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**Determinants of Foreign Direct Investment
in Lesotho: Evidence from Cointegration and
Error Correction Modelling**

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Determinants of Foreign Direct Investment in Lesotho: Evidence from Cointegration and Error Correction Modelling ⁺

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Abstract

Lesotho, a land-locked least developed country, has however, recently seen a surge in foreign direct investment (FDI), allowing it to surpass most LDCs in attracting FDI. Open policies on investment combined with trade privileges, since the mid-1990s had led most FDI into the manufacturing sector. The FDI spillovers have accounted for generation of employment and foreign exchange, creation of industrial and exporting skills that though narrow in scope, could provide a base for longer-term FDI and industrial development.

We estimate the determinants of foreign direct investment in Lesotho, namely: openness of the economy, market size, trade and investment initiatives, and political instability between 1970 and 2001, using cointegration and error correction modelling. The evidence from this study supports the contention that most of the surge in Lesotho's FDI inflows is attributed to Lesotho's membership to regional, bilateral and multilateral trade agreements. Being a signatory to these trade agreements has helped replace the non-transparent trade barriers such as cumbersome tariffs and taxes with those stipulated under the regulations of the trade agreements.

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Though Lesotho saw an influx in FDI inflows over the past decade, and since FDI is dependent on temporary trade privileges, Lesotho has to face the challenge of full global competition once some of these trade privileges expire. The FDI strategy recommended is to retain existing investors and diversify investment. Key actions are developing a competitive base for manufacturing FDI; liaising more with its neighbour, South Africa; improving access to other large markets and building up its own capabilities in manufacturing, services and agriculture. The results also prove the deterrent effect of political instability on FDI, calling for the need to improve on the investor confidence through legitimate, democratic actions.

1. Introduction

The evolution of the international capitalist economy and the growth of the multinational corporations have been closely linked to the patterns of foreign direct investment (FDI) in Africa. Foreign direct investments represent a central part of the international political economy (Widstrand and Amin 1975). Made on the basis of monopolistic advantage or according to some other motive or driving force, FDIs represent an important tool in the spread of international capitalism.

For the purpose of receiving FDI, most countries in Africa have improved, typically within structural adjustment programmes, their regulatory frameworks, and have tried to increase investor confidence through the inclusion of multilateral investment and tax agreements pertaining to FDI (UNCTAD 1995). Since the role played by FDI in the process of a country's industrialization is crucial, empirical studies make it possible to draw useful lessons concerning the advantages and disadvantages of different trade and investment policies. The continued sluggish FDI growth worldwide and the rising protectionism in industrial countries however, threaten the prospects of developing countries, many of which have begun to reduce their trade barriers from very high levels

to expand exports and obtain net earnings that are needed to maintain adequate growth and to service external debt.

Lesotho like many other countries in Africa has opened up her economy to foreign investment by. Although modest, foreign direct investment is important for Lesotho. As noted in the UNCTAD Investment Policy Review for Lesotho (2003), her economy depends for growth, employment and export revenues on manufacturing sector that is almost entirely driven by export-oriented FDI in the apparel industry. However, much of the foreign direct investment in manufacturing has been driven by Lesotho being a signatory and a beneficiary to some international trade and investment agreements.

The launching of the World Trade Organization (WTO) trade policies in the past decades sought to enhance the conduciveness of inward investment environment. In particular, the General Agreement on Tariffs and Trade (GATT) and the agreement on Trade Related Measures (TRIMs) address the issues pertaining to protection and regulation of property rights of foreign companies through agreements on tariffs and other related aspects stipulated in the WTO investment regulations.¹ The African Growth and Opportunity Act (AGOA) has been another channel to improving the level of foreign direct investment in Lesotho. Under the current phase of AGOA, Lesotho and other beneficiaries can export to the EU and US duty free. This has complemented the Cotonou Agreement under which the EU is offering duty-free access to most products made in Lesotho.

In addition to these factors, through privatization of state-owned enterprises, the country has provided another channel to FDI; moreover, privatization signals government's commitment to economic reform.

