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A GGE ANALYSIS OF THE POTENTIAL CONSEQUENCES OF HIGHER FOOD PRICES FOR THE BOTSWANA ECONOMY

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Abstract: Higher prices of food items are adverse terms-of-trade shocks that expectedly have severe impact on the Botswana since it is a net importer of food. The short-run consequences of rising world prices are investigated in this paper using a computable general equilibrium (CGE) model that has been parameterised to Botswana database. The simulation results indicate that the current food-price shocks are stalling economic recovery, contributing to unemployment and loss in welfare. The loss in welfare is largest for rural households. The production and consumption structure, agricultural sector supply response and exports supply responses emerge as important determinants of the size of the adjustment costs.

INTRODUCTION

Botswana has been witnessing unprecedentedly higher prices of food items since 2008. Recent data released by Central Statistics Office (2011) reveals that the food price index rose by 20% from 112.5 in 2007 to 135.5 in 2008, by 12 % in 2009 and by 5% in the 10 months of 2011. Botswana Institute of Development Policy Analysis (BIDPA, 2010), Grynberg and Motswapong (2009) and Central Statistics Office (CSO, 2009) argued that the recent higher prices of food items are mainly due to rising world prices. Several reasons advanced for explaining the current high world food prices include global warming, increase in fuel prices and the shift to food-grain fed bio-fuels largely due to subsidies provided by major food exporting countries. Owing to these structural forces, food prices are forecasted by leading international institutions including International Monetary fund (IMF, 2011) to remain elevated for a sustained period or even increase in future. According to Grynberg and Motswapong (2009), increases in world food prices are not entirely transmitted to domestic prices. Because of their sheer magnitudes and duration, current higher food prices are expectedly transmitted to non-food prices. This may happen, for example, through higher wage demands (IMF, 2011). Thus, they are likely to be affecting relative prices and to be reverberating throughout the entire economy.

The motivation for this is the expressed concern that these phenomenal increases in prices of food items are stalling economic growth, hampering employment generation and diversification efforts and reversing the progress made in the reduction of both the level and severity of poverty in Botswana. Indeed, theoretical evidence from Devarajan's *et al* (1990) analysis of adverse terms-of-trade in the form of a rise in the world import price using a stylised trade-focused model suggests that the concern about higher food prices having the adverse socio-economic impact is founded. In their theoretical framework, a rise in the import price requires a food importer to curtail imports of food or of other goods, export more in order to pay for the more expensive imports or to borrow. The costs to the economy hinge crucially on both trade shares and elasticities as well as on the macroeconomic structure. Arndt *et al* (2008), IMF (2011), World Bank (2011) argue that the economic impact is also dependent upon the share of food in consumption, structure of production and consumption at household level, the extent of both agricultural and export supply responses.

There are good *a priori* reasons to expect higher food prices to be even more damaging for Botswana. First, the country is a net importer of food items. It imports over half of its maize and sor-

ghum requirements and the entire requirements of other staple food items including rice, wheat flour and sugar (Grynberg and Motswapong, 2009; BIDPA, 2009). Second, it has a high food share of over 20% in the CPI consumption basket (CSO, 2009). And third, both rural and urban households are net food consumer or buyers.

The second motivation for this is that research efforts in Botswana, mainly by BIDPA Staffs, have so far not addressed the concern about the impact of food prices in detail. Instead, the focus has been on the pass-through of world prices to domestic prices and on analysis of the food markets. The analyses of food price increases in the consulted literature on Botswana have been cast in partial-equilibrium setting.

This paper examines the ramifications of higher food prices on the Botswana economy. The method used is to undertake food-price simulations with a single-period and comparative-static computable general equilibrium (CGE) model for Botswana. A CGE modelling approach has been chosen because the food-price shocks that Botswana is currently witnessing are so large that both the first-order and second-order effects are more likely to be substantial. In addition, the macro-economic dimensions of the current food prices are also likely to be important. This modelling framework permits both the first-order and second-order effects and macro-economic dimensions of food-price shocks to be captured. This research, therefore, compliments the previous research efforts, particularly BIDPA's, that are cast in partial equilibrium setting.

The remainder of this paper proceeds as follows. Section 2 presents the main database for the model and section 3 presents the CGE model used to obtain the results reported in this paper. The presentation focuses on those aspects that are super-imposed in order to capture the socio-economic features of Botswana. Section 4 constructs the simulations and reports the results whilst section 5 contains the concluding remarks.

DATABASE

BOT-CGE is calibrated with the most recent comprehensive and consistent database from the Social Accounting Matrix (SAM) for Botswana in 2004/05 that has been produced for the Global Trade Analysis Project (GTAP). This SAM has two accounts for food-producing industries, which are the agricultural and the food processing, and two separate accounts for food commodities, which are the agricultural and processed food. There also 15 accounts for non-food producing industries, 19 for non-food commodities and one account each for the 6 primary factors, which are administrative employees, skilled labour, unskilled labour, professional and technical employees, farm workers and capital. And there are 6 accounts for institutions/transaction groups, of which 3 are for households and one each for government, enterprises, savings-investment and the rest of the world. Thus, this SAM records information on expenditure on food items by activities and institutions and on the supplies of food items from domestic production and imports. To an extent that this SAM contains detailed supply and use matrix for food and for non-food sectors and income-expenditure accounts for institutions, it supports development of models that can sufficient analysis of food-price shocks.

Some unique socio-economic features of Botswana emanating from this database are that: (i) some industries produce multiple commodities and some commodities are produced by multiple industries; and (ii) there are some domestically produced commodities that are exported and not consumed domestically like diamonds, competitive imports and non-competitive import commodities. Other stylised features of the Botswana economy that are captured by this database include the prevalence of subsistence consumption and unemployment of unskilled labour whilst capital and skilled types of labour are in short supply. The superseding section documents how the CGE model

used captures economic flows recorded in the SAM database, ensures that income and expenditure for each actor are always balanced and how it adequately represents the socio-economic structure of Botswana.

CGE MODEL

CGE models are a class of multi-sectoral and price endogenous models that are based on actual transactions and that simulate the workings of market economies. Their distinguishing feature is that optimisers respond to relative prices, i.e., changes in relative prices signal to agents the need for altering their production, trade and consumption patterns. Their other distinctive feature is that the behaviour of core agents are derived from constrained optimisation problems as economic theory requires. For these reasons, a CGE modelling framework is used.

The CGE model, hereafter referred to as BOT-CGE, used is an adaptation of the modified version of the standard CGE model by (McDonald, 2002). As mentioned *inter alia*, BOT-CGE is built around the SAM framework. Hence, it maintains the accounting relationships in the SAM so that income and expenditure for each actor are always balanced and adequately captures the socio-economic structure of the Botswana economy. Furthermore, BOT-CGE's counterfactual is clearly known. The counterfactual for BOT-CGE is its base-run equilibrium solution values that reproduce the SAM database that is calibrated with. Within BOT-CGE, a payment from one agent to another actor affects the budget of the recipient, who then spends the additional income according to some behavioural rule. In the BOT-CGE, producers are assumed to maximise profits and households maximises utility. Also, it is assumed that Botswana is a world-price taker and consumers differentiate between the imported and domestic commodities and between exported and domestically sold commodities.

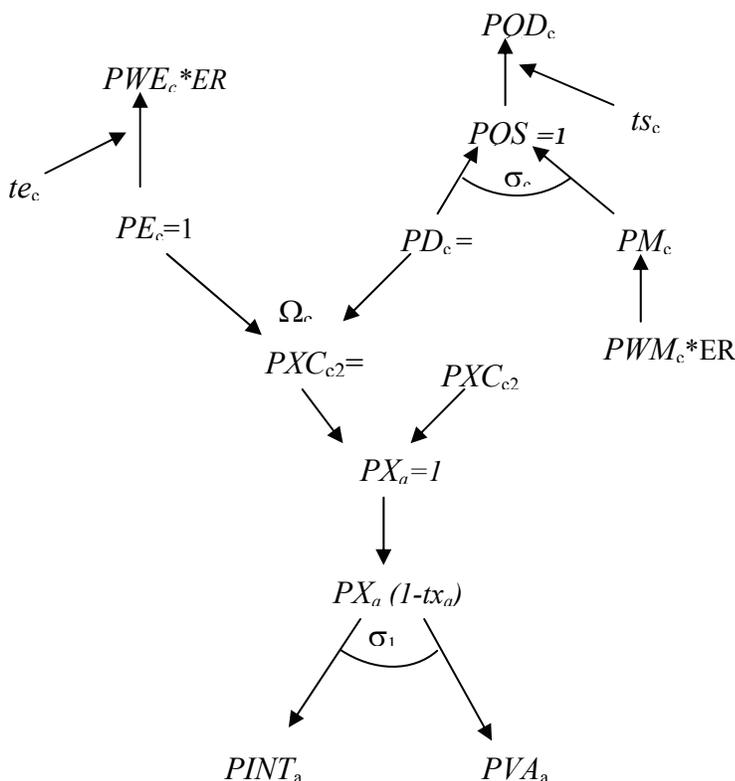
PRICE SYSTEM

Since the focus in this paper is on the impact of world food-price shocks, it is instructive to model how changes in world prices are transmitted into the domestic economy. Figure 1 illustrates how the price system is modelled in BOT-CGE. As seen, the average composite good prices ($PQSc$) are constant elasticity of substitution (CES) aggregations of the prices of domestic commodities (PDc) and domestic prices of imports (PMc). The domestic prices of imports are products of the world prices of imports ($PWMc$), valued at border prices, and the nominal exchange rate (ER) uplifted by *ad valorem* import duties (tm_c). The world prices of both imports and exports are fixed as per the small-country assumption. In contrast, the prices of domestic commodities (PDc) are determined by the forces of supply and demand in the domestic markets. The consumer prices of the composite goods ($PQCc$) are obtained by uplifting the supply prices of composite goods by the fixed *ad valorem* sales taxes (ts_c).

Similarly, the producer prices of composite output (PXC) are constant elasticity of transformation (CET) aggregations of the commodities sold in domestic (PDc) and in exports (PEc) markets. The domestic prices of export commodities are themselves products of the fixed world price of export commodities f. o. b. ($PWEc$) and the exchange rate less fixed *ad valorem* export duty rates (te_c). The average price per unit of output received by an industry (PXa) are weighted average of the domestic producer prices ($PXAC_{c,a}$) and are equal to producer prices of composite output (PXC). Activities pay production taxes to the government at *ad valorem* tax rate (tx_a). Net activity prices ($PXa*(1-tx_a)$) are distributed between the amount available to pay primary factors ($PVAa$) and the amount available to paying intermediate inputs ($PINTa$). Finally, the prices of value added are CES functions of wages and price of capital.

In figure 1, Ω and σ are import and export elasticities. To an extent that the consumer prices and activity prices of traded goods are both influenced by the world prices, exchange rate and the degree of substitutability, the domestic price system has some degree of independence from international prices. Therefore, world food prices are partially transmitted to the economy as empirical evidence suggests. The extent of the pass-through of world prices will hinge crucially on the values adopted for the trade elasticities.

Figure 1: Price system for BOT-CGE



PRODUCTION

In BOT-CGE, activities are assumed to use multiple inputs and maximise profits subject to production technologies. The optimisation problem is kept computationally manageable by invoking Hicks’ (1946) separability assumption. Accordingly, the production technologies are captured using a two-nested production functions. At the top-nest, activities’ outputs are produced by combining value added and aggregate intermediate using constant elasticity of substitution (CES) functions. At the second-nest, value added is a CES aggregator function of multiple primary inputs, which means that the demands for primary factor are derived from first-order optimality conditions as required by economic theory. Intermediate inputs are demanded in accordance with the Leontief technology, i.e., fixed proportions of intermediate composite output. Multiple commodities’ productions are accommodated using fixed yield coefficients. Specifically, the proportionate combinations of commodity outputs in the SAM produced by each activity are

assumed fixed. This implies that for any given vector of commodities demanded there is a unique vector of activity outputs that must be produced.

FINAL CONSUMPTION

There are 4 final demand components, which are household consumption, investment, government and exports. In BOT-CGE, households maximise utility derived from the consumption of composite goods that are aggregated using the Stone-Geary utility function. Consequently, the commodity demands by households are linear expenditure systems (LES). Here, the intuition is that consumers first purchase the quantities for subsistence consumption and then allocate the remaining consumption expenditure across the different types of commodities according to the marginal budget shares. Owing to disagreement on clear theories defining the behavioural responses of investment and government to changes in relative prices, the relative quantities of each commodity demanded for investment, enterprises and for government consumption are fixed at their base-year levels.

TRADE

Exports and imports are symmetrically determined via the Armington (1969) approach and small-country assumption. Used in many CGE modelling, the Armington approach presupposes that exports, imports and domestic commodities are all distinct and are, therefore, imperfect substitutes. This is interpreted as being due to quality differences. On the import side, consumers consume composite goods that are CES aggregates of their respective imported and domestically produced commodities. Similarly, producers allocate their outputs between exports and domestic commodities using constant elasticity of transformation functions. Consequently, the optimal quantities of both the export and import commodities are determined by relative prices, trade shares and trade elasticities of substitutions. The assumption of product differentiation has the virtues that it grants the domestic price system some degree of autonomy from world prices, of not generating extreme specialisation in production from economic and policy changes and allows for cross-hauling (de Melo, 1988). This feature is useful since Botswana observes in two-way trade as the SAM database shows.

MODEL CLOSURES

In an attempt ensure that BOT-CGE adequately captures the socio-economic features the Botswana economy, the following model closure conditions are imposed on the commodity and factor markets and on the macroeconomic balances. Of course, the closure rules are chosen on the basis of institutional analysis of the Botswana economy and the focus of this paper. They are also specified with care since closures define how the economic system would operate.

In the commodity markets, all commodities prices are endogenous. In addition to being easier to be implemented, this standard closure in CGE models renders demand elasticities to be reflected in the general equilibrium character of the model (Burniaux and Truong, 2002). Furthermore, the consumer price index (CPI) is the numeraire, which is needed because optimisers respond to relative price changes. For the foreign exchange markets, the world prices of exports and imports are fixed since Botswana is too small to affect world price and the nominal exchange rate is also fixed since Botswana uses the crawling-band exchange rate regime. Therefore, the foreign savings adjusts to clear the foreign exchange market. The balanced macro-closures are adopted for the enterprises, government and investment-savings accounts. Specifically, the values of total final demand for government, enterprises and investment are fixed proportions of the value of total final domestic absorption. This means that enterprises, investment and government consumption all vary proportionately to nominal final domestic absorption. Adopting balanced macro closures renders it more likely for a model to generate results that closely mimic the real-world responses and enables

the analysis to capture the possible effects of to policy shocks in a given setting (Lofgren *et al* (2002). The fixity of the investment share means that the Botswana economy is assumed to be investment-driven. This reflects that savings are not a major constraint in the economy as indicated by the excess foreign exchange but rather that the constraint to growth is limited investment opportunities.

And finally, the factor market closures are that: all the skilled types of labour are fixed in supply and inter-sectorally mobile; capital is activity-specific and fixed in supply; and unskilled labour elastically supplied at a fixed wage. These closure rules capture the stylised facts that there is a high incidence of unemployment of unskilled labour whilst capital and skilled labour are scarce. In addition, capital is fixed because the time period that is considered in this study is insufficient for the newly purchased capital goods to be installed and used. In order to obviate output and exports of diamonds from changing in response to a shock, the quantities of factors employed by the mining sector are fixed. This is essential since exports of diamonds are determined by the Diamond Trading Company.

Undoubtedly, the specifications of the factor market closures mean that BOT-CGE is cast in the short-run and comparative static mode and that the experiments are conducted in an economic scenario characterised by rigidities. This is informed by the focus of the paper and by the argument that policy analysis must be conducted within the third-best environment in African economies (Maio *et al*, 1999).

MODEL IMPLEMENTATION

In addition to the GTAP SAM database, BOT-CGE has been calibrated using the information on the elasticities of substitution for imports and exports relative to domestic commodities, the elasticities of substitution for the CES production functions, the income elasticities of demand for linear expenditure systems and the Frisch parameters for households. As common in CGE modelling, all the behavioural parameter values either are adopted from other CGE model studies and from existing literature or are guess-estimated. The substitution elasticities between labour and capital are set at 0.4 for all the industries. The adoption of low production elasticity values reflects the argument that high costs associated, for example, with hiring and firing of workers limit factor substitutions in the short run. The import and export elasticities, which are adopted from Unemo (1998), are 0.8 for commodities and 0.6 for services. Here, the argument is that services are less traded than commodities.

BOT-CGE has been implemented as a mixed complementarity problem in the General Algebraic Modelling System (GAMS) using *PATH* solver. It is run until it returns the SAM transactions that it is parameterised to as an equilibrium solution. This is the baseline run of the BOT-CGE and is the reference against which the changes induced by food-price shocks are measured. Re-running the BOT-CGE in the absence of any perturbation simply reproduces the initial equilibrium solution. Thus, prior to the food-price shocks the Botswana economy is taken to be in benchmark or long-run equilibrium in 2004/05.

