2 – 3-year Conventional Bond with a coupon rate of 34%

Date	Principal	Nominal Interest Payments	CPI Index
February 15, 2001	-1,000,000		100.00
February 15, 2002		170,000	130.00
February 15, 2003		170,000	169.00
February 15, 2004	-1,000,000	170,000	219.70

Table 3 – A 3-year IIB with 4% real coupon rate and inflation of 30% a year

Date	Principal	Inflation Adjusted Interest Payments	CPI Index Base=100
February 15, 2001	-1,000,000		100.00
February 15, 2002		52,000	130.00
February 15, 2003		67,600	169.00
February 15, 2004	-2,197,000	87,880	219.70

Let us consider the following: assume that the Bank of Ghana (on behalf of the MOF) issues a 4% coupon, 3-year GGILB on February 15, 2001 at par (see Table 3). A buyer is willing to pay 100% of the principal amount, 1,000,000 cedis. Further assume that the buyer is expecting annual compound inflation of 30% per year during the life of the security, and that he/she would be indifferent to the choice between buying this GGILB and buying an equal-duration Conventional Treasury Security.

Suppose the investor wants to sell the GGILB on February 15, 2002 (after collecting the first full-year coupon interest payment). What will be the appropriate price for his/her to exit the position? The cedi equivalent of the investor's principal is 100% times the original principal.

which is $P_1/P_2 \times 1,000,000$. If inflation were 30% over the past year (ignoring the index lag), then $P_1/P_2 = 1.30$, and the principal of the security is 1,300,000 cedis.

Now suppose the Treasury has just issued a new 2-year GGILB (that is a new bond maturing in 2004 with a coupon rate of 4.50%). Assume that the auction price of this new 2-year GGILB was at 100% (ignoring commission and spread); the investor's "old" GGILB must compete with the supply of the "new" GGILB that has a higher coupon rate of interest. It is clear that there can be no arbitrage trading in the two securities, thus the investor cannot receive the notional principal of the original security of 1,300,000 cedis, nor can he/she receive the 1,000,000 cedis – the principal value of the new GGILB, because the new security is paying a higher coupon.

In order to calculate the investor's proceed from selling, we should assume that the calculation of the index bond is similar to the calculation of a conventional bond. Each cash flow the security will deliver in the future (interest payment and the return of the inflation-adjusted principal) must be discounted to the present, at the rate implied by a comparable security selling at par.

In order to achieve equilibrium, the new 2-year GGILB with a real coupon of 4.50% will provide the investor of the old GGILB the discount rate to use to determine a fair value. Assuming an inflation rate of 30%, then the nominal yield-to-maturity on the GGILB will be 26.75% (assume the bond pays interest twice a year). If we apply this yield-to-maturity to the old bond, the price of the security turns out to be 989,000 cedis. The seller's one-year return from owning this security is $(52000 + 989,000) / (1,000,000 \text{ cedis})$ or 4.1% real return. The buyer will expect to earn the 4.50% real yield to maturity on the repriced security – plus the inflation rate during the remaining life of the security (30%) plus a small compound bonus.

From the example above, it is clear that liquidity in the Secondary market is an essential catalyst in the development and acceptance of innovative financial instruments. I strongly recommend the introduction of additional inflation-indexed bonds, along with the duration-equivalent, conventional bonds in the very near future. This will allow for a cost-effective means for investors to assess their risk/return profile and transfer risk when necessary.

IIB Performance under different inflation scenarios

Another way to analyze Inflation-Indexed bonds, is to observe how they perform relative to conventional bonds in various inflation and interest rate scenarios. I will discuss four scenarios presented in a study by Johnson and Widyawan (2001). Evidence from the United States is used since there is no meaningful trading history on the GGILB and there are no long-term, conventional bonds in Ghana. (We strongly suggested the introduction of a conventional, 3-year bond and gave our rationale for the recommendation in an earlier paper: REFERENCE TO PAPER? ... Mr. Sattar)

When we analyzed this issue in July 2002, headline inflation in Ghana was trending lower and was expected to settle at around 15% (year-end inflation for 2002 was 13.7%). As a result, it was believed that the Government had engineered the introduction of the GGILB to save the cost of its debt issuance.

The argument was that, if inflation declined over the maturity of the GGILB, the government would save money by paying lower interest costs. By contrast, investors would get lower

yields. Under this scenario, investors would have been in a far better situation, had they bought old-fashioned Treasury Bills and perhaps rolled them over every 91 days. In my review of the GGILB instruments at that time, I pointed out that the commercial banks were experiencing some financial strain as a result of being forced to purchase the GGILB to fulfill secondary reserve requirements. This situation was compounded by the fact there was no early exit strategy for the banks.