¹ Other agreements include the Bilateral Investment and Trade policies (BITs), General Agreement on Trade in Services (GATS), and agreement on Trade –Related Measures (TRIMs). Multilateral Investment Guarantee Agency (MIGA) has also provided necessary support to cross-border investments through collaborating with the relative agents.

Much as Lesotho is obtaining significant FDI from trade privileges, the likelihood is that most of the FDI will be at stake once such privileges expire. This is because once they are withdrawn Lesotho would have to face full competition. Also, given that the country is heavily dependent on trade privileges, the competitive base for apparel, the dominant activity for FDI, remains fragile and narrow in sustaining the economy. Thus the challenge for Lesotho is to improve the base for existing foreign operations as well as to raise its attractiveness to FDI.

This paper examines the determinants of foreign direct investment in Lesotho in the light of finding how the country can attract greater FDI, diversify it and perhaps benefit more from it. Four determinants of FDI were examined, namely: market size, trade and investment initiatives, openness of the economy and political instability. Choice of these variables is in line with the existing literature on FDI such as the works of Tsikata et al (2000), Singh and Jun (1995), Asiedu (2002), Chunlai (1997) and Asante et al (2000) to mention a few.

The paper is organized as follows: in the subsequent section, we review literature on FDI. A section on trends and impact of FDI in Lesotho follows afterwards. Section 4 presents the framework for the study and regression results. Section 5 concludes the study.

2. Determinants of Foreign Direct Investment: Theoretical Foundations and Empirical Evidence

2.1 Theoretical foundations

There is an extensive literature on determinants of FDI, with different explanations of various theories that were developed in different studies. However, this literature has generated a lot of controversy due to differences in the framework for analysis. Asiedu (2002) posits that in examining the determinants of FDI, it is of crucial importance to distinguish between the two types of FDI, namely: market seeking and non-market seeking FDI.

Market-seeking FDI is defined as that FDI involving the production of goods in the host country and their sale in the local market. The main objective of this type of FDI is thus to serve domestic markets. In the case of non-market seeking FDI, goods are produced in the host country, but sold abroad. Thus, export-oriented investments necessarily imply non-market seeking FDI. Stemming from the fact that the market seeking FDI is driven by domestic demand through large markets and high incomes in the host country, FDI in small and poor countries is less likely to be market seeking.

Having distinguished between the two types of FDI, it is in order that the factors behind FDI are distinguished too. These factors can be categorized into the 'pull' and 'push' factors depending on their nature and origin. Salvatore (1990) describes the push factors as those restrictive factors in the home country of a multinational enterprise and that reduce the economic performance of such an enterprise in its home country. These factors include relatively less favourable tax structure, higher productivity costs, and less profitable production in the home country. Pull factors on the other hand, represent incentive host country policies and other privileges offered to foreign investors. A firm might invest abroad if it has ability to influence government policies and extract benefits such as tax holidays and concessions, subsidies, and trade preferences.

It is so far evident that the main pervasive theoretical issues in the body of FDI literature comprise the following:

- the reasons behind the evolution of multinational corporations,
- the driving factors behind multinational firms locating their production activities in foreign countries as opposed to exporting to other countries, and
- the factors determining the choice of host countries.

Below, we present different theoretical propositions including the influential works of Hymer (1960), Caves (1971), Vernon (1971), Dunning (1973, 1980), Balassa (1981) and Casson (1990), which have got much attention in the existing empirical works.