SIMULATION

The primary objective in this paper is to understand the consequences of the increases in the world prices of basic food items that were observed between 2007 and September 2011. This immediately raises the question of what should be the magnitude of the food-price shock that has to be introduced to the model. This is germane in view of the evidence that world prices are only partially transmitted to domestic prices. The decision taken is to impose a shock of 46% rise in

the world of prices of both cereals and food products, i.e., the average annual increase in prices of food items for the period 2007-2011. In the experiment, the world prices of both cereals and food products are simultaneously increased by 46%. This shock is carried out under the default BOT-CGE parameter values and configurations. Therefore, the simulation results underpin what would have happened to the Botswana economy in 2007-2011 purely on account of a 46% increase in both food and cereal prices, i.e., in the absence of intervening factors. Of course, the interest is on how key economic indicators such growth, welfare, employment, *etc.*, are affected. The impact of the food-price perturbation is determined from a pair-wise comparison of the benchmark equilibrium and post-shock equilibrium solution values. Because the Botswana economy is taken to be in long-run general equilibrium prior to the world food-price perturbations and the food-price shock is the only disturbance imposed to BOT-CGE, then the differences in the solution values are certainly due to increases in prices of food items. As noted in the theoretical discussion, higher world food prices are terms-of-trade shock that expectedly have severe deleterious ramifications on the economy. By causing increases in domestic food prices, they raise production costs, particularly of industries that are consumers of cereals, and consumption expenditure, with consequential effects of reduction in the level of economy activity and employment as well as increasing both the level and severity of poverty, *etc.*

Table 1: Macroeconomic Effects of 46% Food-price Increases

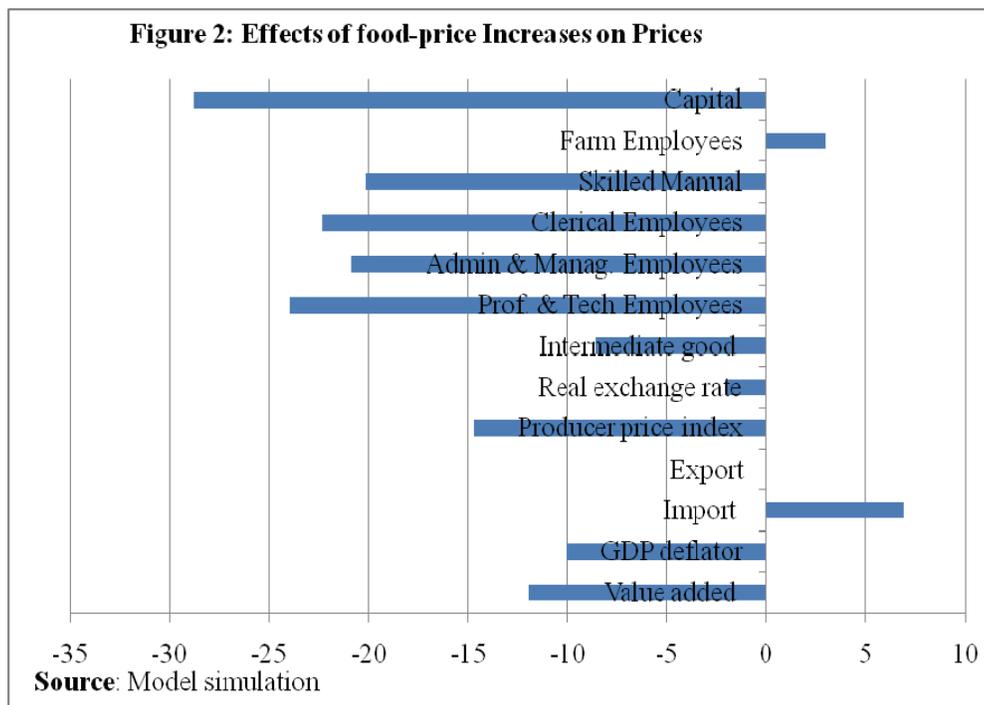
	% change from base
Value added	-0.5
Real GDP	-2.2
Final domestic absorption	-8.4
Household Consumption	-16.8
Government consumption	-1.5
Real investment	-7.5
Domestic good	-3.2
Total savings	-17.0
Household	23.7
Government	5.3
Enterprises	-8.9
Trade volume	-5.4
Total imports	-13.2
Total exports	2.2
Current Account	37.5
Household welfare	
Urban	-2.7
Rural	-3.0
Non-citizen	-0.7
Employment	-0.5
Total intermediate	-2.9

Source: Model simulation

Table 1 and figure 2 report the impact on key macroeconomic indicators. Several observations emerge from table 1. Real gross domestic product (GDP), measured from the expenditure side, de-

creases by 2.2% and employment decreases by 0.5%. The overall economic adjustment cost is evidently proportionally far smaller than the food-price increases. Examining adjustments of the price indices, which are reported in figure 2, is helpful in explaining the contraction in GDP. As noticeable in figure 2, GDP deflator falls by 10%, aggregate intermediate price by 8.61% and capital by 29%. There is also a decrease in real wages – which refer to nominal wages deflated by the CPI – of skilled labour, which ranges from a low of 20% for manual workers to a high of 24% for professional and technical employees. Conversely, real wages of farm workers increase by 3%. Of course, factor prices change in order to maintain markets for skilled labour types and capital under full-employment. These results clearly underscore that the economy experiences, on the one hand, production disincentives as evidenced by fall in GDP deflator, and, on the other, a reduction in production costs since factor prices decreased in real terms. Therefore, the economic contraction occurs because the negative effect of the production disincentives outweighs the positive effect of the reduction in production costs.

Concordant with the theoretical prediction, there is a 2% depreciation of the real exchange rates, i.e., the ratio of the producer price index (PPI) to aggregate export price and the ratio of PPI to aggregate import price and a 5% decrease in the volume of trade. The real exchange rate depreciation renders the import good more expensive relative to the domestic good. Consequently, total imports decrease by 13%. Evidently, aggregate import good is curtailed by proportionally far less than the food-price perturbation and by far more than the 3% decrease in the domestic good. This results in an increase in the import bill and on the change in consumption pattern away from the import good and towards the domestic good. This finding is consistent with that of Arndt *et al* (2008) for the Mozambique economy and theoretical prediction when the import elasticity is less than one as demonstrated by Devarajan *et al* (1994). In contrast, depreciation of the real exchange rate raises the profitability of the export good. This gives producers a fillip to reallocate resources from the domestic to the export good. Accordingly, total exports increases by 2% and the exports share in GDP increased. Clearly, the production structure shifts towards the export good.



There is also a deterioration of aggregate welfare. Final domestic absorption, which is the appropriate measure of welfare when the CPI is the numeraire, substantially falls by 17% due to the reduction in real incomes of domestic institutions. The reduction in real consumption ranges from a low of 1.5% to a high of 17% for the household sector. The fall in real investment means that aggregate welfare loss will plummet even more in the future as the productive capacity would have shrunk. Furthermore, the welfare loss is disproportionately spread across households. The equivalent variation (EV) estimates - calculated in money metric welfare functions and on the basis of the household utility changes in relation to this simulation - are -3 for rural, -2.7 for urban and -0.7 for non-citizen households. Household welfare loss is due to the decline in household incomes. The fall in real income ranges from a low of 14% for rural household to a high of 21% for non-citizen households. Whilst the change in household incomes explains the household welfare loss but it is unimportant in explaining the differential household welfare loss. A factor that explains the differential loss in household welfare is household consumption pattern. The SAM database for this paper reveals that the food share in household consumption spending in 2004/05 was 42% for rural, 30% for urban and 17% for non-citizen households. Certainly, the pattern of welfare loss is consistent with the food share in household consumption expenditure. Thus, rural households lose out more because a larger proportion of their income is spent on food items. Estimates from the poverty datum line of 2003/04 show that majority of the poor live in rural areas. To an extent that rural households are the largest losers, it can be concluded that higher food prices substantially increase both the level and severity of poverty in the country.

The thrust of the evidence presented so far shows that food-price shocks stall economic recovery, lead to welfare loss, reduce employment and depresses trade volume and investment. The economic adjustment costs engendered by world food-price disturbances may even be larger on some microeconomic sectors. Therefore, examining the sectoral level results is fruitful.

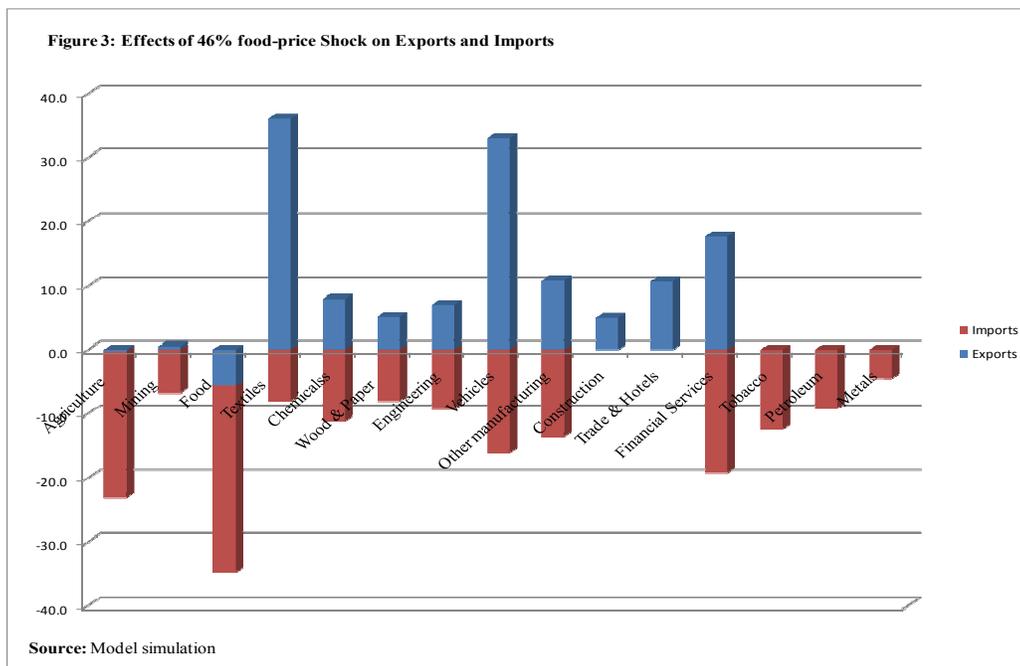
Table 2: Impact of Food-price Increases on Activities

Activity	Output	Price
Agriculture	2.07	1.30
Mining	0.28	-0.60
Food Products	-7.35	-1.57
Textiles	37.35	-4.93
Chemicals	-1.56	-10.48
Transport & equipment	22.13	-10.29
Wood & Products	-2.59	-9.14
Other Manufacturing	1.01	-9.84
Water	-4.39	-22.04
Electricity	-3.35	-18.96
Construction	-7.05	-14.24
Trade and Hotels	2.11	-13.75
Transport	-5.64	-18.05
Business Services	-2.19	-26.81
Government	-1.55	-15.49
Other Services	-9.12	-22.65
Non-profit Making Institutions	-3.58	-19.61

Source: Model Simulations

Table 2 reports the repercussions on sectoral output and prices in columns 2 and 3 respectively. These estimates show that there are 6 industries that benefit, which are mining, textiles, transport

and equipment, trade and hotels, agriculture and other manufacturing. Nonetheless, the output gains are unevenly spread across these industries. The textiles and the transport and equipment industries are the largest beneficiaries, with very large output increases of 37% and 22% respectively, whilst the least gainers include other manufacturing. It is unsurprising that the mining industry emerges as the small gainer. Mining output changes are constrained by model closure condition. In contrast, the rest of the industries witness output contractions. The output loss ranges from a low of 1.6% for both chemicals and government sectors to a high of 7% for the food sector. As revealed in column 3 of table 2, the output price of agricultural sector rises whereas those of all the other industries fall by varying degrees. The pattern of output prices evidently gives the agriculture sector an incentive to expand production and all the other industries witness varying degrees of production disincentives. Therefore, their output responses of the other beneficiaries are driven by both export-orientation and real exchange rate. The results show that the prices of virtually all domestic commodities fall, with their decreases ranging from a low of 5% for mining to a high of over 20% for vehicles, textiles, financial and other services. The only exceptions are the prices of the domestic agricultural and food commodities, which increase by 3% and 1% respectively. Since the nominal exchange rate is fixed, the adjustments of these prices point to an appreciation of the real exchange rates for the agricultural and food products and depreciations of those for all the other goods. From own calculations of share of export in sectoral output using the SAM database, it emerges that mining, textiles and transport and equipment are, in their order, exporting-industries whilst the remaining three output gainers, namely, trade and hotels, chemicals and other manufacturing, are import-competing industries. To the extent that attractiveness of producing exports and imports commodities increase, fully-employed and mobile factors are reallocated from the contracting sectors to export-intensive and import-competing industries and thereby, causing outputs of the less tradable sectors to fall. As mentioned *inter alia*, the muted response of output of the mining sector is due to the fact that this industry's demands for factors have been fixed. Clearly, these analyses demonstrate that sectoral responses are influenced by the degree of the tradability of the industry and the extent of the depreciation of the real exchange rate.



The effects on the sectoral exports and imports, which are shown in figure 3, are straightforward. The supplies of exported commodities increase, with the increases ranging from a low of 6 % for construction to a high of 36% for textiles. Conversely, exports of agricultural and food products decline by 0.2% and 6% respectively, mainly because the real exchange rates appreciate for these commodities. Without exception, the import demands decline for all import commodities. The curtailment of import demands ranges from a low of 4 % for metals to a high of 29% for food products. The depreciation of the real exchange rate explains the increases in exports and decreases in imports.

CONCLUSION

This paper investigated the impact on the Botswana economy of higher world prices of food items. The motivation for the paper is the argument that the recent higher food prices may be exacerbating food insecurity problem, stalling economic recovery and may be increasing the level and severity of poverty. The method adopted to obtain the results has been to undertake simulations using the CGE model for Botswana that has been parameterised on the 2004/05 SAM database.

The main conclusion from the simulations reported in this paper is that the current food-price shocks are stalling economic recovery, are contributing to unemployment and contributing to welfare loss. The predicted decreases in GDP, employment and welfare loss can, however, be expected to be proportionally smaller than food-price increases. The economic adjustment costs appear to be influenced mainly by the consumption pattern at the household level and the supply responses of the agricultural sub-sectors and of exports. The results clearly suggest that current efforts to increase agricultural sector's performance are in order.

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TOWARDS IMPROVED GOVERNMENT BUDGETING, COSTING AND ACCOUNTABILITY IN THE HEALTHCARE SECTOR: THE CASE OF HOSPITAL AND CLINIC SERVICES IN BOTSWANA

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Abstract: The current waves sweeping nations in the form of New Public Management (NPM) is a call for different stakeholders to review levels of systems' efficiency and effectiveness towards making public sector services relevant in the face of modern business practices. The study was carried out in the Botswana healthcare sector, and focused on costing and financial control processes at the hospital and clinic levels. The paper analyses the dire financial constraints faced by government in budget allocation, as well as the high spending liability faced by the public healthcare sector as a result of spending in AIDS/HIV programmes and other disease, the study sought to determine assess the level of financial control that exist at service provision level. The findings of the study suggest that there are opportunistic and poor control in areas of collection of service fees and medicines, which in turn affect budgetary and planning activities for these institutions. Furthermore, limited technology impacts on both financial management and administrative processes.

INTRODUCTION

Over the past three decades, governments in developing countries have embarked on measures aimed at improving government efficiency, reducing wasteful public expenditure, improving financial control, and creating an environment that lends itself to better accountability (Glynn and Perkins (2001); Hoque and Moll, 2008). This considerable drive towards radical change in public sector activities is often referred to as New Public Management (NPM). Its primary intention is to move public sector practices towards the adoption of exemplary financial, management and organization practices in order to realize improved efficiency, effectiveness and accountability in public sector delivery (Hood, 1995; Heinrich, 2002). A significant number of calls towards NPM have pointed to the need for reforming healthcare cost and financial management procedures (Lapsley, 2008; Jackson and Lapsley, 2003), with increased attention being placed on the need for reform in developing economies where service provision is already constrained by the availability of financial resources (Hope, 2002).

Like many countries across the globe, Botswana continues to experience escalating medical and healthcare costs. Being a developing country, the Government of Botswana has had to shoulder much of the resulting human and financial resource requirements of this sector. However, the on-going financial crisis has impacted on the level of monetary support that the Government of Botswana can make available for healthcare. For example, the total amount of funds set aside for the Ministry of Health in the financial year 2009 / 2010 was P 2.2 billion¹ out of a total government recurrent budget of P 27.36 billion (Government of Botswana, Budget Speech, 2009/10). In the year 2010/2011 the total government recommended recurrent budget was P 27.143 billion, out of which the Ministry of Health was again awarded P2.2 billion (Government of Botswana, Budget Speech, 2010/11).

¹ ¹ The exchange rate as at 6 September 2011 was 1 Pula (BWP) equal to 0.15 US dollar

Although imbursements to the health sector remained unchanged over the two consecutive financial budgets, the Minister of Finance noted that the sector is grappling with challenges of changing population dynamics, limited drug availability, increasing incidences of cancer, tuberculosis and the HIV /Aids epidemic (ibid, pp.24). Coupled with this is the progress in medicine and medical technology over the last two decades which are partially responsible for the increase in healthcare costs (Colpaert et al., 2010). These challenges have undoubtedly impacted on the limited financial, medical and human resource supply capacity, resulting in calls for a broad spectrum of tools and technologies that can be used to better manage resources in the healthcare sector (Government of Botswana Hansard, March 2nd, 2009, pp. 22). These include the provision of data needed for informed decisions on operations and infrastructure investment, the planning of future budgets, the establishment of charges for patient services, and the development of mechanisms for ensuring that costs do not exceed limited revenue and other resources that are embedded in public sector budgeting.

The extant literature suggests that limited resource availability should be met with some measure of financial and management reform that will provide more rigorous costing systems and accountability in order to ensure better planning and use of such resources (Christiaens and Rommel, 2008; Mellet, 2002; Pettersen, 2001). To this end, Glynn and Perkins (2001) propose that health sector reform strategies should be addressed on three levels; firstly, policies and strategies that address the planning phase during the allocation of resources; secondly, establishing a mandate or contract on the purchasing aspects that ensure that the envisaged policies are achieved; and finally, that service provision to clients is secured.