However, because of the unanticipated rise in inflation in 2003, the situation has been reversed one year later. It is the government that appears to be under duress (in reality the government is not a person; therefore, tax payers will have to bear the cost eventually, through higher taxes or reduced government benefits). The semi-annual interest payments on the GGILB have risen, commensurate with the rise in inflation. The banks, on the other hand, have benefited from the inflation protection promised by the GGILB. The most opportune time for the government to introduce IIBs, from a practical point of view, is when inflation has peaked and is trending down and not the other way around.

The former British Prime Minister, Margaret Thatcher, made an accurate observation along these lines that the rationale for introducing IIBs is to ensure that the government polices itself. She suggested that, like a "sleeping policeman", Inflation-Indexed bonds helped control inflation, by creating a situation whereby the government would have to face a large interest expense if it ever allowed inflation to pick-up or get out of control.

IIB Behavior under Different Inflation Scenarios

In a study comparing the performance of a Hypothetical Inflation-Indexed Bond with the comparable 10-year Conventional Bond over four different inflation periods, Johnson and Widyawan (2001) observed different performance patterns under different inflation scenarios. Although we cannot apply the study directly to Ghana, because of the lack of a comparable, long-term Conventional Bonds, we believe the study can serve as an important education tool for practitioners who want to understand the likely behavior of the GGILB under different inflation scenarios, and accordingly devise the appropriate investment strategies.

Scenario 1 - Low and increasing inflation rate

The study found that, in a period of moderately-increasing inflation, the Inflation-Indexed bond out-performed the conventional bond by an average of 27.49% before taxes.

Scenario 2 -- High and volatile inflation rate

The study found that this was the best period to invest in Inflation-Indexed Bonds. The Inflation-Indexed bond holding-period return was on average 46.27% higher than the Conventional bond

Scenario 3 -- High and decreasing inflation rate

The study found that the conventional bond outperformed the Inflation-Indexed bond. The average out-performance of the Inflation-Indexed bond, versus the Conventional bond for the period, was 30.27% before taxes.

Scenario 4 – Medium and decreasing inflation rate

The study found that, during this period, the Inflation-Indexed bond out-performed the Conventional bond.

Based on the four scenarios described above, the IIBs appear to perform better when inflation rate is high and increasing. On the other hand, a low and declining inflation rate will lower the return on IIBs and possibly lead to the conventional bond outperforming the IIB.

Real Estate Investment Trust

Home Finance Company introduced the country's first REIT instrument (1995). The HFC REIT remains the only REIT in the country today. It is however limited in scope because it is illiquid and not publicly traded on an exchange. The total Fund value at the end of December, 2002 was 22 Billion cedis. Over the last 6 years, the Fund has achieved decent results but its growth has been stymied by legal difficulties. Generally, the REIT sector has been slow to develop because of the rigidity of Property and Land laws in Ghana.

The Mortgage Decree of 1972, which requires a mortgagee to obtain a court order before selling mortgaged property, is an example of a law that makes property ownership difficult in Ghana. This law should be amended or repelled because it is cumbersome and puts an undue burden on the seller. Likewise, the Home Finance Law of 1993 (which allows HFC to enforce mortgages of defaulting customers without court order, except in cases where such mortgagors have settled at least 85% of their obligations to HFC) should be amended to cover all other financial institutions engaged in mortgage financing.

In the long run, the financial sector in Ghana would benefit from a coordinated effort to introduce Real Estate Investment Trusts (REITs). The rationale for developing liquid and tradable REIT Funds is similar to the rationale for creating unit trust funds. They allow investors to participate in an economic sector with limited fund commitment. With the impending introduction of unit trust funds in Ghana, and legislation to set up Long Term Savings investment vehicles, it is appropriate and timely to consider REITs as well. REITs may actually have a more profound impact on the economy than mutual funds because of the widespread use of real estate in building wealth in Ghana.

With credit and capital largely unavailable to private real estate companies in Ghana, the best and most efficient way for the private real estate companies to access capital may be through the public market place. REITs can make the accessibility to income-producing commercial real estate a reality for all investors. REITs can help turn real estate liquid by providing a vehicle that enables investors to buy or sell shares of diversified portfolios of properties. If they are structured similarly to the US model, publicly -traded REITs in Ghana could provide many benefits including:

1. A pass-through profit feature, which enables the REIT to distribute the majority of its cash flow to investors without taxation at the corporate level.
2. A more flexible capital structure than privately-owned real estate investments firms.
3. A secure and liquid investment option for small investors who want to invest in the real estate market.
4. Better access to credit and capital.