- Hymer (1960) proposed that in order for a multinational corporation to invest abroad, it must be in possession of some kind of firm-specific ownership advantages such as superior technology and lower cost advantage reaped from economies of scale. Since a foreign direct investor is viewed as a monopolist, monopolistic or oligopolist in product markets, he invests in foreign enterprises in order to avoid competition in his home country and to protect his market power.
- Caves (1971) provided and developed rationale for vertical and horizontal integration, where multinational corporations practice vertical integration so as to obtain control of raw material at the lowest possible cost. This involves relocation of manufacturing at intermediate (typically labour intensive) stages of production. In horizontal integration, a differentiated product that is produced abroad is also produced at home of the multinational corporation for sale in the local market.
- Vernon (1971) analyzed FDI based on the product life cycle hypothesis. According to this hypothesis, initially a product is invented in the home country of a foreign investor with comparative advantage in technology and innovatory capabilities, and produced for the home market in the home country near to both its innovators and markets. At a latter stage of the product cycle, because of a favourable combination of innovation and production advantages offered by the home country, the product is exported to other countries most similar to the home country in demand patterns and supply capabilities. Gradually, as the product becomes standardized or mature and labour becomes a more important ingredient of production costs, the attractions of relocating value-adding activities in a foreign, rather than in a domestic location increase.
- In Dunning (1971, 1983), the 'OLI paradigm' is the centerpiece in explaining motives behind FDI. The ownership, location and internalization advantages of multinational firms provide ground on which foreign firms could compete with local firms.
- Balassa (1981) explained that the changing pattern of trade between countries is due to comparative advantage, with the newly industrialized countries exporting

skill-intensive commodities and the less-developed countries exporting unskilled-labour intensive commodities. It would appear, then, that the expansion of manufactured trade between industrial and developing countries has made it possible for these countries to specialize according to their comparative advantage. This pattern of specialization has made it possible for foreign direct investments to be sited at different locations to suit the investors' targets.

- Casson (1990) sees the theory of FDI as a logical intersection of three distinct theories: *The theory of international capital markets*, which explains the financial and risk-sharing arrangements; *the theory of the firm*, which describes the location of headquarters, management, and input utilization; and *trade theory*, which describes location of production and destination of sales. In actual fact, Casson has acknowledged the need to integrate location-specific variables with internalisation variables to explain the MNC's activities.

2. Empirical evidence

The empirical evidence of FDI has been developed around the lines that FDI is by and large determined by d macroeconomic factors and political factors.

2.1 Market size

The size of host economy (market size) appears to be one of the most significant determinants of FDI in many empirical studies. As Chunlai (1997) maintains, a large market is necessary for efficient utilization of resources and exploitation of economies of scale. The logic is that as the market continues to grow, a vent is opened for provision of more opportunities needed for economic diversification and as a result, FDI start to increase thereafter. Tsikata et al (2000) see market size as the end result of different policies adopted by the government. On that basis, purchasing power, measured by gross domestic product or gross domestic product per capita, is the net effect of the overall activities within an economy. We include GDP per capita to capture the effect of the actual market size in determining FDI.

2.2 Openness of the economy

Openness of an economy not only indicates more economic linkages and activities with the rest of the world, but also indicates a more open and liberalized economic and trade regime. In particular, for those multinational firms engaging in export-oriented investments, their preference is in locating in an economy that has less trade barriers since increased imperfections that accompany trade protection generally imply higher transaction costs associated with exporting. Balassa (1983) found that the achievements of the Turkish economy in increasing exports was in response to the incentives provided under an outward oriented strategy which was part of trade reform. A similar observation was made in Ghana whereby following the Economic Recovery Program (ERP) in which trade liberalization was one of the key objectives, increased level of inward FDI were realized (Baah-Nuakoh 2000).

2.3 Political instability

In addition to trade liberalization policies, policy makers are being encouraged to improve the internal political climate because political instability tends to deter the inflow of FDI. Much as political instability is generally regarded as having a negative impact on FDI, empirical evidence has been mixed. In Akhter (2001), Garner (1993), and Schneider and Frey (1995), there is a significant negative relationship between political instability and FDI. Contrary to this finding, Bennett and Green (1972) found that the level of political instability in developing countries did not significantly affect FDI in marketing from the United States. Another example is in Jenkins and Thomas (2002) in their cross-sectional study of FDI in Southern Africa. They observed that over the past decade, Angola dominated its South African Development Community (SADC) counterparts in FDI inflows. In that meantime, Angola was undergoing severe civil unrest. This study uses a dummy variable as a proxy for political instability.

2.4 Trade and investment measures

Trade policy is a relevant factor in gearing FDI. In general, countries with more open trade regimes have done better at attracting FDI and benefiting from it than countries

with inward-oriented regimes. This is partly a reflection of the fact that more FDI is of export-seeking than classic 'tariff jumping' variety (Görg and Greenway 2001).