Notwithstanding the obvious financial challenges faced by the healthcare sector in Botswana and calls for '*a well-coordinated and sustainable health care delivery system that will result in optimum utilization of the scarce resources*' (Budget speech 2010, pp 24), there have been limited efforts by health practitioners and administrators in reforming cost and managerial accounting practices towards the attainment of improved monitoring and rationalizing of public healthcare services. The appearance is that a sizable amount of effort in public healthcare practice goes into securing and justifying the allocation of funds to healthcare from the national budget. Subsequently, efforts aimed at ensuring proper accountability and control in the use of such resources is limited. As a result of this reports of misappropriation of funds and corrupt practices in the use of public funds in the healthcare services have become commonplace.

Glynn and Perkins (2001) suggest that incidences of malpractices and waste are largely due to the fragmentation of accountability in the public sector where control took the form of feedback systems where planning rolls down to the professional care delivery. Hedger and Blick (2008) support this analogy and further suggest that that accounting and accountability processes in the public sector are often held as being '*self-evident*', with the assumption that Public Accounts Committees will safeguard all measures aimed at ensuring accountability and diligent reporting processes.

In addressing these concerns healthcare providers need to develop more innovative and efficient methods in the provision of healthcare services. This paper examines the current state of cost and management control practices in the public healthcare system in Botswana and outlines the potential benefits of alternative cost and managerial accounting techniques in changing the face of institutional and efficacy issues in this sector towards improving accountability across a broad-base of services in the public healthcare sector.

STRUCTURE OF THE HEALTHCARE SERVICE SECTOR IN BOTSWANA

The healthcare sector in Botswana is made up of two parallel structures; a government health care system serviced by government-sponsored hospitals and clinics, and private medical hospitals and practitioners which are primarily supported through client-subscriptions to various medical aid schemes. The first structure, the government healthcare system, consists of different types of healthcare facilities. These include three (3) large referral hospitals, six (6) regional hospitals, seventeen (17) primary hospitals, twenty-two (22) clinics and several hundred health posts and mobile stops. These facilities are aided by the services offered by six (6) missions and mining hospitals.

The government healthcare system is premised on the provision of ‘comprehensive healthcare service to the nation’ (Ministry of Health Policy). Thus the objective of the government healthcare system is the provision of free, justifiable and universally available healthcare to all citizens.

The second structure, commonly called a private healthcare system, is facilitated by medical aid bodies whose financial lifeline is the monthly subscriptions made by members. Members of these medical aid associations are usually drawn from the working populace in the urban and peri-urban areas. In comparison to the public healthcare sector which contributes about 72.7 % of healthcare expenditure (4.3 % of GDP) , the private sector contributes 27.3 % (1.5 % of GDP) as out-of-pocket expenditure (Trading Economics Report, 2008). With a lower or client bases population base compared to the public healthcare service, the private healthcare unadoptable has greater wealth and generates more income per patient than the public health sector. However, the private health sector has had its fair share of financial woes. The then largest private hospital in the country, the Gaborone Private Hospital, experienced financial dire straits in the early 1990s, but made a turnaround after an extensive systems-overhaul which included the revamping of its billing procedures, logistics, ICT and organizational structure and departmentalization into various clinics or business units. In addition to these operational reform strategies, hospital paid greater attention to the activities that generate costs, thus implementing a quasi-activity-based costing and pricing model. The Bokamosa Private Hospital which began operating in early 2010 was already experiencing financial problems by the end of 2010. In early 2011 the hospital was put under judicial management. The hospital is owned by two medical aid companies whose member’s subscriptions are subsidized in half by government.

Thus, the role of government in the healthcare sector is extensive, and even extends to the financial support of the private healthcare sector. This, and other related administrative issues, makes it pertinent to ensure that proper mechanisms of financial planning and accountability are instituted.

Table 1: Healthcare Services Indicators: comparison of Botswana, Namibia and South Africa

Economic Measurement Factor	Botswana	Namibia	South Africa	Middle income countries average
Health cost per capita: PPP (constant 2005 US international)	762	467	819	299
Health Expenditure: per capita (US dollar)	372	319	497	n/a
Health Expenditure: private (% of GDP)	1.5	4	5	3
Health Expenditure: public (% of Government expenditure)	13	11	11	n/a
Health Expenditure: total (% of GDP)	5.7	9	8	5
Health Expenditure: public (% of total health expenditure)	72.7	42	41	50

Compiled from Trading Economics database on www.tradingeconomics.com

As shown in the Table 1, comparisons with two of its neighbouring countries shows that during the year 2008, 72.7 % of healthcare expenditure in the Botswana was borne by government, whilst in Namibia and South Africa this figure was 42 % and 41 % respectively. Thus, the private health sector contributes less than the two countries in out-of-pocket expenditure (1.5 % of GDP compared to 4 % Namibia and 5 % for South Africa. In addition to this, the indication is that Botswana health cost per capita is, at 762 US Dollars, higher than many middle income countries which averaged at 299 US Dollars in 2008 (Trading Economics Report, 2008).

One likely reason for the high expenditures in Botswana's healthcare costs per capita when compared to nations in the same income precinct is that Botswana has programs that provide for Anti-retroviral drugs (ARV) and other support programs for people living with AIDS/HIV, as well as free HIV testing for all [Ministry of Health, 2008]. However, it is for this very reason of high expenditure levels that the healthcare sector ought to monitor and control expenditure in all its activities.

OBJECTIVE

The objectives of the study are:

- To map and describe the procedures used in handling patients and other processes that result in the generation of revenue or costs in public sector healthcare
- To understand the internal control procedures used in public healthcare service providers
- To analyse how budgets are generated and administered in units of healthcare service

METHODOLOGY

The study used qualitative method of enquiry for collecting data. Observation, interviews and available documents were all used in informing the study. Data collection for the study was conducted over several phases over a six-month period. In the initial phase, the study used observation and gradually introduced interviews in Gaborone, the capital city. The second phase of the study concentrated on follow-up interviews and the review of documents which were availed by respondents and other data sources. Due to the unwillingness of some healthcare practitioner to discuss aspects of accounting and internal control, the study had to rely on interviews with 37 participants, 11 of which were telephonic. These included doctors, nurses and other hospitals and clinics employees across the country. A demography of the interviewees is presented in Table 2.

Table 2: Respondents Interviewed

Occupation / Status	No. of Respondents
Doctors	8
Nurses / Midwives	9
Pharmacy staff	4
Hospital Orderlies	3
Stores and records staff (including Central Medical Stores)	3
Patients	10
TOTAL	37

The selection of the respondent relied on non-probabilistic sampling, using both judgement and snowball sampling for face-to-face interviews. These sampling techniques were effective since

the researchers initially had to rely on contacts and commendations made during interviews, and being introduced to other respondents by other interviewees. For the telephonic interviews which were conducted with people in more remote areas, who, for logistical reasons, could not be subjects in a face-to-face interview. In order to extend the triangulation of data, observation pervaded all stages of enquiry. As Moran-Elis et al., (2006) suggest, triangulation should go beyond simple ‘validation’ of the results, but should incorporate methods aimed at gaining more a more in-depth, multidimensional understanding of the phenomenon being studied so as to have epistemological claim about the study.

FINDINGS

During the data collection stage it emerged that various administrative practices advised, or had the potential to inform, the level of accounting, internal control and planning in healthcare centres a description of these features has been arranged on the basis of administrative processes that influence the various accountability processes, an arrangement that will help add clarity to the subsequent discussion. The main limitation of the study was access to all areas and persons who could inform the study. This was particularly the case in administrative functions of healthcare facilities.

Patient Handling and Payments

A patient’s consultation process begins with the payment of a service fee. For a charge of P5.00 local patients are provided with consultation, medicinal drugs, hospitalization, as well as all procedures such as radiography and physiotherapy. Non-locals, however, are required to pay P50.00 for consultation plus additional service costs as indicated in Table 3 below.

Table 3: Service Charges at Public / Government Health Facilities for Locals and Non-Locals

Service Item	Charge (locals)	Charge (Non-Locals)
Consultation	P5.00	P50.00
Admission	*	P80.00
Bed rates	P2.00 per day	P80.00 per day
X-ray	*	P20.00
Natal	*	P150.00
Scans	*	P50.00
Radiography	*	P50.00
Pharmacy / drugs etc	*	Based on prescription / itemized

* These items are covered by the P5.00 consultation fee

When assessing the entire service, it is reasonable to conclude that the focus of the government healthcare service is not cost recovery, and effectively translates to a ‘heavily subsidised’ healthcare for all. Even for non-locals, costs within the public healthcare service system are less prohibitive when compared to those charged in private healthcare. For example, consultation for both locals and non-locals at most private hospitals in the country are in the region of P300.00, bed rates are P 1 500 per night, whilst X-rays charges are around P250.00.

In terms of creating a system of accountability and record maintenance, the public healthcare system relies heavily on a single item; a manual patient card which is kept by patients at home and presented at the time of visiting health facilities. A patient’s health status, recommended medical procedures, referrals and prescribed medications are all recorded on the patient’s card.

Besides the patient card, procedures for maintaining other patient records differed across the various types of healthcare facilities. In most of the clinics and smaller hospitals covered by the

study, the finding was that no other record of a patient's visit, their treatment and the medicinal drugs prescribed is made by the consulting nurse. One nurse explained that they had once been trained on the use of a clinical information system that could serve as a data base for most dispensary and patient care records, but that this had not been implemented. As one respondent explained, failure to implement this system has led to the status-quo being maintained.

In the referral hospitals (Gaborone, Maun and Francistown, Lobatse were mentioned) the study was informed that consulting physician use a chart to note the medication prescribed to patients and also writes a brief description of the patients medical condition. The dual manual system that is maintained (patient card record and doctors chart) is clearly non-integrated and rarely lends itself to proper verification process or similar internal control procedures. This was put in perspective by a hospital orderly who described how: *You can go to a hospital today and get medicine for any ailment, then a nearby clinic or another hospital for the same ailment and receive similar medication. All you have to do is say that you have lost your last card and pay the P5.00 that they ask for.*

However, a critical data base system that is maintained in the referral hospitals is in the pharmacy department. Once a patient has completed their consultation and other procedures they will usually be prescribed some medication. Using an Integrated Management System (IMS), the pharmacy department then makes electronic records of prescribed drugs. Every patient who visits the hospital is registered on the system using the national identity card for locals or a passport for non-locals, and a permanent record of all medicines dispensed for the patient will be maintained by the system. However, a pharmacist in Gaborone went on to explain that: *When a patient has completed the medical consultation process they will often be given a prescription. The system that we use here captures patients in our hospital only and will not be accessed by other hospitals or other health facilities. If a patient leaves our hospital and goes to another hospital anywhere in the country they will be entered on a different system and given a new account. The systems are not connected at all. The only record of previous consultations that the other hospital can get on the patient is what is recorded on the patient's medical card.*

The use of an IMS has clearly been an improvement on earlier procedures that are still in use at clinics and other health facilities. The system is able to capture physical quantities of medicine ordered by wards in the hospital, as well as medicine dispensed to out-patients. In addition, the system is able to generate critical data such as monthly consumption of any drug, number of patients per day, average number of items per patient and periodic ending inventories of the various drugs. However, the failure to merge the data bases of the various hospitals for data interchange remains a limitation of the system's full utilization.

Internal Control Procedures in Drug Dispensary

Besides the procedures laid out for patient handling and payment, the study determined that another important element in internal control and creating integrity in patient consultation and the provision of drugs is the adherence to procedures that legitimize the processes. For example, given that there are different service charges for locals and non-local patients, and that the government charges minimal rates for services rendered, the observation of consultation and payment procedures would help government collect some revenue from healthcare services.

From the inception of the study it became clear that in some instances healthcare practitioners in government clinics and hospitals were aiding non-locals to access health services without making the recommended payment, or were themselves taking advantage of poor internal control procedures to obtaining medicines and other hospital supplies. *A friend, a foreigner, at work was very ill. W offered to help her with medication but she just said that she already gets*

her supply of antibiotics and other medicines from a friend (a local) who works as a nurse in a clinic at a nearby village.

The appearance was that these practices were not confined to certain villages or clinics. During another interview a patient in the capital city reported how his consultation session with a doctor was interrupted by a man, a non-local, who had come to 'visit'. The respondent went on to submit the following: *The man, a (foreign nationality) was let in by one of the hospital attendants while the doctor was attending to my son. He told the doctor that the medicine has run out and that his wife and son now had the flu. The doctor scribbled something on a piece of paper and told the man to give it to the pharmacist. By the time we got to the pharmacy the man was waiting on the other side on a bench and had not queued up like the other patients. He was later called by the pharmacist who gave him a bunch of pills and some bottles of medicine.*

These submissions appear to be confirmed by statements made by the Minister of Health and reported in local and international media. When giving a report on the theft of life-saving medicines, the Minister stated that: *We have reason to believe that the theft of these drugs is not spearheaded by the locals who acquire them for free but rather by foreigners though it is also possible that locals are somewhat involved.... These people are looking to make money out of the drugs that the state gives to the public free of charge.*

As one nurse concluded: **Respondent:** *This practice has been there for many years. Go to any nurse or hospital orderly's house and you'll find many pills that they took without having to document on a card. When a child is ill you just tell them that you'll bring them medicine latter.*

Interviewer: *But tell me, won't there be a shortage of medicines when supervisors come to check?*

Respondent: *I don't know what you mean by supervisors. When a person comes to the clinic you consult and then note on the card the medicine that you have given them. The patient takes the card with them. Some will then write on a sheet how much medicine is left. So some people can still give medicine to another person without using the card, even if you will write it on the sheet.*

With reference to aiding foreigners obtain medicines from local facilities without making the required payment a mid-wife at a hospital explained that she was aware of this practice, but that it was the result of a nexus of socio-economic factors. According to her the key factor was the fact that there was too much disparity in the cost of healthcare service in the private versus the public healthcare sector, and that ultimately non-locals looked for ways to access the services at low costs. In her view: *There is no monitoring of medicines and other supplies at clinics so it's like people want to scramble to get the services. If you are a non-local you have to pay some amount, but if you know someone in the system you can just get the medicines since supervision and monitoring is so poor. How does giving the medicine out without recording it anywhere make a difference because in the end you will ask for medical supplies without showing how it was used or giving a record of its use? In the end it's about how much medicine you order.*

The clarification given by the last respondent points to the suggestion that the focus of the medicine supply/use system is on the ordering of medicine from stores, with little to no internal control process that justifies or legitimize the issuing of such supplies.

One other disconcerting area of financial control that was revealed to the study by patients was they often felt that the fees and charges pronounced were not followed by healthcare officers, and that there were often little efforts made to make the payments binding on patients. For example, a respondent in Francistown informed the study that: *My mother has been admitted to the hospital several times. There was even a time when she was admitted for a continuous period of*

three month. I hear that we are supposed to pay P2.00 per day for her hospitalization and I know that I probably should. However, we have not paid and the hospital just keeps admitting her without saying anything.

Budget Control and Administration

Although the services offered in hospitals and clinics are all done under the supervision of a hospital superintendent or a senior healthcare practitioner in the case of clinics, the budgeting for services and their subsequent provision is somewhat centralised. The study was able to gain access to two units which provide centralized services to health centres, these being the Central Medical Stores and the National Health Laboratory. The extent of planning, budgeting and control of these two units are discussed below.

Central Medical Stores Procedures

The Central Medical Stores (CMS) facility is located in the capital city, Gaborone, and is responsible for procuring, receiving, storing and dispatching medicines (drugs), consumables, laboratory reagents and equipment. It caters for the requirements of all referral hospitals, primary hospital laboratories, National Health Laboratories, National Blood Transfusion Services and other ancillary health services.

The primary data used in the planning phases of the CMS is based on estimated consumption levels of the various healthcare facilities. On a monthly basis each healthcare facility is required to submit information to the regional management team which shows the amount of drugs and other supplies used over the month, or to show the monthly trend in the use of drugs and supplies. This information is then compiled by CMS which then estimates consumption levels of the various products, as well as preparing a budget for forthcoming periods.

Respondents at the CMS pointed out that the task of estimating medical and other supplies for the entire nation was a daunting one. Confidence in data received and the records kept by healthcare outlets appeared to be the primary issue in trusting the appropriateness of data from many healthcare centres. As one of the respondents posited, some of the major limitations faced by the CMS are that: *The one piece of information that we need for planning and dispatching of supplies to the end users is the average monthly consumption. At the moment we (CMS) are unable to get reliable average monthly consumption data for each facility because these figures vary drastically from month to month, and can show considerable increase in one month without us knowing the justification for such increases. This happens a lot with clinics where nurses have to double as healthcare providers and also have to collate critical data like the monthly consumption figures. Ultimately they only think about our request when the figures are needed.*

Another respondent also cast a doubt on the validity of the data that is given to them and the resulting effect of this on stock management issues. He explained that: *The whole process of data gathering and record-keeping in these health centres is unsupervised. In the end we end up basing our stock levels on incorrect data. This makes inventory management very unreliable. Then when there are shortages of supplies in the health centre they tell the Ministry, not us.*

Thus, operations at the CMS appear to be severely hampered the reliability of data that they receive. This made budgeting and stores management a continuous problem for the centre, and even affected other areas of their operation. As one of the respondents outlined: *At the moment public confidence in the operations of the CMS is at all time low. There are media reports on us (CMS) disposing of out-dated drugs while there are shortages of many critical drugs having run out in hospitals.Remember that we also distribute Anti-Retroviral drugs (ARV) through the country..... Recently it was estimated that we disposed of medicines worth several thousands in*

the period of one year. We have incurred high variances in the past; I wonder how we compare to other government departments.