Until proper attention is given to property and land law reforms that will makes property ownership and land title an undisputed right, the REIT market will not flourish in Ghana. Along the same lines, despite the merits of establishing a quasi-government owned entity (National Mortgage and Housing Company) to facilitate home ownership and develop a mortgage-backed securities market, this effort will not succeed unless the proper attention is given to reforming the current property and land laws.

Venture Capital Funds

Venture Capital Funds have been part of the financial landscape of Ghana for over 30 years (the public equity market in Ghana was established in 1991). In 1970, SSNIT established the first Venture Capital Fund with a capitalization of approximately \$50 million to invest in private enterprises. The Ghana Venture Capital Fund was established in 1992 with capital of \$5.8 million, while the Enterprise Fund was established in 1997 with capital of \$4 million. Because of the small size of the Venture Capital Funds, relative to the size of Ghana's economy, their impact has been insignificant. Political meddling and lack of operational controls have also contributed to the poor investment performance of the Funds.

Recently, there has been renewed interest in establishing more Venture Capital Funds in Ghana to facilitate the development of the private sector. More importantly, foreign government agencies and multinational institutions are increasing their sponsorship of Venture Capital Funds in developing countries every year. Additionally, there are other sources of private equity funds flowing into developing nations. These are primarily US pension funds, corporations, insurance companies and high net worth individuals. For the country to be looked at favorably by the sponsoring agencies and funding entities, it is imperative for Ghana to immediately put into place systems and structures that will make venture capital funds perform well.

The following suggestions may help Ghana to prepare for the bidding process:

- Improve transparency in business practices
- Increase the number of projects, capable of investment, that can be used to build a private equity portfolio
- Increase the number of investment managers with previous venture capital experience
- Establish educational programs to train potential venture capital investment managers
- Development financial instruments such as preferred stocks, corporate debt and convertible ??? (convertible what?) preferred to ensure the proper structuring of deals.

Unlike the US, where Venture Capital Funds tend to concentrate in narrow sectors (for example, technology), it is important not to limit the investment mandates in Ghana, but to broaden the mandates to give the investment managers a more complete opportunity set from which to invest. This will improve portfolio performance and the information ratio derived from investing the funds.

The Overseas Private Investment Corporation (OPIC) model has proven to be a profitable model for the United States government. There is no reason that the Ghana government cannot emulate this model. The essence of the OPIC model is to use the government as a facilitator in the mobilization of capital for use in the private sector. Although this involves a partnership between the public and private sector, the government's role is typically minimized when it comes to the implementation and execution of the investment process. By

using the safety rating of the US government, a Venture Capital Fund can be leveraged 2 to 3 times to provide more capital to the private sector. I will recommend further study of the OPIC Model as a first step in designing a model for the government, especially given the momentum of the new initiative to develop venture capital funds in Ghana.

Conclusion

It is widely acknowledged that the proper role of government is to provide public good. By facilitating and taking the lead on potential new financial markets and instruments, the Ghana government can fulfill this all important public mission. The private sector tends to undersupply new financial instruments because of the cost associated with advertising, promoting and marketing a new product. So, if there is a slowness in developing the secondary market for the GGILB (because there is a feeling among market participants that the security is unproven and untested), then it is up to the government or the Bank of Ghana to jump start the process by providing secondary market liquidity. In a way, it is good public policy because the success of the GGILB and other financial instrument innovation will contribute to efficiency, productivity, stability and equity in the economy.

Final Thoughts: The conference at Elmina Beach (detail?) was well attended and had its share of energy, as well as a desire by participants to get things done. Nevertheless, participants showed the strain of endless meetings to discuss and solve well-documented problems in the financial sector. It was obvious to me that most believed that the time had come to put a credible plan into action. Participants were generally supportive of the recommendations that emerged from the various working groups. The Financial Sector Strategic Plan document (detail?) is both comprehensive and well thought-out. It served as an appropriate tool and compass during the deliberations. I suggest that a small group should begin work immediately to prioritize the recommendations and develop an action plan to execute such recommendations.

Exhibit 1. Budget Deficits and Selected indicators of Macroeconomic Instability



Source: IMF and Bank of Ghana

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