Foreign affiliates active in export markets can be significantly affected by the host country's trade regime. Hence, generally, trade liberalization can make a host country more conducive to export production. For export-oriented foreign affiliates, any tariff or other restriction on imported inputs affects efficiency and costs, and schemes to reduce or eliminate barriers to foreign inputs increase the attractiveness of a host country.

According to UNCTAD (1999), it has been observed that trade liberalization has been wide spread, much of this widespread owing to international investment rules e.g. GATT, GAT, TRIPS and TRIMS (see footnote 1). An early rationale given for intervention in trade was that factor markets in developing countries were obviously imperfect, and that factor prices failed to reflect the opportunity costs of various factors of production.

Vast investment incentives have been implemented globally. For example, in sub-Saharan Africa (SSA), investment promotion centers have been set up in different countries to promote industrial development and facilitate in attracting foreign direct investment. Over and above, many SSA countries have signed up agreements such as:

- *AGOA*, whose beneficiaries qualify for tariff-free exports to the United States;
- *Generalised System of Preferences*, which enables access to North America, Japan and other big export markets;
- *Lomé Convention (now Cotonou Agreement)*, which facilitates duty-free access to consumers in the European Union.

2.4 Other relevant factor in developing countries

To some extent, policies adopted by labour markets count in investors' decision to invest in a given country. Government's adoption of restrictive labour market policies might have negative effects that might spillover the macro economy in the long term. While normally designed to protect workers, regulations that make it costly to fire employees may result in lower labour demand and hold back expanding sector. A World

Bank 1997 research on India and Zimbabwe found that labour demand was depressed by the need to obtain government's permission before dismissing an employee. In such circumstances where trade reform is hampered by severe labour market regulations, firms may remain cautious about undertaking new investment because they risk being saddled with an unnecessarily large and expensive labour force.

What goes to labour in remuneration matters a lot to investors because it is a direct factor cost to them. From the supply-side of the labour market, we can draw the following stylized fact: where there is an aggregate scarcity of employment opportunities, the unemployed worker is best viewed as a victim of circumstances who would prefer even part-time work at the prevailing wage rate. An argument provided by Chunlai (1997) regarding labour cost and FDI however, was that a lower absolute wage rate might also be accompanied by lower productivity and vice-versa. Therefore, the question of labour costs and location of FDI in developing countries is quite ambiguous.

2.5 Evidence on Lesotho

Previous studies of FDI in Lesotho so far have been cross-country studies, usually employing comparative analysis using Southern African countries. Two of such studies include Jenkins and Thomas (2002), and Basu and Srinivasan (2002). In Basu and Srinivasan (2002), the main finding was that foreign direct investment in Lesotho has been driven by "specific" locational advantages. This relates to the opportunity to serve the South African market. As they rightly pointed out:

"In the late 1980's and early 1990's, investors wishing to cater to the large market in South Africa circumvented economic sanctions against the country through location of manufacturing subsidies in Lesotho."

In addition to that, they identified sound macroeconomic stance, cheap disciplined labour force, and a strong investment promotion program to be other factors enhancing Lesotho's FDI. Jenkins and Thomas' study drew on a survey conducted with predominantly European parent companies with operations in Southern Africa. Their

survey aimed to explore the following issues: motivations for investment; the market orientation of subsidiaries in Southern Africa; decisions on expansion versus contraction and implications for employment; the ownership structure of investments; the method of entry into the host economy; the impact of economic policy operations in Southern Africa; and perceptions of risk.

One of the explanations for investing in Southern Africa was found to be related to motivations for investment. Their study further identified the most important motivation for investment in Southern Africa as being the size of the local market. Most of the non-primary sector enterprises in the sample had a local market focus. They concluded that the creation of a functioning free trade area is likely to provide the economies of scale needed for profitable production, and thus should encourage more direct investment in the region.

This present study is different from the other previous studies in that, firstly, while the studies of Basu and Srinivasan (2002), and Jenkins and Thomas (2002) were cross-country studies, this particular study is country –specific. Secondly in Jenkins and Thomas (2002) the focus was only on European parent companies. Lastly, these other studies were based on survey responses, whereas in our study uses a time series analysis with the aid of a model capturing the economic and political determinants of FDI in Lesotho.