The same respondent went on to point out that part of the problem faced by the CMS is the centralization of this activity for the entire country, but that this was currently being reviewed with a facility being proposed in a Central district of the country. His was also of the opinion that cost savings could be made by the department if more rigorous data collection process were in place in medical facilities. As he explained: *This is not only about availing correct data on average monthly consumption since this will always involve some amount of estimation. It is more about collecting on the number of patients, their ailment, fluctuations in drug use etc. This would allow us to take raw data such as average monthly data from centres and then use it to make projects for budgeting purposes.*

The respondents were however unable to fully describe the systems used in budgeting and procurement at the time of the study a consultation team was in the process of evaluating and reforming parts of the operations on the CMS.

National Health Laboratories

The National Health Laboratories (NHL) is responsible for administrative and service delivery requirements that relate to the provision of laboratory testing services. The NHL is also tasked with the management of referral laboratories for specialize chemistry and microbiology testing services. At the referral or hospital level, medical -officers –in charge and respective supervisors are responsible for managing facilities.

At hospital levels, doctors and other medical practitioners were responsible for the daily activities as required by medical and clinical requirements. This included core activities of testing, consulting and recommending treatment based on clinical samples. When asked about budgetary planning and monitoring, one respondent was quick to point out that carried out their clinical activities often without any knowledge and consultation on how much had been budgeted and how the budget was progressing. His experience was that:

Respondent: *We are required to carry out our services as clinical consultants. I have been doing this for over 12 years and have not been asked to discuss how much money we may need in our hospital for laboratory functions. The budgets for all laboratories are done centrally and every unit then gets its share. I know that we never run short of money for lab work, nor are we told that we spent more than what we have been allocated. I remember though that in the past year we have been told that we had a lot of money left, and that this was then taken to be used elsewhere.*

Interviewer: *Don't you have a system of monitoring how many tests and patients you consult?*

Respondent: *We prepare lab results and compile these, but we just pass them on to the record section here at the hospital..... they are not for budgeting. Our allocation of funds comes from the centre (NHL head-office).*

However the respondent went on to inform the study that even though they, as medical-health practitioners, do not participate in budget planning or monitoring for their units , their supervisors may be involved in planning at the referral unit level, as well as probably for at the mother body(the National Health Laboratories). The respondent went on to mention that spending and budgets were not regularly discussed in their sectional meetings and that his impression was that budgets appeared to be the responsibility of the ministry (of health) probably in consultation with hospital management and the NHL head-office.

CONCLUSION

The current study determined that the Government of Botswana offers a heavily subsidized healthcare service for both locals and non-locals. But poor recording procedures at the level of patient care, inadequate accounting, supervision and internal control procedures have led to situations of where the system is abused. This has not only resulted in the loss of potential revenue and increased costs to government through opportunistic behavior by both healthcare service providers and patients, but also often results in the provision of flawed and incorrect data for budgeting and other planning activities. Apparently costs in this sector costs are driven by centers and controls therein. Pharmacies, for example, do not observe strict regulations and control on issuing of medicines. There no one way of checking if the medicine that has been dispersed on the card is the same as that given out and there is not even a way of verifying stock. That is to say the number medications prescribed by a doctor or nurse cannot be verified to see if it is equal to the one that has been taken out of the dispensary table

The lack of computerization and adequate information systems also inhibited the availability of essential information required for decision-making in the sector. For example, patient visitation records are maintained on a manual source that is kept by patients, monthly consumption levels are not well maintained and verifiable, and budgeting is problematic because of the many administrative and procedural features that pervade public healthcare practices. It was also apparent that the institution of proper accounting and internal control procedures has, at this juncture, not been a priority in healthcare-service provision. A case-in-point is the implementation of what is effectively a 'selective and non-integrated' IMS used for dispensing drugs in hospitals.

In terms of costing, the appearance was that there were no concerted efforts made to compare or to make a correlation between the cost of outputs and the resulting revenue or services offered (for example, number of patients and medicinal drugs disbursed). This created little incentive for healthcare practitioners to control costs and expenses as the availing of medicines and other supplies was not based on verified data. Thus, it is the system itself which does not lend itself to a culture of cost-effectiveness. In addition, the appearance is that nurses, doctors and other healthcare practitioners are not involved in budget planning and controlling, at that subsequently there is no 'ownership' of budgets and cost management activities at the lower echelons of hospital and other healthcare facilities management. In fact, based on the respondents' submissions there appeared to be little evidence of notable calls towards cost management and reduction in the healthcare sector.

Based on these finding, the following recommendations are made by the study. Firstly, there is dire need to improve documentation and internal control of medicinal drugs and supplies throughout the supply-chain and dispensary processes. Since the entire public healthcare service generates minimal income and has the characteristics of a cost centre, financial improvement will be maximized through more stringent cost control. This will require inter-alia:

- The introduction culture of a cost-management where standard costs and quantities are set for different materials and medicines.
- The institution of improved monitoring and stock control techniques to minimize or eliminate waste through carrying out-dated items of stock.
- More binding and standardized operational processes for patient handling and processing across different medical facilities. The nonchalant approach adopted by some health practitioners clearly misinformed critical data such as average monthly consumption, which in turn led to incorrect data being relayed to the medical supply system.

To support the first recommendation, as well as improving general administration and patient care, the government should implement a fully integrated electronic management system. This

will allow the system to have complete patient records that can be accessed by medical practitioners across the country. It will facilitate the provision of more correct information on the consumption of medicinal drugs and supplies in all facilities across the country, information that is critical for planning and budgeting purposes at all tiers in the public healthcare service.

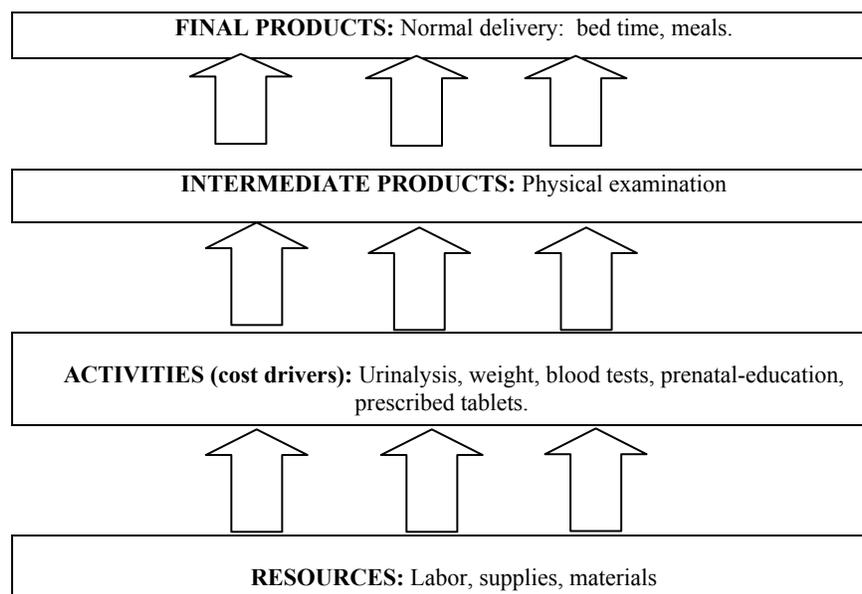
A major part of this second recommendation requires the use of electronic patient records rather than manual cards which are currently the kept by patients. The consulting physicians and nurses should be able to make electronic record of all the prescriptions made to patients and in hospital wards so that this raw data can be compared to pharmacy records for better control and accountability.

Thirdly, there needs to be more accounting and stores personnel within areas of healthcare service provision in order to improve information accumulation across different health facilities. Since accounting and cost management are important in improving organizations under NPM, health practitioners need to be trained in healthcare cost management so that they can be effective participants in management strategies.

Fourthly, there should be more frequent assessment and conducting of National Health Accounts by the Ministry of Health. Although the intention of the government has never been cost recovery through charging of patients, the government still needs to know or be informed on the level of costs so as to prepare more informed budgets, to have better cost control systems and to be able to determine major variance more timely so that they can investigate the cause.

Finally, the use of Activity-based costing system has been an effective tool for planning and budgeting in both private and public healthcare settings. The use of activity based costing systems could therefore be implemented as part of the wider cost management strategy. The advantage of activity based costing and management systems is that it allows better understanding and control of activities, at the same time giving insight on how resources are demanded by activities in the delivery of a service. An example of maternity care can be given as an illustration of this. When an individual has normal delivery this will comprise of activities such as prenatal visits, labor, delivery, post delivery bed care etc. Each of these comprise of several other activities that can be attached to some cost such as urinalysis, blood count test, HIV test, iron supplement tablets and so on. Costing these components or activities and resources will result in a better estimate of normal delivery costs.

Figure 1: Possible use of Activity Based Costing in Healthcare: an Illustration Normal Delivery Costs



The recommendations made in this paper require a change in orientation and a culture of cost management. They also necessitate substantial financial cost in their implementation. However, the rising cost of public healthcare provides the motivation for finding more cost effective utilization of the nation's resource. Thus, the implementation of proper costing, budgeting and monitoring systems will result in cost savings that can be used in systems improvement, widespread use of IMS and similar technologies.

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IMPACT OF DEPOSITORY RECEIPTS NORMS ON INDIAN IT COMPANIES: A CASE STUDY

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Abstract: This paper examines the liberalization of rules and regulations of Depository Receipts in India since 1999-2009 as well as examines the share price effect of international listing of stocks by taking three IT companies in India. The empirical analysis is done by using event study methodology, dummy variable regression and t-test. The sample comprises of IT companies, which went for foreign listing on NYSE stock exchange over the period 2000 to 2009. The test window is +/-20 days around the date of listing abroad. We find that in respect of IT company's international listing does not result into any substantial short term positive effect on stock returns. The average abnormal returns (AARs) of Pharmaceutical companies have been found to be positive but statistically insignificant even at first day of post – listing. It is not significant on the listing date. These results are confirmed by dummy variable regression and t test, which shows that IT stock returns, are not statistically significantly different in pre-listing and post-listing period. Thus contrary to the results of the previous studies (Alexander et al: 1988, Foerster and Karolyi:1993) which have shown substantially lower post listing returns for the internationally listed stocks, we find no substantial difference in pre and post listing returns of our sample stocks in the domestic market. This might be due to the increased integration of stock markets worldwide.

INTRODUCTION

Internationalization of financial markets has gained greater attention during the last two decades. In line with the global trend, reform of the Indian stock market also started with the establishment of Securities and Exchange Board of India (SEBI), although it became more effective after the financial sector reforms initiated in 1991. Indian Stock Market has also joined the integration process. Indian Companies have also been allowed to tap the global market through international listing (also known as cross listing or dual listing or foreign listing).

International cross listing is a listing of equity shares in one or more foreign exchange. It can be done by two ways through direct listing and depository receipts. Depository Receipts (DR) can be of two different types i.e. American Depository Receipts (ADRs) and Global Depository Receipts (GDRs).

International listing has been rationalized due to segmentation – integration of capital markets. Segmentation of markets helps in reducing barriers like information constraints. Theory suggest that stock prices for firms that cross list from segmented markets are expected to rise and their subsequent markets expected returns should fall as an additional built in risk premium compensating for these barrier dissipates.

According to Bank of New York Mellon, 2009 year end market review, investors were able to select from a record 3,127 sponsored and unsponsored Depository Receipts programs for companies from 77 countries. Depository Receipts capital-raising transactions during 2009 were dominated by issuers from China, India and Taiwan. Of the 63 Depository Receipts capital-raising transactions, 40, totaling \$8.7 billion, were from companies in these three countries. Overall Depository Receipts performance, as tracked by The BNY Mellon ADR Index, rose strongly during 2009. On December 31, 2009, the index closed at 181.46, up 36% for the year. All but one of the 35 BNY Mellon ADR country indices posted higher returns in 2009, with the Argentina, Brazil and India indices among the ADR country indices posting returns greater than 100%. It is also important to mention here that up till March 2009, 13 Indian stocks are listed at New York Stock Exchange, 3 listed at NASDAQ, 72 listed at Luxemburg and 24 listed at London Stock Exchange.

RESEARCH OBJECTIVES & HYPOTHESES

The impact of international listing is a rich area of research. The present study fills the gap by taking a sample from the Indian companies. The results of the study can be used by policy makers, companies and investors at large. Our objectives are:

- 1) To study the rules and regulations changing in the Depository Receipts since 1991.
- 2) To examine the impact of international listing of stocks by Indian IT companies on stock return in the domestic market.

International listing leads to statistically significant positive abnormal returns in the domestic stock market around the date of listing is the hypothesis.

DATA AND SOURCES

The study uses the secondary data. The sample of the study comprises of three Indian Information Technology companies which went for international listing on New York Stock Exchange (NYSE) over the period 2000 – 2009. The sample company comprises – Patni Computres System Ltd., Satyam Computers Ltd. and Wipro Ltd.

The secondary data comprises of daily closing adjusted share. Bse 100 index used as the proxy for market portfolio. The data is obtained from PROWESS, a database maintained by centre for mentoring Indian economy (CMIE) widely used by researchers in India. The listing dates are obtained from PROWESS, Economic Times electronic database as well as Bank of New York websites.

RESEARCH METHODOLOGY

Internationally accepted methodology for analyzing the impact of international listing of stocks on stock returns as developed by Foerster and Karolyi (1998) shall be used. In general we utilize an event study methodology in which event date (listing date in our case) is denoted as 0 and stock returns for some days (say 20 days) before and after that event date are analyzed to detect whether there is any listing effect of foreign listings or not.

We collect information regarding the exact day of listing of ADR/GDR of the sample companies. From the financial database we obtain the daily closing prices of each stock in our sample – 128 closing prices before the event date, 20 closing prices after the event date, and the listing day closing price, totaling 149 closing prices for each stock. We compute daily return for each stock and for the market index. The returns are computed as $[(P_t/P_{t-1}) - 1]$.

We used the first 108 days as the estimation period for using single factor model. We used the Bse 100 index returns as the single factor. We used the coefficients estimated for each stock to compute daily expected returns and then subtract them from the actual daily returns to obtain daily abnormal returns ($AR_{i,t}$) from 20 days before to 20 days after the listing date. We computed the cumulative abnormal returns ($CAR_{i,t}$) for each stock in the period from 20 days before to 20 days after the listing date. Finally, for each day in the event period we compute the average of the $AR_{i,t}$ and $CAR_{i,t}$ to obtain the returns of an equally weighed portfolio of our sample. To test the robustness of the variables, we run the regression and use the dummy variables also. The study conducted the t-test to check the statistical significance of that empirical result.

REVIEW OF LITERATURE

According to Merton's (1987) model, all else equal, an increase in the size of a firm's investor base, which Merton calls the 'investor recognition' factor, lowers investors' expected

return. Firms can reduce their required rate of return by taking actions to make investors aware of them. Alexander et al (1987), study proved that expected return on the dually listed securities was different from the expected return when it was not dually listed due to the introduction of foreign market risk and alteration in domestic co-variance risk. Further, In 1988 he studied the same impact by taking 13 Canadian firms and 21 non-Canadian firms listed in the US stock exchanges and found that CARs of non-Canadian firms reduced significantly by annualized 37% while CARs for Canadian sample reduced significantly by 14%.

Skinner (1989) examines the variance of returns on common listed stocks around the time exchange-traded options and found the same result. Jayarman, et al (1993), study the impacts of ADRs by companies from Japan, the UK, Australia France, Germany, Italy, and Sweden to the risks and returns of underlying shares. The result shows that underlying shares report excess positive returns on the listing dates of ADRs, suggesting there is value associated with ADR listing. Foerster et al (1993) also arrived at similar conclusions with their sample of Canadian firms. Additionally, they found that returns patterns varied across industries: natural resource-based stocks did not see significant changes in returns, whereas non-resource-based stocks gain over 20% pre-listing excess returns but endure post-listing declines of over 13%. Therefore, they concluded that natural resource-based industries are more integrated compared to the other industries. Further (1999), they recorded that capital-raising firms experienced positive abnormal returns in the post-listing period whereas non-capital-raising firms experienced negative abnormal returns.

Domowitz et al (1998) used a sample of Mexican ADRs from 1984 to 1993 to illustrate the nature of changes in volatility varies from one security to another, as predicted in the partial fragmentation situation. Overall empirical evidence to date remains inconclusive about the impact of foreign listings on the underlying domestic shares. Martell et al (1999), found that few positive returns exist and there were no significant systematic changes in returns variance. Sanvicente (2001) reaffirmed the findings of Costa et al (1997) in context of the Brazilian market. His sample constituted 26 Brazilian firms traded on the US markets over a period of 1997-2000. He observed that (a) CAR appreciated by 7.83% in the 100 days before the trading; and (b) CAR further appreciated by 15% in the 100 days following the trading. These results were in stark contrast with the results from the studies done with the samples of firms from the developed economies, which often record negative or insignificant impact on prices after the foreign listings of firms' securities. Author attributed the positive impact due to the improved access of foreign listed firms to a larger capital pool. Baker et al (2002), examines the impact of international cross-listing on the visibility (investor recognition shareholder's base) and cost of capital. They found that return pattern for both NYSE & LSE listing firms were consistent with a reduction in the cost of capital following listing. Overall this paper supports the investor recognition hypothesis

Kumar (2003), examine the impact of Indian overseas on the Returns of the domestic underlying shares. The sample of firms studied is derived from seventy-two Indian firms which listed 85 DR programs on the foreign markets from 1992 to 2001. He proved that DR listing record significant positive abnormal return on the listing day and negative abnormal return during the post listing period. Majumdar (2007), study the inter-sectoral and inter-temporal characteristics in prices of stocks of Indian origin that are being dually traded on the American and the Indian stock exchanges. The trend up to 2006 shows that the existence of high premia levels of the American Depository Receipts (ADRs) over the underlying domestic securities but do not found any increase in domestic stock prices across firms after their foreign listings. Carpentier, et al

(2007) study summarizes that he does not observe any reduction of the cost of equity following cross-listing of Canadian firms. Yu-shan Wang et al (2008) concluded that there were no significant abnormal returns for Asian Companies before cross listing but there were significantly negative abnormal returns after cross listing.

INTERNATIONAL CROSS LISTING BY INDIAN COMPANIES: TRENDS AND ANALYSIS

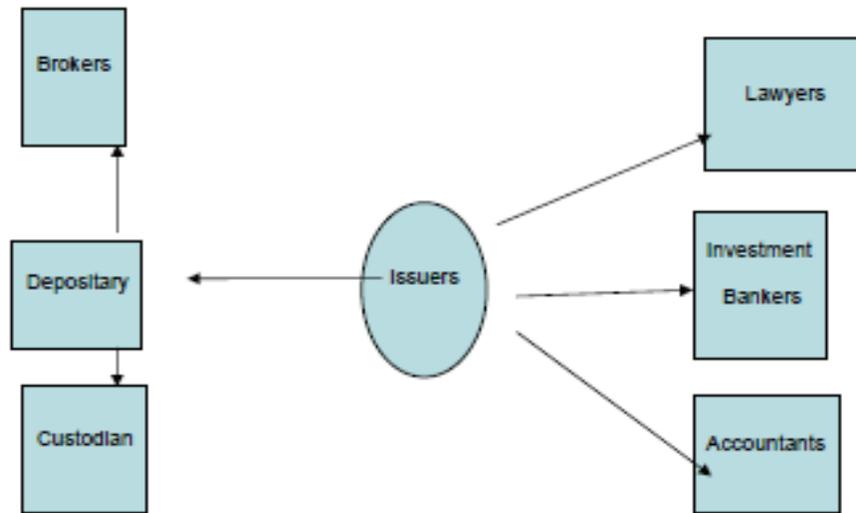
International cross listing is a listing of equity shares in one or more foreign exchange. It can be done by two ways through direct listing and depository receipts. Direct listing means meeting all the requirements and generally accepted accounting principles of that exchange. Depository receipts (DR) mean a negotiable instrument issued by depository bank to the international investors against the issuer's local currency shares.

According to the Bank of New York mid year report publication (2009), there are over 3050 Depository Receipt programs for companies from over 75 countries. The establishment of a Depository Receipt program offers numerous advantages to non-U.S companies. Generally we say that Depository receipts usually expand the market by broadening the shareholder's base and diversify the investor's risk by providing greater liquidity which may increase or stabilize the prices of the shares. It enhances the company's visibility and image of the company's product, services and financial instruments in a marketplace outside its home country. It is a flexible mechanism for raising the capital. It is beneficial not only to companies but also to investors. Their main aim is to diversify the portfolio risk. Through depository receipts obstacles such as undependable settlements, costly currency conversions, unreliable custody services, poor information flow, unfamiliar market practices, confusing tax conventions and internal investment policy is abolished. It provides familiar trade, clearance and settlement procedures, competitive U.S. dollar/foreign exchange rate conversions for dividends and other cash distributions, ability to acquire the underlying securities directly upon cancellation etc.

One Depository Receipts certificate may represent 1 or more shares of the foreign stock, or if the stock is expensive, then the Depository Receipts may represent a fraction of a share, so as to give the Depository Receipts an initial moderate price, or be in the range of similar securities on the exchange where the Depository Receipts will be listed. The ratio of company stock to its Depository Receipts can range from 100,000:1 to 1:100. Because many Depository Receipts don't have a one-to-one ratio between the depository receipts and the shares of stock, financial ratios are often not included in stock listings.

In order to establish a Depository Receipt program, issuer selects a depository, a custodian bank and an advisory team constituted of lawyers, accountants, and investment bankers. While the advisory team plays a crucial role during the initial floatation and listing process of the Depository receipt program, the role of the depository and the custodian bank is crucial even after the initial floatation and listing process gets over. They are responsible for managing the issue on an on-going basis. The issuer appoints custodian bank in consultation with the depository bank. The issuer and the depository bank enter into a depository agreement that sets forth the terms of the Depository receipt program. The agreement stipulates the rights and responsibilities of the issuer, depository and the investors investing in the Depository receipt program. The issuer, on an on-going basis, deals only with the depository bank in regards to payments, notices or rights/bonus issues related to the Depository receipt issues. The depository agreement, as a general rule, sets forth an obligation of the depository to provide notice of shareholder meetings and other information about the issuer company to the investors so as to enable them to exercise their

shareholders rights. While for GDR investors voting rights rests with the depository bank, ADR investor are allowed to exercise their voting rights in individual capacity. Depository bank is also responsible for secondary market transfers / cancellations of Depository receipts. The depository agreement also set out the amount payable as administration fee from the issuer for the services offered by the depository.



Source: Citibank's information guide to ADR'S (2007)

1) **Broker-** responsible for making securities available to investors, submitting the required forms to become a market maker in a DR program as well as executing and selling trades.

2) **Depository** is the bank authorized by the issuer company to issue DRs against the equity shares of the issuer company deposited with domestic custodian. It is the overseas agent of the issuer company who issues the DRs to the investors in lieu of shares allotted to him/her. The physical possession of the shares rests with the domestic custodian although the ownership of the shares vests with the DR investors. Banks such as the Bank of New York, Citibank and J.P. Morgan have been acting as the depositaries in many DR programs. The legal relationship between the DR investor and the depository bank is that of trust. The depository is the registered owner of the shares and its name appears in the 'Register of Members' of the issuer company. The most important role of a depository bank is that of stock transfer agent and registrar. Therefore all major depository banks maintain the sophisticated stock transfer systems. Depository bank is responsible for (i) advising the structure of DR program; (ii) appointing the custodian; (iii) assisting in complying to the regulatory requirements for floating DR program; (iv) coordinating with lawyers, accountants and investment bankers to ensure that all program implementation steps are completed; (v) preparing and issuing the DR certificates; (vi) enlisting the market makers (vii) faxing the announcement of program establishment to brokers and traders; and (viii) acting as the liaison between the issuer, the securities markets participants, and the DR holders once a depository receipt facility is established.

3) **Custodian-** is the banking company situated in the issuer's home country appointed as a custodian of the underlying shares of the issuer company. It is responsible for holding the under-

lying shares, communicating with depository on corporate actions and related issues and transmitting dividend payments to the investors through depository.

4) **Issuer Company**- is the one who the underlying company securities for the Depository Receipts program. He performs several functions like preparing the issue proposal, determining the financial objectives, obtaining the required approvals from Board of Directors, shareholders and regulators as may be needed, deciding the type of DR program to be issued, providing financial information to accountants, developing investor relations plan.

5) **Investment Banker (lead manager)**- is the person responsible for underwriting process, establish syndicate of participating Banks, advise on capital structure, advise on ADR facility structure ,conduct due diligence, draft prospectus, obtain DTC, Euro clear and Clear stream eligibility, as needed, organize book-building and line up market makers, price and launch ADR offering etc.

6) **Lawyers**- are responsible for advise on ADR facility (legal) structure, negotiate Deposit Agreement, prepare appropriate registration Statements or establish exemptions with SEC, as applicable, prepare listing agreements for U.S .exchanges (Level II and Level III ADR facilities),assist in the drafting of offering circular/prospectus etc.

7) **Accountants**- are responsible for preparing financial statements in accordance with (or reconciled to) U.S.Generally Accepted Accounting Principles (U.S. GAAP) or International Financial Reporting Standards (IFRS) for Securities Act-registered securities (Level II and Level III DR facilities).

DR program can be classified on the basis of the countries in which their DR programs are issued and listed. One of the most common types of DRs is the American depository receipt (ADR), which has been offering companies, investors and traders global investment opportunities since the 1920s. American Depository Receipts are certificates which represent the stocks of a foreign company, but are listed on American stock exchanges or over-the-counter, and all transactions are in U.S. dollars, and all communications are in English. Other types of DRs are global depository receipts (GDRs) (the other most common type of DR), European DRs and international DRs. GDRs are commonly listed on European stock exchanges such as the London Stock Exchange. . Both ADRs and GDRs are usually denominated in U.S. dollars, but can also be denominated in euros.

ADR program can also be classified on the basis of the rules and regulations of the issuance process, purpose and the post issuance reporting requirements of the program. Depository Receipt facilities may be:-

1) Un-sponsored Depository Receipts are issued by one or more depositories in response to market demand, but without a formal agreement with the company. When investors show their buying interest in the shares of a particular foreign company, broker(s) purchase those shares listed on the company's home market and request the delivery of the shares to the depository bank's custodian operating in that country. The broker then converts the US dollars or Euro received from the investor into the corresponding foreign currency in order to make payment for the purchased shares from the company's home market. On the same day custodian notifies the depository bank that the delivery of the shares has been received. Upon such notification, DRs are issued and delivered to the initiating broker(s), who then delivers the DRs to the investor. If the DR facility is established without the active participation of the issuer company, then the fee payable to the depository bank is borne by the holders of un-sponsored DRs.

2) Sponsored Depository Receipts may be issued in different levels; available in various trading markets, and is issued by one depository appointed by the company under a Deposit Agree-

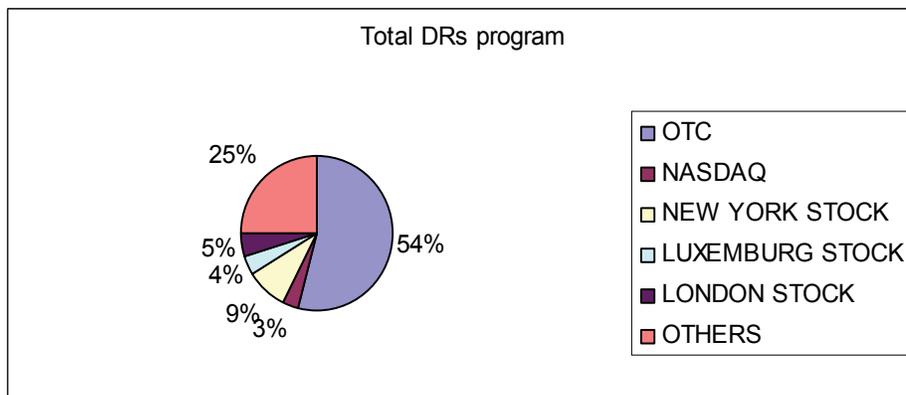
ment or service contract. Sponsored Depository Receipts offer control over the facility, the flexibility to list on a U.S. or European stock exchange and the ability to raise capital. Sponsored DRs to be issued in the US markets must be registered with SEC using the Form F-6. The filing in the Form-6 is made pursuant to provisions of the Securities Act 1933. Security Exchange Commission (SEC) of US recognizes following types of the Sponsored ADRs:

(I.) Level-I American Depository Receipts; and (II.) Level-II and Level-III American Depository Receipts.

Level I program does not require full SEC registration and the company do not have to report its accounts under U.S. Generally Accepted Accounting Principles (GAAP) or provide full Securities and Exchange Commission (SEC) disclosure. Essentially, a Sponsored Level I Depository Receipt program allows companies to enjoy the benefits of a publicly traded security without changing its current reporting process. These are traded in the U.S. over-the-counter (OTC) market with prices published in the Pink Sheets and on some exchanges outside the United States. It is the fastest-growing segment of the Depository Receipt business. The majority of sponsored programs are Level I facilities.

Level-II and Level-III program Companies that wish to list their Depository Receipts on a U.S. stock exchange (NASDAQ, American or New York), raise capital or make an acquisition using securities use Sponsored Level II or Sponsored Level III Depository Receipts. The issuers of level-II ADR programs are required to partially reconcile their financial statements to US GAAP. However, there is no need for individual business segments of the issuer to reconcile their financial statements to the US GAAP. Level III programs typically generate the most U.S. investor interest because capital is being raised. Only Level 2 and Level 3 sponsored ADRs can be listed on the New York Stock Exchange, the American Stock Exchange, or NASDAQ.

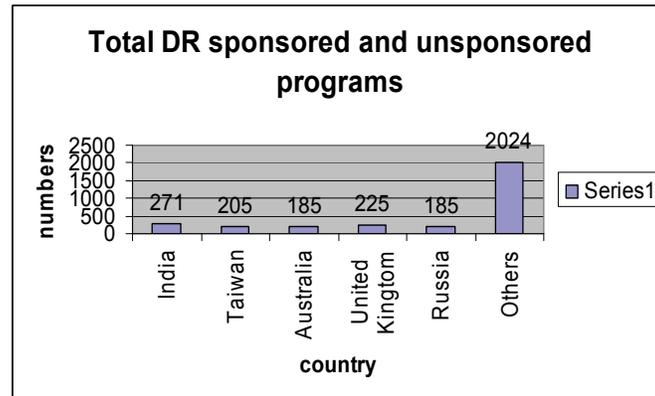
3) Rule 144A Depository Receipts are special ADRs that can only be sold to Qualified Institutional Buyers as a private placement and are not subjected to the same rules and regulations as ADRs. A Qualified Institutional Buyer is an institutional investor that can trade privately placed unregistered securities with other qualified institutional buyers. Consequently, these cannot be bought on the public exchanges or over the counter.



Source: Bank of New York Mellon.

According to Bank of New York Mellon(BNY), out of 3137 DRs Program- 1698 are trading in OTC (Pink Sheets), 96 are traded in NASDAQ, 287 are traded in New York stock exchange, 116 are traded in Luxemburg stock exchange, 159 are traded in London stock exchange and 781 are others.

According to the midyear report given by BNY Mellon (June 2009) , Total available DR programs grew by nearly half, rising to 3,096 from 2,149 a year ago, largely due to the changes in U.S. regulations previously mentioned. India remains the country with the largest number of DR programs at 271 while the United Kingdom and Taiwan, with 225 and 205 respectively, comprise the remainder of the top three. Industry-wide, DR programs from issuers in 76 countries were available to investors at the half-year mark.



Source: BNY Mellon (2009 report)

In July 1991, the Indian government announced the New Industrial Policy (NIP) to liberalize its economy. The Securities and Exchange Board of India (SEBI) was created with statutory authority to oversee India's capital markets in 1992. SEBI initiated its reform process and introduced changes in several areas of Indian capital market. Therefore, in September 1992, government permitted Foreign Institutional Investors (FIIs) to invest in Indian securities under specific guidelines issued by the Reserve Bank of India (RBI) and the SEBI. Other sources of foreign investment include Non-Resident Indians (NRIs), Overseas Corporate Bodies¹⁶ (OCBs), DRs and Euro-Convertible Bonds. FIIs are required to register themselves with SEBI before they invest in the Indian capital market. Application for registration should be made by FIIs to SEBI in the prescribed form in duplicate. Indian regulations allow FIIs to buy and sell Indian securities with their total holding of an individual firm being restricted to 30 per cent of issued capital (the limit can be raised to 49% with the approval of the board of directors of the company concerned).

The Indian DRs can be denominated in any freely convertible currency and may be listed on any international stock exchange. Initially, only one-way fungibility of DRs was allowed, i.e., investors owning DRs were allowed to convert them into underlying Indian shares after a delay of 45 days from the closing date of the issue. However, once converted, these Indian shares could not be converted back into DRs.

Mutual funds are permitted to invest in ADRs/GDRs up to 10 per cent of the net assets managed by them as on the date of the last audited balance sheet, subject to a maximum of \$50 million per mutual fund. From April 1992 to June 2001 seventy-two Indian firms took advantage of this opportunity and raised foreign equity capital by issuing eighty-five DR programs listed on the foreign markets. These programs have contributed positively towards the aggregate foreign investment coming into India.

Indian DR programs are listed at Luxembourg Stock Exchange (LxSE), London Stock Exchange (LSE), NASDAQ and New York Stock Exchange (NYSE). Of all the emerging markets,

India has maximum number of DR programs. Initial DR programs by the Indian firms were listed at the LxSE due to the mild securities' regulations and the easy listing norms of the Luxembourg market.

India entered the international arena in May 1992, with the first GDR issue by Reliance Industries Limited on LxSE. In November 1992, Grasim Industries also issued their GDR program on the LxSE.

Then, the GDR markets witnessed a lull till 1993-end in the wake of the securities scam and the consequent fall in the domestic markets.

A high degree of foreign listing activity by the Indian firms during 1994 and 1996 was also attributable to the (a) increased allocation of investible funds by the international investors to the emerging markets like India; and (c) desire of many Indian firms to raise the funds during the boom phase of the domestic markets so as to get a better pricing for their DR programs.

There were infrequent fresh DR listings by the Indian firms during 1995, mainly due to the uncertain domestic political environment.

Similarly, there was a two-year lull period in foreign listings activity during 1997 and 1998 owing to the economic crises in the South-east Asian markets.

Indian firms regained momentum during 1999 with the successful ADR issue by Infosys Technologies Limited.

During 2000, there was a spurt in number of Indian foreign listings because of the fresh policy initiatives by Indian government, which simplified approval mechanisms for software, information technology, telecommunication, biotechnology and pharmaceutical firms for issuing DR programs in the foreign markets. These firms used the foreign listings to (a) attain a better valuation for their firms; and (b) meet their requirements of large amount of funds, not easily available from the Indian markets.