3. Trends and impact of FDI in Lesotho

3.1 FDI Trends

During the late 1960's, the Lesotho National Development Corporation was established with the view of initiating, promoting and facilitating the development of manufacturing and processing industries, mining and commerce. The period after 1970 saw relatively stable FDI inflows though at low levels. The annual average FDI inflows hardly exceeded US\$5 million owing to the fact that in those days, only a few foreign enterprises were scattered in manufacturing, services and commerce.

The FDI inflows in Lesotho continued on that modest growth path until after the IMF stabilization program of 1988. For the first time in history, Lesotho's FDI inflows rose to a peak of US\$21 million, which is far beyond what the country used to record (UNCTAD 2003). In the subsequent years, annual inflows were maintained at levels that were higher than the pre-1988 level, although they did not again reach the 1998 peak until 1994, when a surge of investment brought annual FDI inflows to US\$43 million. The explanation for this increase is in part due to the privatization sales following the sale of some of the parastatals and public enterprises. But more importantly, the increase was also led to investment in garment manufacturing. This investment in manufacturing was encouraged by Lesotho being a signatory to Lomé Convention and General System of Preferences, which as earlier mentioned, provide duty-free access to European Union, North America and other large economies.

With the remainder of the 1990s, FDI inflows maintained similarly high levels, indicating a respectable performance in terms of FDI size and growth. While FDI performance was at least satisfactory, the September 1998 political riots re-directed and destabilized the flow of FDI, partly as a result of looting and other destructions in physical property. This was witnessed by a 39 percent fall in FDI in 1999 followed by a 27 percent fall in 2000. To Lesotho's relief, the initiation of Africa Growth and Opportunity Act (AGOA) in 2000 meant positive prospects for Lesotho's FDI stance. A renewed boost to FDI has actually come with this launch of AGOA as indicated by the per annum growth of about 25 percent in manufacturing sector.

3.2 Impact of FDI in Lesotho

- **FDI and employment**

Foreign manufacturing affiliates in Lesotho have and still continue to be vital sources of employment in Lesotho. For example, according to the Labour Force Statistics (2001), around 40,000 Basotho were found to be working in the manufacturing sector. This makes up 5 percent of the labour force (800,000). This is significant in a country where unemployment prevails around 40-45 percent and the majority of the population works in agriculture and the informal sector, where the returns are generally low.

- **FDI, skills and technology transfer**

Although the export oriented FDI has been dominant in Lesotho and has largely focused on low skill and low technology activities, it is doubtless that new skills have been created and acquired by many of those who are employed by the foreign affiliates. In some cases, the employees are given prior training and in other cases, on-the-job training is provided. Lesotho's labour force is regarded as having reasonable level of literacy and basic education, but despite this, local personnel has not fully exploited the potential for senior positions. As such, many supervisory, technical and managerial jobs remain with the expatriates, even in firms that have been in Lesotho for a decade or more (UNCTAD 2003).

- **FDI and economic growth**

The benefits derived by Lesotho from FDI tend to be prevalent, especially in terms of contribution to economic growth. If FDI serves as catalyst for economic, it will stimulate development and contribute to alleviating economic growth. Recently, FDI accounts for 23 percent of GDP in Lesotho, a very significant contribution by African standards (UNCTAD 2003).

- **FDI and exports**

The contribution of foreign affiliates to total export earnings has been estimated to over three-quarters of total export earnings (Central Bank of Lesotho 2001). In particular, since 1990, manufacturing exports are reported to have increased by around two and half times. This has been explained by the fact that prior to the 1990s, most of the country's exports were destined for South Africa and the European Union, but the last decade has seen a surge in exports to the United States, having been influenced by Lesotho's new trade privileges.

4. Methodology, data and unit root tests

4.1 Method of study

The econometric method employed is the Johansen multivariate cointegration approach, which allows for modeling of the long-run relationship of non-stationary variables. That is to say that cointegration techniques are basically used to establish whether a long-run equilibrium or stationary relationship exists between non-stationary variables in a system of equations or in a single equation. Put differently, cointegration could be defined as a situation where the variables in the hypothesised relationship should not diverge from each other in the long run, or if they should diverge in the short run, this divergence must be diminishing over time.

In such relationships, it can be deduced that the dependent variable may depend not only on the level of the explanatory variables but also on the extent of disequilibrium between the levels of the explanatory variables and the dependent variable. Once a set of variables proves to be cointegrated, the error correction model (ECM) can be constructed. The appeal of the ECM is that it combines the interaction between short-term and long-term impacts in a given relationship (Gani 1999).

The Johansen approach begins by defining a general polynomial distributed lag model of a vector of variable X as an unrestricted vector auto-regression (VAR) in the level of X variables such that:

$$X_t = \Pi_1 X_{t-1} + \dots + \Pi_k X_{t-k} + e_t \quad (t=1, \dots, T) \quad (1)$$

where;

X is a vector of p variables all of which are non-stationary and Π_1, \dots, Π_k are $p \times p$ matrices of unknown parameters \mathbf{a} and $\mathbf{\beta}$. These parameters are estimated on the basis of T observations from a VAR process. The minimum lag of the system is chosen at which the residuals are white noise. Since economic time series are generally non-stationary processes, the VAR system above is usually expressed in first difference form. However, unless the difference operator is also applied to the error process and explicitly taken account of, differencing implies loss of information (Johansen and

Juselius 1990). The above VAR system is therefore re-parameterized in as error correction form as:

$$\Delta X_t = \Gamma_1 \Delta X_{t-1} + \dots + \Gamma_{k-1} \Delta X_{t-k+1} + \Pi X_{t-k} + e_t \quad (2)$$

where;

$$G_i = - (I - \alpha_1 - \dots - \alpha_i) \quad (i = 1, \dots, k) \quad (3)$$

$$\alpha_i = - (I - \alpha_1 - \dots - \alpha_k) \quad (i = 1, \dots, k-1) \quad (4)$$

In ascertaining whether the coefficient matrix $\alpha = \alpha\beta$ contains information about long run relationship between the variables, three possible cases are investigated:

Case I: Rank (α) = p, meaning that the matrix has full rank. This indicates that the vector process X_t is stationary.

Case II: Rank (α) = 0 .i.e. the matrix α is the null matrix, indicating that there are no cointegrating vectors.

Case III: $0 < \text{rank}(\alpha) = r < p$ implying that there are $p \times r$ matrices α and β .

The columns of the matrix β are the r distinct cointegrating vectors, and α is called the adjustment matrix. It represents the matrix of weights with which each cointegrating vector enters each equation of the VAR system. Johansen has developed a maximum likelihood procedure for estimating α and β as well as the likelihood ratio test for determining the value of r.

The basic model represented by equation 1 or 2 may be augmented with constant or trend in order to take into account deterministic components which may enter the model. Thus, classification of the models in the VAR system may include the following:

Model 1: No intercept or trends

Model 2: Restricted intercept and no trends

Model 3: Unrestricted intercepts and no trends

Model 4: Unrestricted intercepts and restricted trends

Model 5: Unrestricted intercepts and unrestricted trends

The issue of whether or not there are deterministic components in the VAR requires one to identify the appropriate components of the constant and trend coefficients of the overall model. This process has been discussed in Johansen and Juselius (1990), Johansen (1991 and 1994) and Osterwald-Lenum (1992).

Assuming that we specify the vector autoregressive model in the reduced form error correction model as:

$$\Delta \mathbf{X}_t = \Gamma_1 \mathbf{X}_{t-1} + \dots + \Gamma_{k-1} \Delta \mathbf{X}_{t-k+1} + \Pi \mathbf{X}_{t-k} + \mathbf{n}_0 + \mathbf{n}_1 t + \mathbf{e}_t \quad (5)$$

and that the system is cointegrated. Then the presence or absence of a deterministic term is impinged upon by the cointegration relationship.

4.2 Data

Annual data covering the period 1970-2001 were used. The data on GDP per capita, openness of the economy (ratio of exports plus imports to GDP) were obtained from various issues of the International Financial Statistics. Foreign direct investment data were extracted from the World Tables (1994 and 1995), UNCTAD Handbook of Statistics (2003) and Lesotho Bureau of Statistics.