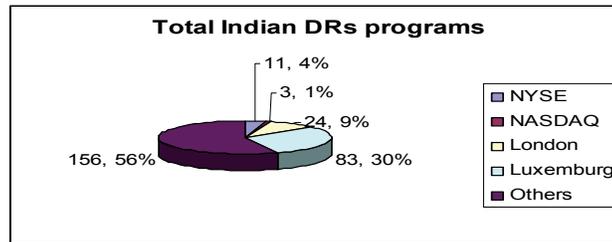
The Reserve Bank of India introduced two-way fungibility in February 2002. A two-way fungibility means foreign investors owning Indian DRs and Indian companies can convert their ADRs/GDRs into shares tradable at Indian stock exchanges and vice-versa. There are no end-use restrictions on GDR/ADR issue proceeds, except restrictions on investment in stock markets and real estate. The two-way fungibility guidelines enabled a non-resident investor to purchase local shares of an Indian Company through an Indian stock broker and convert them into ADRs that were eligible to be traded on the American stock exchange. All SEBI registered brokers would act as intermediaries in the two-way fungibility of ADRs.

In 2003-04, Resident shareholders of Indian companies who offer their shares for conversion to ADRs/GDRs were allowed to receive the sale proceeds in foreign currency subject to the condition that the conversion to such ADRs/GDRs should have the approval of Foreign Investment Promotion Board.

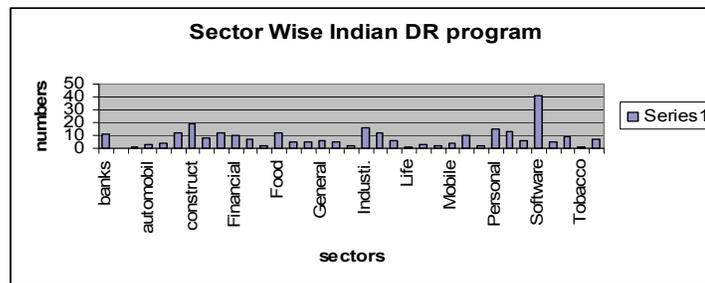
The sudden skyrocketing of depository receipts in 2005-06 came with the Monetary Policy of 2005-06 as there was a major revision to the guidelines on ADRs/GDRs for unlisted companies. Unlisted Indian companies were allowed to sponsor an issue of ADRs or GDRs with an overseas depository against the shares held by its shareholders. Further, the facility of sponsored ADR/GDR offering by unlisted companies was to be made available to all categories of shareholders of the company whose shares are being sold in the ADR/ GDR market overseas. The huge increase in 2005-06 was also attributable to the booming Indian stock markets that offered the corporate sector the opportunity to issue equities abroad. The boom in the Indian industry is being translated into growing domestic production and exports, along with companies setting up new capacities. Indian companies have raised a record level of capital in 2005-06 both from the

domestic capital markets and foreign capital markets. Some companies went in for simultaneous offerings in domestic and foreign markets. The expansion spree of the Indian corporate sector coupled with easing of ADR/GDR norms by the Ministry of Finance resulted in a commensurate rise in the amounts raised through ADR/GDR issues in 2005-06.

Due to all these changes in rules and regulations of SEBI, India has highest DRs programs i.e. 277 DR programs (BNY Mellon mid year report, June 2009). Out of 277 DR programs – highest DR are traded in Luxemburg Stock Exchange due to less stringent rules and regulations of listing in that exchange and lowest in NASDAQ due to strict rules of US general accepted accounting principles and their strict disclosure requirements.



Source: Bank of New York Mellon



Source: Bank of New York Mellon DR directory.

If we look at the Indian DR programs by sector wise division, we found that software computer and services has 41 DR programs while other sectors like life insurance, tobacco, aerospace and defense has just one DR program.

Overall Indian DRs have generally been well received by the international investors. So in future it is expected that more Indian firms will tap the foreign markets with DR programs for meeting their capital requirements.

RESULTS

We used the conventional event study methodology where event date is taken as the listing date. We follow four steps to proceed:

Firstly we defined the event and the event day(s). Secondly, a model for estimating the returns was selected and returns are estimated. Thirdly, abnormal returns (actual minus estimated returns) were calculated to measure the stock price reactions around event day. Lastly, statistical significance of the ARs is calculated to know the impact of the event on firm's stock returns of domestic stock market.

The event day is the listing date when the stock was listed on New York stock exchange or on Luxemburg stock exchange taken as 0. we taken the event window as (-20, +20) stock work-

ing days and used -108 days as estimation period which is 20 days before the listing date so that the abnormalities done before the listing event could be avoided.

Estimation Period		Pre-Listing Period		Listing Day	Post-Listing Period	
-128	-21	-20	-1	0	+1	+ 20
Time (in days)						

We assume that, at equilibrium, the one factor market model specification of the securities return generating process is appropriate. The following market model is used to estimate the parameters used in calculating:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

R_{it} = rate of return of the common stock of the firm on the t day.

R_{mt} = rate of return of market index on the t-day.

α_i and β_i are the estimated parameters that vary from security to security. α_i is the average rate of price change not explained by the market returns while

β_i is a parameter that measures the sensitivity of R_{it} to market index.

It is assumed that the random disturbance (error) term ε_{it} satisfies the assumptions of the ordinary least squares (OLS) regression model. Expected value of ε_{it} is zero.

We had taken one factor market model to convert to regression model so that parameters of each security can be found out by taking the estimation period data of stock return and market index of -108 working days before 20 working days of listing date. These parameters are then used to found out expected return of 41 working days i.e. -20 before listing, 0-event date and 20 after listing.

$$ER_{it} = \alpha_i + \beta_i R_{mt}$$

Where, ER_{it} = Expected return on stock i at period t dependent on R_{mt} .

R_{mt} = Rate of return of market index on the t-day.

Then find out the actual return by taking the adjusted closing prices data i.e. by using the formula:

$$R_{it} = P_t - P_{t-1} / P_{t-1}$$

Then ARs was computed as the difference between the actual ex-post returns and the expected returns estimated using the market model of returns.

$$AR_{it} = R_{it} - ER_{it}$$

Next, the abnormal returns on individual stocks are cross-sectionally averaged in event time to calculate the average abnormal returns (average excess returns):

$$AAR_{it} = \sum_{i=1}^N AR_{it} / N$$

Where AR_{it} is the abnormal return for stock i on t trading day relative to the event date.

N is the number of foreign listed firms in our sample.

Further, to measure the snowballing impact of firms' foreign listing decisions around listing date, cumulated average abnormal returns (CAAR) for the different holding period are calculated. Over an interval of two or more trading days beginning with day T_1 , ending with T_2 , the cumulative average abnormal return is

$$CAART1, T2 = \frac{1}{N} \sum_{i=1}^N \sum_{t=T1}^{T2} AR_{it}$$

Finally, tests of statistical significance are conducted to know whether the AR, AARit and CAARit are statistically significant or not.

$$Z_{it} = \frac{\sum SAR_{it}}{\sqrt{N}}$$

Where, SARit = Standardized abnormal return of i stock at period t.

N = Number of companies listed in our sample.

To check the robustness of the results we also run the following dummy variable regression:

$$AAR_{it} = \alpha_{it} + \beta_{1t} D_{1t} + \beta_{2t} D_{2t} + \beta_{3t} D_{3t} + e_{it}$$

Where, D₁ = Dummy Variable having value equal to 1 during pre-listing period and zero otherwise.

D₂ = Dummy Variable having value equal to 1 at listing date and zero otherwise.

D₃ = Dummy Variable having value equal to 1 during post-listing period and zero otherwise.

e_{it} = error term of i stock at period t.

Table 1
Sample and operational definition of terms used

S. No.	Sec tor	Company Name	Listing Ex-change	Listing Date
1	IT	Patni Computers System Ltd.	NYSE	7 th dec,2005
2	IT	Satyam Computers Ltd.	NYSE	18 th may,2001
3	IT	Wipro Ltd.	NYSE	24 th oct,2000

Event Date: The date of listing in NYSE stock exchange taken as 0.
 Estimation Period: -108 working days before -20 working days.
 Window Period: : -20 to +20 working days

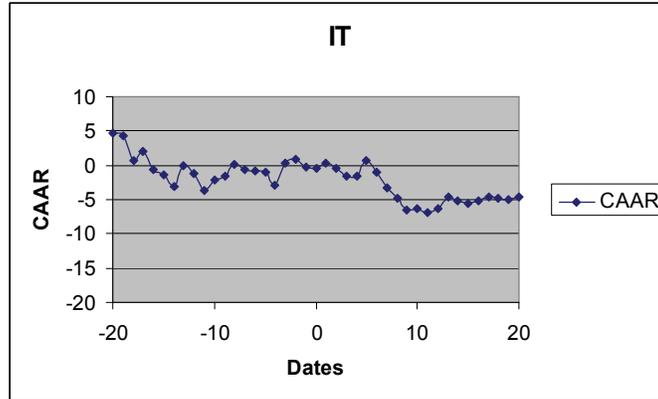
Table 1: Sample of Three IT companies

Dates	PATNI	SATYA M	WIPRO	AAR	CAAR	n	cumm zit	Σzit/√t
	AR1	AR2	AR3					
-20	0.089166	8.14264 1	5.56021 7	4.59734 2	4.59734 2	1.407692	1.40769 2	1.40769 2
-19	0.386822	-1.896	0.45651 3	-0.35089	4.24645 4	-0.0496	1.35809 2	0.96031 6
-18	-2.17861	-5.49655 2.53290	-2.98411 1.72214	-3.55309 1.27427	0.69336 2	-1.42021	-0.06211 0.25648	0.03586
-17	-0.43223	7	8	4	6	0.318595	1	0.12824
-16	-0.09095	-7.43573	-0.19211	-2.57293	-0.6053	-0.80496	-0.54848	0.24529
-15	2.33968	-3.40148	-1.04923	-0.70367	-1.30897	0.150497	-0.39798	0.25429
-14	0.742837	-5.49955 8.81790	-0.58591 0.83655	-1.78087	-3.08984	-0.43043	-0.82842	0.31311
-13	-0.67411	2	4	2.99345	-0.09639	0.813221	-0.0152	0.00537

-12	-2.03824	-1.20563	-0.35873	-1.20087	-1.29726	-0.68445	-0.69964	0.23321	-
-11	-3.6243	-4.11266	0.49519	-2.41392	-3.71119	-1.30694	-2.00658	0.63454	-
-10	-0.45968	3.21898	1.85180	9	1.53704	-2.17415	0.394696	-1.61189	-0.486
-9	1.385818	-0.14924	0.67875	4	0.63844	0.408986	-1.2029	0.34725	-
-8	-0.13824	5.21464	0.59310	3	-1.5357	0.05162	0.468043	-0.73486	0.20381
-7	-3.00587	0.30538	0.30126	7	-0.70246	-0.65083	-0.6848	-1.41966	0.37942
-6	2.352275	-3.18789	1	-0.17812	-0.82895	0.309157	-1.1105	0.28673	-
-5	-0.29587	1.36754	-1.45591	-0.12808	-0.95703	-0.07995	-1.19045	0.29761	-
-4	-0.46929	-1.66568	-3.81117	-1.98204	-2.93907	-0.66855	-1.859	0.45087	-
-3	2.463071	0.77861	6.64263	3.29477	0.35570	1.371392	-0.48761	0.11493	-
-2	0.36283	-0.61751	2.12444	3	0.62325	0.97895	-0.24739	0.05675	-
-1	0.106031	-2.73575	-0.86084	-1.16352	-0.18456	-0.33832	-0.58571	0.13097	-
0	-0.07836	-1.63916	1.12045	-0.19902	-0.38358	-0.07752	-0.66323	0.14473	-
1	2.310675	1.04374	-1.38695	5	0.65582	0.27224	-0.09775	0.02084	-
2	-1.63726	1.48709	-1.94616	-0.69878	-0.42653	-0.4619	-0.55964	0.11669	-
3	-2.55567	-1.15844	0.50409	-1.07001	-1.49654	-0.72768	-1.28732	0.26277	-
4	-0.62451	0.16805	-0.06603	-0.17416	-1.67071	-0.15026	-1.43758	0.28752	-
5	-0.69968	4.51613	3.33758	2.38468	0.71397	0.612744	-0.82484	0.16176	-
6	0.109249	-2.70156	-2.64044	-1.74425	-1.03027	-0.50992	-1.33476	0.25687	-
7	0.060846	-2.31791	-4.7674	-2.34149	-3.37176	-0.69333	-2.02808	0.38327	-
8	-0.6725	-2.15467	-1.23271	-1.35329	-4.72505	-0.51616	-2.54424	0.47245	-
9	0.619638	-3.26045	-2.76165	-1.80082	-6.52587	-0.44767	-2.99191	0.54625	-
10	1.931726	0.21410	-1.74569	0.13338	-6.39249	0.347269	-2.64464	0.47499	-
11	-1.19097	1.33428	-1.38728	-0.41465	-6.80715	-0.30729	-2.95193	0.52183	-
12	-1.68526	1.73286	1.34321	0.46360	-6.34354	-0.12387	-3.0758	0.53543	-
13	1.582739	1.81189	2.05594	1.81685	-4.52669	0.797005	-2.2788	0.39081	-
14	-0.18895	-0.91464	-0.61632	-0.5733	-5.09999	-0.20343	-2.48222	0.41957	-
15	-0.36258	0.31740	-1.19641	-0.41386	-5.51385	-0.17918	-2.6614	0.44357	-
16	1.047051	-1.98355	1.69316	0.25222	-5.26163	0.233851	-2.42755	0.39909	-
17	1.313257	-0.37872	1.14709	0.69387	-4.56775	0.413052	-2.0145	-0.3268	-
18	-0.52224	-1.14567	0.83772	6	-0.27673	-4.84448	-0.16927	-2.18378	0.34968

			1.96307						-
19	-1.28424	-1.07266	2	-0.13127	-4.97575	-0.24693	-2.43071	0.38433	
		0.78612	2.13334	0.31056					
20	-1.98777	7	8	7	-4.66519	-0.22082	-2.65153	-0.4141	

Graph1: CAAR OF IT Companies



CONCLUSION

Firms in our overall sample of three IT listings record (a) insignificant average abnormal returns of 0.0 -0.009 percent per day during the pre-listing period; (b) insignificant average abnormal returns of -0.199 percent on the listing day; and (c) insignificant average abnormal returns of -0.214 percent per day during the post-listing period. The magnitude of decrease in AARs during the pre-listing period is feeble compared to their subsequent increase in AARs on the listing day and during the post-listing period. Our overall sample seems to be affected by the foreign listings but not statistically significantly.

The CAARs for the entire event period are highly insignificant. All increases in CAARs are wiped out by the subsequent declines in CAARs and the figures though fluctuating and insignificant, remain positive on the first day of post-listing period. Overall it looks that cross listing on other stock exchanges have an insignificant impact on the prices of the underlying domestic shares. These results are confirmed by dummy variable regression and t test which shows that IT stock returns are not statistically significantly different in pre-listing and post-listing period.

Thus contrary to the results of the previous studies (Alexander et al: 1988, Foerster and Karolyi:1993) which have shown substantially lower post listing returns for the internationally listed stocks, we find no substantial difference in pre and post listing returns of our sample stocks in the domestic market. This might be due to the increased integration of stock markets worldwide. Thus, we conclude that we reject our hypothesis in which we assumed that there is a significant positive abnormal return in the domestic stock market around the listing dates. Our results tell us that there is no particular trend in the domestic stock market around the listing dates particularly the sample taken by Indian IT Companies.

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FINANCIAL DEVELOPMENT, SAVINGS AND ECONOMIC GROWTH IN LESOTHO: EVIDENCE FROM TRIVARIATE CAUSALITY TEST

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Abstract: The debate on the direction of causality between financial development and economic growth has been on-going since 19th century. The case of Lesotho has not been an exception. The paper attempts to re-examine the relationship between financial development and economic growth in Lesotho in a dynamic way by including savings as an intermitting variable - thereby creating a simple trivariate causality model. This was intended to improve the result of the previous studies. Using the co integration and Vector Error Correction techniques, the results of this study reveal that financial development does not cause economic growth in Lesotho. The result also shows that neither economic growth nor private savings Granger cause financial development and finally the result reveals uni-directional causality between financial development and private savings. These results however did not deviate much from the results of the bivariate case carried out by the previous studies in Lesotho. In other words, the results did not meet the prior expectations that savings could be a linking factor between financial development and economic growth and as a result could improve the results of the previous studies.

INTRODUCTION

The relationship between financial development and economic growth has been widely studied in many developing countries. One of the most complex and empirically unsettled subjects in economics is the explanation of the process of economic growth. The current disarray in growth economics is not only a topic of analytical interest but also of practical importance. One of the controversies in growth analysis is the relative role of financial sector in driving economic growth. In fact, part of the controversies has been whether or not financial development contributes positively to economic growth (Apergis, Filippidis & Economidous, 2007). Recent years have witnessed an increasing interest on the role of financial sector in economic development. Subsequent analyses have built on these earlier ideas by developing a fuller understanding of the various functions performed by the financial system - mobilizing savings, allocating investments and capital funds, managing risks - in supporting the process of economic growth (Levine, 1997).

The significant nexus of financial sector development and savings mobilization has not been adequately explored empirically for most developing countries given the overall low savings rate of many developing countries' economies in recent years and the fact that a substantial number of developing countries have undertaken a series of financial reforms recently to improve economic performance (Baliamoune-Lutz, 2006). It is widely recognised that developing countries often lack appropriate financial systems; one that efficiently pools the savings of diverse households to make them available to borrowers. In principle, financial development can strengthen the overall savings mobilization process and channel financial resources to fuel economic development (Harrison, 1996).

The debate concerning the role played by the financial sectors in economic growth through the mobilization of savings has become an issue that deserves attention in most developing countries. This is because a better understanding of the way finance affects savings performance al-

lows policy makers to evaluate the costs and benefits associated with liberalizing and deepening financial systems, thus enabling the formulation of policies. This understanding is critical for achieving the development goals of promoting financial stability and strengthening growth. It is worth noting that saving is not only considered important for investment but it is also an important aspect for macroeconomic stabilization (Leff & Sato, 1987). Lesotho being one among the developing countries did not however, escape from financial and economic challenges.

By the standard of developing countries, Lesotho's financial sector is considered to be underdeveloped (CBL, 2005). The sector comprises three banks, five insurance companies and twenty-one registered money lenders mostly located in the urban areas. As a result, financial intermediation in the country, particularly in the rural areas, is at the low ebb. Over the years, Lesotho financial sector has undergone several reforms aimed at enhancing financial efficiency. The structural reform process in Lesotho's financial sector commenced in 1998 and was completed a year later. Most of these reforms emanated from the privatisation programme which was authorized in 1995 and accomplished with some regulatory reforms. One of the major reforms was the liquidation of Lesotho Agricultural Development Bank and the subsequent privatisation of Lesotho Bank in 1999. These reforms however, created a gap in the provision of financial services to the small and medium sized enterprises in the rural areas. The gap was narrowed consequently by the establishment of the Lesotho Post Bank (LPB) in 2004, which utilized a wide network of branches across the country. The LPB operates under a restricted licence by which it mobilises deposits but does not extend credit (CBL, 2005).

However, despite the many reforms that have taken place in the financial sector, the impact of the financial institutions have not been felt in the economic growth of Lesotho. This is quite an alarming situation that calls for a need to investigate further the relationship between financial institution and economic growth in Lesotho. The measure of institutional importance of credit to private sector for instance shows that financial institutions have had a decreasing role in provision of credit to the private sector. The distribution of credit amongst those who have access to banking services is skewed in favour of a few large institutions and companies. During the periods 1983-1992, credit to private averaged 12.77%, increased to 19.83% during 1993-2000 and to 37% during 2001-2007. Although this ratio has been increasing in recent years, this level is considered low. Comparable countries in the SACU region realize higher ratios than what Lesotho has in place. For example, Botswana and Namibia realizes on the average 62% and 74% credit to private sector respectively. It suggests that the financial institutions in Lesotho are becoming less important channels of distributing credit to the private sector, a factor behind the low levels of savings and investment as well as growth. Theoretically, a decreasing share of private sector credit would mean the government crowds out private investors in the credit market or lower bank efficiency (CBL, 1985; 2007).

The ratio of credit to deposits also fluctuated within the periods from 1982 to 2007. During 1983-89, credit to deposit ratios averaged 25.4%, averaged 24% during 1990-1999 and 33.8% on average during 2000-2007. Deposits not issued are either invested in domestic treasury bill, mainly to meet the liquidity requirements, or transferred to South Africa for the alleged reasons that a risk differential exists between Lesotho and South Africa. Also, there are limited investment opportunities in the local market. The presumed risk differential is compensated for by adding a premium on domestic lending rates which keeps them higher than comparable rates in South Africa (CBL, 2007).

Interest rate has maintained an unstable trend over the years and continues to rise in recent years. During 2006-2007 in particular, inflationary pressures driven by food and oil prices influ-

enced policy makers in the region to increase interest rates. This was contrary to interest rates cut in the United States which sought to address economic slowdown threat. The average prime lending rates in Lesotho within the years 2006 to 2007 also rose from the average from 13.50 per cent to 15.43 percent. These percentage changes followed those in the South Africa prime lending rate which rose from 12.00 percent to 14.50 percent during those fiscal years. The rise in the South African lending rate tracked a series of upward adjustments of the repo rate by South Africa Reserve Bank (SARB). The divergence in movements of regional and international interest rates implies the gap between these interest rates has widened. This contributed to the appreciation of currencies in the region against the US Dollar (CBL, 2007).

However, contrary to some of the financial indicators mentioned above including bank liquidity ratio, interest rate spread coupled with the structure and composition of financial sector in Lesotho, the level of savings have taken a different trend in recent years. The ratio of savings to GDP was -2.70% during the years 1983-1987; 9.15% during 1988-1992; 22.34% during 1998-2002 and stabilizes around 21.23% during 2003-2007 (CBL, 1985; 2005).

Table 1 Savings Rate and GDP Growth in Lesotho (1983-2007)

Years	1983-87	1988-92	1993-97	1998-2002	2003-2007
Savings/GDP	-2.70	9.15	22.34	18.05	21.23
GDP	3.2	6.28	4.3	2.08	4.48

Source: Central Bank of Lesotho

It is clear from the table 1 there are fluctuations in the GDP growth mainly due to the construction of the Lesotho High Water Project (LHWP) which had a significant effect on Lesotho growth rate. Lesotho's rate of growth grew at approximately 2.8% per year in the period prior to LHWP (1980/81-1986/87), averaged 6% per year during the LHWP period (1987/88-1997/98), and then slowed to about 3% per year after the project was completed (1999/00-2003/04) (World Bank, 2005).

Aziakpono (2003) found that while the development of financial intermediation has the potential to influence economic growth positively, such impact is not significant. Furthermore, Motelle (2008) used a model of augmented production function, to examine a possible channel by which the banking industry can make its contribution to the productive capacity of the economy. His findings indicate that there is a relationship between credit and output and therefore a financial development plan can benefit economic growth in Lesotho. Motelle (2008) concluded that finance has the potential of stimulating economic growth in Lesotho. Some of the studies conducted by (Braithmoh, 2003; Chakela, 1994; Foulo, 1998; Letete & Paramaiah, 2009) concentrated on the determinants of aggregate savings, household savings, financial savings and private savings. These studies did not attempt to address links between financial development and economic growth. On this account, the main objective in this paper is to examine the dynamic causal relationship between financial development and economic growth in Lesotho by including savings as an intermitting variable thereby creating a simple trivariate causality model. The study investigated this by providing answers to the following questions fills the gap by using the savings variable as a link between financial development and economic growth, using a different methodology and to compliment some previous studies on the finance-growth debate in Lesotho. The main aim of this study is to use saving as a link to investigate the relationship between financial development and economic growth in Lesotho under a trivariate causality framework.

REVIEW OF LITERATURE

The link between economic growth and financial development has been a widespread subject of empirical research in the recent years. The question is whether economic growth influences

financial development or vice versa. The theoretical relationship between financial development and economic growth goes back to the study of Schumpeter (1912) who emphasizes the positive influence of the development of a country's financial sector on the economic growth of that country and argues that the services of the financial sector are necessary for a country's economic growth (Dritsaki & Dritsaki-Bargiota, 2005).

A well functioning financial system would induce technological innovation by identifying, selecting and funding those entrepreneurs who would be expected to successfully implement their products and productive processes. (Vazakidis and Adamopoulos 2009). The financial expressionists, led by McKinnon (1973) often referred to as the "McKinnon-Shaw" hypothesis contend that financial liberalization in the form of an appropriate rate of returns on real cash balances is a vehicle of promoting economic growth. The endogenous growth theory supporters reached similar conclusions with the McKinnon-Shaw hypothesis by explicitly modelling the services provided by financial intermediaries such as risk-sharing and liquidity provision (Klenow & Rodriguez-Clarke, 1997). A well developed financial sector is expected to boost savings through increased efficiency in intermediation. A deeper financial system should be capable of providing alternative saving instruments that more adequately match individual preferences, risk-averse and income profile

The issue of whether the financial development causes economic growth or the reverse lead to the debate on the causal links between financial development and economic growth. Economists such as Levine and Zervos (1998) have argued that more developed financial systems promote or "lead" economic growth. Well-developed financial system may assist in the mobilization of savings and facilitate investment by identifying creditworthy borrowers, pooling risk, and reducing transaction costs. Singh and Weisse (1998) as cited in Shan and Jianhong (2006) argued that economic development creates additional demands for financial services, which in turn brings about a more developed financial sector.

Levine (2003) breaks the primary function of financial sector into five basic functions: mobilization of saving, allocation of resources, hedging and pooling risks, easing exchange of goods and services and exerting corporate control. Financial development links the financial markets and the market for goods and services or the real sector through the credit markets (Beck, Levine & Loayza, 2000) contends that the pace and pattern of economic development are a function of the relationship between growth in (a) labour specialization, and (b) extent of the market for goods and services. Innovations in money and finance tend to increase the size and extent of exchange relationships or markets leading to increasing returns of scale and technical change. Money reduces transactions' costs and risk for contemporary exchanges across space and time. Economic growth may decline if investment demand falls in the short run due to higher real interest rate. In that case, an increase in saving is associated with a contemporaneous decrease in economic growth. On the other hand, the long run effect of changes in real interest rates may be insignificant, as households reach a steady state level of savings.

According to Ghirmay (2004) can be classified into two major groups. The first group consists of those that used cross-country growth regression methods in which the average growth rate of per capita output is regressed on some measure of financial development and a set of control variables. The second group consists of those that used time series data of individual countries to investigate the causal relationship between the two variables. The problem with the pure cross-country studies is well documented in the literature. Hence, dynamic panel data methods is used in recent empirical studies as a way to control the potential sources of biased coefficient estimates in cross-country regressions (Levine, Loayza & Beck, 2000). Although there are many ap-

proaches in estimating economic growth models in literature but notable differences seem to appear in the thematic views, choice of variables, estimation procedures and findings.

Achy, (2005) investigated the effect of financial liberalization on savings, investment and growth in MENA 'countries' using panel data approach. The study used five measures for financial development, namely total liquid liabilities of financial intermediaries as a percentage of GDP, deposit money banks assets as a share of total assets, private credit by deposit money banks to GDP, private credit by deposit money bank to total domestic credit and financial liberalization constructed on the basis of available information. The result shows that the coefficient of economic growth is positive and significantly robust across the five measures of financial development. It reveals a positive relationship between economic growth and private savings.

The link between levels of financial development and economic development by using data from more than 80 countries from 1969 through 1989 was investigated by King and Levine (1993). To measure financial development they constructed four indicators, namely the ratio of liquid liabilities to GDP, the importance of deposit bank relative to the central bank in allocating credit, the share of credit issued to non-financial institutions in total credit and the share of credit issued to non-financial institutions in GDP. Using cross country regressions and after controlling for a set of country and policy characteristics, they found that higher levels of financial development are positively associated with faster rates of economic growth and physical capital accumulation. They also postulated that financial development is a good predictor for long-run economic growth over the next 10 to 30 years. These findings confirm that finance does not only follow economic activity and that the strong correlation between the level of financial depth and economic growth does not simply reflect a positive association between contemporaneous shocks to both financial and economic development.

Levine, Loayza & Beck (2000) investigated the impact financial development has on long-run growth using a cross-sectional sample of 74 developed and less developed countries over the period 1960-1995. They found that the strong positive relationship between financial development and output growth can be partly explained by the impact of exogenous components like finance development on economic growth. In his study, Aziakpono (2003) employed two indicators of financial intermediation to investigate the impact of financial development in Southern Africa. The first indicator of financial intermediation used was the ratio of private credit to nominal GDP where private credit is the credit extended to the private sector by commercial banks. The second indicator of financial intermediation used was the ratio of liquid liabilities of commercial bank to nominal GDP which provided an alternative to a broad deposit plus time and savings deposits.

Baliamoune-Lutz (2006) also investigated the short and long-run dynamics linkages between financial reform and the mobilization of savings in Morocco using Vector error-correction model. In the short run the result shows a positive influence of financial development on private savings but no reverse causality was found to run from private savings to financial development. The result also indicated that in the long-run, savings have a stable relationship with financial reform but the influence of interest rates remains negative.

Vazakidis and Adamopoulos (2009) investigated the causal relationship between financial development and economic growth for Greece for the period 1978-2007 using a Vector Error Correction Model (VECM). Economic growth was measured by the rate of change of real GDP, while financial development defined as the credit market development is expressed as the domestic bank credits to private sector as a percentage of GDP.

A generic growth model was estimated using modern multivariate cointegration technique developed in Johansen (1988). This was complemented by Granger causality test to establish whether financial development is supply-leading or demand-following. Financial intermediation ratio was proxy by $M2/GDP$ ratio while bank credit to private sector as a ratio of GDP was used to measure financial development. The study revealed that despite the efforts to streamline (re-structure) the financial sector and liberalize the regulations concerning financial institutions and markets, which in part was intended to lead to efficient mobilization and channelling of savings to the private sector investment and, as a result, contribute positively to economic growth, Uganda's economic growth trends have remained illusive with GDP declining from 7.8 % in the late 1990s to about 5% in the mid 2000s.

A number of these studies as mentioned above used panel cointegration and static analysis and have also concentrated so much on the relationship between financial development and economic growth. Maimbo and Mavrotas (2004) in an attempt to investigate the causal nexus between savings and economic growth in Zambia using data from 1950/1951 to 1998/1999; found evidence of a unidirectional causality from economic growth to savings, thereby repudiating the classical view that saving has been the engine of economic growth. Using five-year averages of the economic growth rate and savings for OECD countries as well as a larger sample, Anoruo and Ahmed (2001), in a study on the causal relationship between domestic savings and economic growth in seven African countries, found savings to Granger cause growth in Congo, while in Ghana, Kenya, Nigeria and Zambia, it was economic growth, which Granger causes savings.

Pradhan (2009) examines the causal nexus between financial development and economic growth in India in a multivariate VAR model. The empirical analysis was based on cointegration and causality test. The cointegration test found the presence of long run equilibrium relationship between financial development and economic growth. The Granger causality test found the existence of bidirectional causality between money supply and economic growth, bank credit and economic growth, money supply and foreign trade, and market capitalization and foreign trade. It also confirmed the unidirectional causality from market capitalization to economic growth, foreign trade to economic growth, money supply to market capitalization, bank credit to market capitalization, and money supply to bank credit. Waithiama (2007) used a complex dynamic specification that included lagged dependent and the independent variables to estimate the saving function for Kenya for the period 1960-2005. The author established the relationship between gross Domestic Savings (GDP) and GDP growth rate on one hand and the share of investment on the other hand.

Odhiambo (2007) utilized the dynamic Granger causality test methodology in his analysis to determine the relationship between financial development, savings and economic growth in Kenya. Odhiambo (2007) used broad money ($M2/GDP$) as proxy for financial development and economic growth measured by per capita income (Y/N). Hendry's general to specific method was employed to estimate the trivariate causal relationship between financial development, savings and economic growth. Using the cointegration and error-correction techniques, the empirical result from the analysis revealed that there is a uni-directional causal flow from economic growth to financial development. The result also showed that economic growth Granger causes savings, while savings drive the development of the financial sector in Kenya. This shows that both economic growth and saving Granger cause financial development in Kenya.

Using a trivariate causality framework, Odhiambo (2008) used foreign capital inflow as an intermitting variable between savings and economic growth in South Africa. The cointegration result based on the error-correction mechanism, shows a bi-directional causality between savings

and economic growth to prevail in the short run and a distinct unidirectional causal flow from economic growth to savings to dominate in the long run. Odhiambo (2008) found growth-led savings to predominate in South Africa. The results also showed that foreign capital inflow and savings Granger-cause each other, while economic growth Granger caused foreign capital inflow.

METHODOLOGY

Data Type, Sources and Estimation Methods

The analysis is based on secondary time series data for the period 1983-2007. The data used in the study was obtained from various publications including International Financial Statistics (IFS), Central Bank of Lesotho Quarterly Reviews and Annual Reports, and IMF papers. The measure of the degree of monetization in the economy, the monetization variable is designed to show the real size of financial sector of a growing economy in which money provides variable payment and saving services. It also gives a direct link between savings and financial intermediation (Kar and Pentecost, 2000). The ratio of credits to private sector is another proxy chosen for financial development. This measure, more accurately represents the actual volume of funds channelled into the private sector. The log of real GDP per capita (y) is chosen as a proxy for economic growth. The Private savings variable includes all savings by households and private sectors.

Model Specification

The dynamic Granger causality test methodology used by Odhiambo (2007) in his analysis of the relationship between financial development, savings and economic growth in Kenya, he used trivariate causality test method. The model is however modified by including a second measure of financial development – the ratio of credits provided by financial intermediaries to the private sector to GDP (CREDIT/GDP).

The trivariate Granger causality test based on error-correction model is as specified below:

$$\frac{y}{N_t} = \alpha_0 + \sum_{i=1}^n \alpha_{1i} y/N_{t-i} + \sum_{i=1}^n \alpha_{2i} Z_{t-i} + \sum_{i=1}^n \alpha_{3i} S_{t-i} + \alpha_4 ECT_{t-1} + U_t \quad \dots (1)$$

$$Z_t = \varphi_0 + \sum_{i=1}^n \varphi_{1i} y/N_{t-i} + \sum_{i=1}^n \varphi_{2i} Z_{t-i} + \sum_{i=1}^n \varphi_{3i} S_{t-i} + \varphi_4 ECT_{t-1} + \varepsilon_t \quad \dots (2)$$

$$S_t = \gamma_0 + \sum_{i=1}^n \gamma_{1i} y/N_{t-i} + \sum_{i=1}^n \gamma_{2i} Z_{t-i} + \sum_{i=1}^n \gamma_{3i} S_{t-i} + \gamma_4 ECT_{t-1} + V_t \quad \dots (3)$$

Where

$Z_t = M_2/GDP$ and $Credit/GDP$ (Proxies for financial development)

$Z_t = Savings$

$y_t = The \log \text{ of real GDP per capita}$

$N_t = Per \text{ capita National income}$

$ECT_{t-1} = The \text{ correction term lagged one period}$

$U_t, E_t, \text{ and } V_t \text{ are error terms}$

Stationarity Test

A time series is said to be stationary if its mean and variance are constant over time and value of covariance between two time periods depends only on the distance or lag between the two time periods and not on the actual time at which covariance is computed (Gujarati 2006). Em-

empirical analysis using time series data require that each variable be stationary at the level in order to reduce spurious results that are likely to arise when variables of interest are non stationary. Therefore testing for the order of integration becomes crucial in modeling the relationship between financial development and economic growth in Lesotho.