4.3 Unit root properties of the data

The process of cointegration is preceded by investigating whether the series employed are stationary or not. In principle it is important to test for presence of unit roots since unit roots render a variable non-stationary. Unless that variable combines with other non-stationary series to form a stationary cointegration relationship, then regressions involving the series can falsely imply the existence of meaningful relationship (Harris 1995).

Some of the approaches for testing for unit roots include the Dickey-Fuller (DF) and the augmented Dickey-Fuller (ADF) both associated with Dickey and Fuller (1981), and the Phillips and Perron (1998) test. The ADF test involves running of the following regressions:

(i) Without drift and trend

$$\Delta Y_t = \mathbf{r}Y_{t-1} + \sum \mathbf{b}_i \Delta Y_{t-i} + \mathbf{e}_t$$

(ii) With drift but no trend

$$\Delta Y_t = \mathbf{a}_0 + \mathbf{r}Y_{t-1} + \sum \mathbf{b}_i \Delta Y_{t-i} + \mathbf{e}_t$$

(iii) With drift and trend

$$\Delta Y_t = \mathbf{a}_0 + \mathbf{r}Y_{t-1} + \mathbf{a}_2 t + \sum \mathbf{b}_i \Delta Y_{t-i} + \mathbf{e}_t$$

The null hypothesis tested is $\rho = 0$, acceptance of which implies non-stationarity.

The presentation in the DF test differs from the ADF above in that no lagged dependent variables are included on the right hand side. The size of the lagged terms, k , in the ADF test is set so as to produce serially uncorrelated error terms. An appropriate lag length has to be sought using the available information criteria such as the Akaike Information Criterion (AIC), the Schwartz Criterion. Validity of a chosen lag length can also be ascertained by applying normality tests on residuals from ADF regressions.

The appropriate equation for testing for unit roots in a particular series depends on the series in question. However, it has been a common practice to start with the more general specification, (iii), especially if there is indication the series exhibits a trend over a period of time. According to Gujarati (1995), data involving economic time series often tend to move in the same direction because of a trend that is common to all of them. A drawback of the ADF/DF tests is that their power is likely to be low for series where moving average terms are present or where the disturbances are heterogeneously distributed. An alternative unit root test, the Phillips and Perron (PP) test, is robust to a wide variety of serial correlation and time-dependent heteroscedasticity. Thus where there exists uncertainty regarding the dynamic structure of the time series in question, and where the random component may be non-white noise, the PP test can be superior. In tables 1 and 2, we present the results of the ADF and PP tests respectively.

Table 1: ADF Unit Root Test Results

Variable	Test Statistic (without trend)		Test Statistic (with trend)	
	Levels	First differences	Levels	First differences
LFDI	-0.8095 (1)	-6.1515* (2)	-2.8362 (3)	-5.8103* (4)
LOPEN	-3.4709 (3)	-5.2270* (4)	-3.5738 (4)	-4.4719* (1)
LGDPCAP	-3.4290 (2)	-4.0660* (2)	-3.2678 (2)	-4.1014* (2)

Notes:

0. Terms in parenthesis show the lags (k) in ADF regression.
0. k is chosen with the help of a model selection criterion such as AIC, SC and Hannan-Quinn Criterion (HQC). Normality tests on residuals from ADF regressions were performed to validate precision of the chosen lags.
0. An asterisk (*) shows rejection of null hypothesis of unit root at 5% level of significance.

Table 2: Phillips-Perron Unit Root Test Results

Variable	Critical Values			PP test Statistic
	(1%)	(5%)	(10%)	
LGDPCAP	-3.6576	-2.9591	-2.6181	-1.907585
LFDI	-3.6576	-2.9591	-2.6181	-1.248311
OPEN	-3.6576	-2.9591	-2.6181	-2.844144
DLGDPCAP	-3.6661	-2.9627*	-2.6200*	-3.486168
DLFDI	-3.6661*	-2.9627*	-2.6200*	-6.298930
DLOPEN	-3.6661*	-2.9627*	-2.6200*	-4.818220

Both the ADF and PP unit roots test results above indicate that the levels of the variables are non-stationary, but their first differences are stationary. Based on the two sets of tests, we concluded that LFDI, LGDPCAP and LOPEN are integrated of order one since they are first-difference stationary.