The order of integration refers to the number of times a variable needs to be differenced in order to attain stationarity. A non-stationary time series is integrated of order 'k' if it has to be differenced k times before it becomes stationary. Any variable that has one or more unit roots is non stationary at its level, whereas if it does not need to be differenced for it to be stationary, it is said to be integrated of order zero and is denoted as $I(0)$. Also, the presence or absence of unit roots helps to identify some features of the underlying data generating process of a series Verbeek (2000). If a series has no unit root, it is characterized as stationary and therefore exhibit mean reversion in that it fluctuates around a constant long run mean. The absence of unit roots implies that the series has a finite variance which does not depend on time.

The traditional unit root tests are the Dickey and Fuller and the Augmented Dickey Fuller (DF and ADF). It has been observed that the size and power properties of the ADF test are sensitive to the number of lagged terms (K) used. However, alternative unit root test have been developed among these are GLS-transformed Dickey Fuller (GLS-DF) and Phillips – Perron (PP). The variables financial indicators (M_2/GDP), (CREDIT/GDP), savings (S_t), and economic growth (y_t/N) must be tested for stationarity before running the causality test. This analysis was carried out using ADF and Phillips - Perron tests. These tests are robust to a wide variety of serial correlation and heteroskedasticity.

Co-integration Tests

After confirming that all variables included in the causality test are integrated of order one, the next step is to test for the existence of a co integrating relationship between financial development (M_2/GDP), savings (S_t/Y) and economic growth (y_t/N). This study utilized the Johansen cointegration test procedure. If cointegration is detected between these variables, then the existence of granger causality in either way cannot be ruled out.

The Trace Test (λ trace)

It tests the null hypothesis that the number of distinct co integrating vector is less than or equal to Q against a general unrestricted alternatives $Q = r$. Where $r = 0, 1, 2, \dots, n-2, n-1$, and Q is the ratio of restricted maximum likelihood to the unrestricted maximized likelihood.

$$\lambda_{max}(r) = -2 \log(Q) = -T \sum_{i=r+1}^p \log(1 - \tilde{\lambda}_i) \quad \dots \dots \quad (4)$$

The Maximal Eigenvalue (λ_{max})

This concerns a test of the null hypothesis that there is r of co-integrating vectors against the alternative that r + 1 co-integrating vector. Thus, the null hypothesis $r = 0$ is tested against the alternative that $r = 1$, $r = 1$ against the alternative $r = 2$ and so forth. If the estimated value of the characteristic root is close to zero, then the $\lambda_{r,max}$ will be small. Where λ_i is the estimated values of characteristic root or the Eigenvalue and T is the number of usable observation, $r = 0, 1, 2, \dots, n-2, n-1$,

$$\lambda_{max}(r, r + 1) = -T \ln(1 - \lambda_{r+1}) \quad \dots \dots \quad (5)$$

The general form of the vector correction model is given by:

$$\Delta y_t = a_{0y} + a_{1y,t-1} + \Pi_y Z_{t-1} + \sum_{i=1}^n \Gamma \Delta Z_{t-i} \psi y W_t + \varepsilon_t, t = 1, 2, \dots, n \quad \dots (6)$$

Where $Z_t = (y_t^1, X_t^1)^1$, is an $m \times 1$ vector of endogenous variables $I(1)$ and w_t is a $q \times 1$ vector of exogenous or deterministic $I(0)$ variables.

Having confirmed the stationarity of the variables, the presence or non presence of co integration among the variables was examined. When a co integration relationship is present, it means that all the variables share a common trend and long-run equilibrium as suggested theoretically. Although co integration indicates presence of Granger causality, at least in one direction, it does not indicate the direction of causality between variables.

Vector Error Correction Model (VECM)

After the co integration between financial development, savings and economic growth has been accepted, the next step is to estimate a Vector-error correction model by including error-correction term (ECM_t) to investigate dynamic behavior of the model. Once the equilibrium conditions are imposed, the VEC model describes how the examined model is adjusting in each time period towards its long run equilibrium state (Gujarati 2006). Since the variables are supposed to be co-integrated, then in the short run, deviations from this long-run equilibrium will feed back on the changes in the dependent variables in order to force their movements towards the Long-run equilibrium state. Hence, the co integrated vectors from which the error correction terms are derived each indicating an independent direction where a stable meaningful long-run equilibrium state exists.

Trivariate Causality Test

If there is a lagged relationship between variables, one of the test, which is applied to determine the direction of relation in terms of statistical, is the Granger Causality test. The Granger approach to the question of whether x causes y is to see how much of the current y can be explained by past values of y and then to see whether adding lagged values of x can improve the explanation. Y is said to be Granger-caused by x if x helps in the prediction of y , or equivalently if the coefficients on the lagged x 's are statistically significant. It is also important to note that the statement “ x Granger causes y ” does not imply that is the effect or the result of x . Granger causality measures precedence and information content but does not by itself indicate causality in the more common use of the term. Granger Causality test also gives information about the Long-term relationship between the variables.

EMPIRICAL FINDING

The aim of this paper is to analyse the savings as a link to investigate the relationship between Financial Development and Economic Growth in Lesotho by presenting the stationarity test results of all the variables on first difference using two unit root test methodology: GLS-transformed ADF test and Phillips-Perron (1988) tests. The series on Private savings, broad money (M2/GDP) and private sector credit were not readily available on annual bases and therefore were transformed into annual basis through the method of linear interpolation.

Unit Root Test Results

The results of the ADF and PP tests with the deterministic components are presented in table 2. The null hypothesis is that, the variable has a unit-root whereas the alternative hypothesis is that the variable is stationary. The variable private savings is not stationary at levels but becomes stationary at first difference ‘with intercept’, ‘trend and intercept’ and ‘without trend and intercept’. Private sector credit becomes stationary in first difference in all. The GDP variable is stationary at second difference ‘with intercept’, ‘trend and without trend’ and ‘intercept’ while the broad money at first difference ‘with intercept’, ‘trend’ and ‘without trend and intercept’. Therefore, the null hypothesis that there is a presence of unit root in the variables at levels was accepted

while the null hypothesis that the variables have unit root at first difference and at second difference for GDP variables was rejected.

Co-integration Test Results

The existence of long-run equilibrium (stationary) relationships among economic variables is referred to in the literature as co integration. The co integration tests are meant to reconcile the short run response with their long-run effects. Therefore, to determine whether there exists a long run relationship among all the variables; private saving, financial development indicator (broad money) and economic growth, co integration approach by Johansen (1992), and Johansen and Juselius (1990) was used. The maximum eigenvalue (λ max) and trace (λ trace) tests statistics are used to estimate the co-integration rank r (the number of independent co integrating vector): Tables 4.2 and 4.3 show the result of the co integration test.

From Tables 4.2 and 4.3, the number of statistically significant co integrating vectors for Lesotho is equal to 1. The critical values for the trace statistics as defined in equation 1 are 32.54 and 7.74 for ‘None’ or $H_0 : r = 0$ and ‘At most’ 1 or $H_0: r \leq 1$ respectively and 0.003 for ‘At most 2’ or $H_0: r \leq 2$, while critical values for the maximum eigenvalue test statistic as defined by equation 2 are 24.79 and 7.73 for ‘None’ or $H_0: r = 0$ and ‘At most’ 1 or $H_0: r \leq 1$ respectively and 0.003 for ‘At most’ or $H_0: r \leq 2$.

Table 2: The Results of ADF and PP Tests for Unit Root

Variables Model		ADF			PP		
		Levels	1 st diff	2 nd diff	Levels	1 st diff	2 nd diff
Private Sector Savings	Intercept	-2.6393*** (-0.185286)	-3.7204* (-4.679564)	-	-2.9831** (-0.453788)	-3.7204* (-4.879564)	-
	With trend & intercept	-2.6207*** (1.047981)	-4.3738* (-4.822002)	-	-2.6387*** (1.678540)	-3.2367*** (-3.342473)	-
	Without trend and Intercept	-2.1935*** (1.443256)	-2.6603* (-3.000300)	-	-2.1021*** (-0.612873)	-2.6603* (-3.600386)	-
Private Sector Credit	Intercept	-1.5669*** (-0.701570)	-2.6318*** (-3.414072)	-	-2.6231*** (-1.675320)	-2.9850** (-3.314872)	-
	With trend & intercept	-2.0055*** (-1.876099)	-3.2367*** (-3.541173)	-	-2.3760*** (-1.803269)	-3.2367*** (-3.342473)	-
	Without trend and Intercept	-2.5632*** (-1.678760)	-2.6603* (-3.948362)	-	-2.0432*** (-0.187659)	-2.6603* (-2.948362)	-
M2/GDP	Intercept	-2.1324*** (-0.142894)	-3.7204* (-3.991167)	-	-2.5644*** (-1.564329)	-3.7204* (-4.891197)	-
	With trend & intercept	-2.6240*** (-0.219456)	-4.3738* (-5.229580)	-	-2.0564*** (-0.256487)	-4.3738* (-5.649584)	-
	Without trend and Intercept	-2.0344*** (-0.135894)	-2.6603* (-4.123786)	-	-2.6289*** (-0.437865)	-2.6603* (-4.153686)	-
LnGDP	Intercept	-2.3278*** (-1.980542)	-2.6264*** (-1.236754)	-3.7343* (-5.002820)	-2.5631*** (-1.765909)	-3.6286* (-2.990711)	-2.6348*** (-5.173924)
	With trend & intercept	-2.3744*** (-1.229675)	-2.0734*** (-1.985534)	-3.3738* (-4.991167)	-2.1456*** (-1.865490)	-3.6665* (-2.085436)	-4.3942* (-5.265157)
	Without trend and Intercept	-2.6899*** (-1.048708)	2.6311*** (-1.707883)	-2.6603* (-4.123786)	-1.5776*** (-1.564020)	-3.6225*** (-2.905641)	-2.6649* (-5.104601)

*, **, and *** imply 1%, 5% and 10% level of significance respectively. () implies the test statistics

As discussed above, the results of ADF and PP unit root tests indicate that all individual are stationary after first difference therefore, the series are expedient in a co integration analysis. As presented in Table 4.2 and 4.3, both the trace and maximum eigenvalue tests indicate the evi-

dence of one co integrating vector. This suggests the existence of long run relationship between the variables. The variables are said to be co integrated to each other.

Table 3: Co-integration Tests Results: Trace Test

Null Hypothesis	Alternative	Statistics	0.05%
Co integration between GDP, Priv_Sav/GDP and M2/GDP			
None * or $r = 1$	$r \geq 1$	32.5401	29.7970
At most 1 or $r \leq 1$	$r \geq 2$	7.7421	15.4947
At most 2 or $r \leq 2$	$r \geq 3$	0.0032	3.8414

* denotes rejection of the hypothesis at the 0.05 level

Table 4: Co integration Tests Results: Maximum Eigenvalue Test

Null Hypothesis	Alternative	Statistics	0.05%
Co integration between GDP, Priv_Sav/GDP and M2/GDP			
None * or $r = 1$	$r = 1$	24.7979	21.1316
At most 1 or $r \leq 1$	$r = 2$	7.7388	14.2646
At most 2 or $r \leq 2$	$r = 3$	0.0032	3.8414

Max-eigenvalue test indicates 1 co integrating equation at the 0.05% level

* denotes rejection of the hypothesis at the 0.05 level

Trivariate Causality Test Results

Table 5 :Trivariate Causality Test Results from the VECM

Independent Variables	M2/GDP VECM (2lags)		
	Dependent Variables		
	Dy/N	DM_2/GDP	$DPRIVSV/GDP$
DLy/GDP_{-1}	-0.055418 (-0.2604)	0.087342 (0.74133)	-0.024748 (-0.31442)
DLy/GDP_{-2}	-0.117494 (-0.39404)	0.129787 (1.03663)	0.057812 (0.71962)
DM_2/GDP_{-1}	0.935902 (1.84034)	-0.651542 (-2.78118)	0.153984 (2.32576)**
DM_2/GDP_{-2}	0.087452 (0.17744)	0.229517 (1.01274)	0.373942 (2.57190)**
$DPRIVSV/GDP_{-1}$	-0.119605 (-0.34578)	0.156218 (0.98155)	0.240826 (1.35880)
$DPRIVSV/GDP_{-2}$	-0.318091 (-0.81174)	0.273392 (1.51632)	0.079991 (0.69153)
ECM_{-1}	-0.240530 (2.04878)	-0.310223 (1.42023)	-0.401202 (2.60419)
R^2	0.397923	0.483446	0.525241

<i>F – Statistics</i>	4.055620	5.743070	6.788855
<i>Adjusted R²</i>	0.299806	0.3999267	0.447873

** and *** imply 5% and 10% level of significance respectively.

() implies the t-statistics

The estimation of equation 1 shows that there exists no relationship between financial development and economic growth in Lesotho. This result is not surprising owing to restrictive lending policies and credit ceilings by the central Bank of Lesotho. The distribution of credit is to those who have access to banking services and is skewed in favour of a few large institutions and companies. Indeed, the weakness of the financial system in extending credit to the private sectors for productive investments appears to be one of the reasons there appears to be no link between financial development and economic growth in Lesotho. If credits are extended to the private sectors, it will be channeled to proper investment which will lead to economic growth. Consequently, private domestic investment are not being financed with the deposit resources i.e. liquid liabilities of the commercial banks rather, the commercial banks invest these funds in South African banks for higher returns on investment.

Table 6: Summary of Trivariate Causality Test Results

Causality Test Variable	Causality	Conclusion
$\Delta Ly/N$ (dependent variable) $\Delta M_2/GDP$ and $\Delta S/GDP$ (Independent Variables).	-No Uni-directional causality from financial development to economic growth. -No uni-directional causality from private savings to economic growth.	-Financial development does not Granger cause economic growth - Private Savings does not Granger cause economic growth.
$\Delta M_2/GDP$ (dependent variable) $\Delta Ly/N$ and $\Delta S/GDP$ (Independent Variables)	- No uni-directional causality from economic growth to financial development. -No uni-directional causality from private savings to financial development	-Economic growth does not Granger cause financial development -Private Savings does not Granger cause financial development
$\Delta S/GDP$ (dependent variable) $\Delta Ly/N$ and $\Delta M_2/GDP$ (Independent Variables)	-No unidirectional causality from economic growth to private savings. -There is a uni-directional causality from financial development to private savings.	-Economic growth does not Granger cause private savings -Financial development Granger cause private savings

This result is however, in line with the result found by Bwire *et al.*, (2005) who found no causal link between financial development and economic growth in Uganda. The result also conforms to the findings by Berthelemey and Vardoulakis, 1998 whose estimates in their analysis did not corroborate the presumed positive influence of the financial systems’ development on growth. The result is also consistent with the result found by Mohapi and Motelle, 2007 who found no causal link between financial development and economic growth in Lesotho. The result however, is not in line with the conclusion of King and Levine (1993) that ‘finance seems importantly to lead economic growth’ This is not to say that financial development does not promote growth because both financial development and economic growth appear to have reinforced each other in course of the economic reforms and financial reforms that may have taken place in Lesotho.

The financial development estimates in equation 2 proxy (M2/GDP) result shows that neither economic growth nor private savings Granger causes financial development. This result is however inconsistent with the results obtained by Shan and Jianhong (2006) who supports the view that financial development and economic growth exhibit a two-way causality and against the finance-led growth' hypothesis. The result is also inconsistent with Liu and Calderon (2002) who found Granger causality to co-exist from economic growth to financial development. This result could be attributed to low level of income observed in Lesotho. It is observed in the Life-Cycle Hypothesis that one of the determinants of saving rate include rate of growth of per capita income. Savings and the level of income have a positive relationship. As the income level declines, savings rate also declines and impacts negatively on financial sector development and the reverse impacts positively on the financial development.

The ratio of broad money (M2) to GDP is found to have a positive impact on private savings. This implies that financial development drives private savings in Lesotho. This result is in contrast with the result found by Odhiambo, (2008) for South Africa whose results show a bi-directional causality between savings and economic growth to prevail in the short run and a distinct unidirectional causal flow from economic growth to savings to dominate in the long run. This could be as a result of low level of economic growth experienced in Lesotho. However, there was no co integrating vector dictated in the financial development proxy by private sector credit to GDP meaning that there is no relationship between private sector credit and other variables. The VECM model cannot therefore be applied since causality between the variables in the VECM is not expected to occur.

CONCLUSION

The study examined empirically the causal linkage between financial development and economic growth by including savings as an intermitting variable in a trivariate causality framework. All the variables were subjected through stationarity test methodology using the DF and Phillips Perron tests and they become stationary after first difference except the GDP variable that becomes stationary after the second difference. The Johansen's co integration test was also used which is appropriate for estimating the effects of non-stationary variables and finally the VECM was adopted to determine the direction of causality. The results of the estimation of the short run error correction did not support the prior expectation that when saving is included in the trivariate causality framework, it could alter the direction of causality and the magnitude of the estimates in the bivariate causality framework. The reason could be that the savings mobilized by the financial sectors have not been properly channelled to investors for investment. This result however, seems not to have deviated much from the bivariate result found by the previous studies. Thus, given the relatively weak financial systems, coupled with low returns and other institutional and structural problems, Lesotho may continue to lose the gains of financial intermediation. However, further work such as promoting domestic investment and encouraging banks to finance investment within the economy can enhance economic growth in Lesotho.

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