4.4 Model specification and regression results

We initially specify the FDI model for Lesotho as:

$$LFDI = f(LGDPCAP, LOPEN)$$

Where FDI is the log of foreign direct investment inflows, LGDPCAP is the log of GDP per capita and LOPEN is the log of openness of the economy measured by the ratio of trade to GDP.

We applied the Johansen approach to the model using PCFiml. Choice of lag length of one was set on the basis of general to specific approach, in which the model was estimated at different lag lengths and the model with the lowest information criterion was chosen. We based ourselves on the AIC and SIC to accomplish this purpose.

For determination of rank and deterministic components, namely trend and intercept, we applied the joint hypothesis test of both the rank order and deterministic components based on the Pantula principle suggested by Johansen (1992c). This method is preferred to using plots since plotting of variables to examine deterministic components may provide little information in some cases, particularly when the available data cannot account for other unmeasured factors that induce autonomous growth. The test procedure is to move through from the most restrictive model at each stage to compare the trace or maximal eigen value (λ_{\max}) statistic to its critical value and only stop the first time the null hypothesis is not rejected². The results of the joint hypothesis test based on the maximal eigen value statistic are presented below.

² Model 2 assumes no linear trends in the levels of the data, Model 3 assumes linear trends and Model 4 assumes quadratic trends in the levels of the data (Harris 1995:96).

Table 3: Results of Johansen's joint hypothesis test

$H_0: r$	$n-r$	Model 1	Model 2	Model 3
λ_{\max}				
0	3	27.91	22.34	61.6629
1	2	10.8*	11.62	29.7629
2	1	0.6357	2.827	4.5541

(*) denotes the first time the null is not rejected

The above results indicate that there is one cointegrating vector under the assumption of no linear trends in the levels of the data. We therefore carried out the long run regression analysis on the basis of one cointegrating vector, the results of which are presented below:

Table 4: Long run regression results

$\alpha_1 = 0; \alpha_2 = 0;$		
β'		
LFDI	LGDP CAP	LOPEN
1.000	-5.5669	10.139
LR test, rank = 1: $\lambda^2(2) = 0.024611 [0.8753]$		

Interpretation of the long run regression results

A typical cointegrating relationship for LFDI, LGDP CAP and LOPEN, [1, -5.5669, 10.139] reported in table 4 gives a normalized equation:

$$\text{LFDI} = 5.5669 \text{ LGDP CAP} - 10.139 \text{ LOPEN}$$

The indication from this cointegrating relation is that market size, measured by GDP per capita has a positive long-run impact on foreign direct investment. This is indicated by the reported coefficient 5.5669, which is highly elastic since is greater than one. The coefficient of LGDP CAP could also be interpreted as long-run elasticity of foreign direct investment with respect to GDP per capita. It can thus be concluded from the

results that a unit change in GDP per capita results in a more than proportionate change in FDI.

In comparison, LOPEN (a measure of openness of the economy) exhibits a negative coefficient indicating a negative long-run impact on FDI. This result is not surprising since the level of Lesotho's GDP has not been corresponding with the level of trade (X+M), hence openness of the economy expressed as the ratio of the two would definitely result in a negative impact on FDI.

Having established the vector auto regression (VAR), we proceeded with constructing the error correction model by regressing the first difference of foreign direct investment (DLFDI) on first differences of LGDPCAP and LOPEN using lag length of one. We also include one period lag of the residuals obtained from the cointegrating relationship to capture long-run information that was affected by differencing of the level variables. In addition, we included two dummies: DP for political instability, measured as 1 in successive periods of instability, 0 otherwise.

The second dummy, DIN was included to capture the implementation of investment related initiatives, thus for the period after 1990 we assign value 1 throughout, 0 otherwise. This is because it was in 1990 that following the Structural Adjustment Program and restructuring initiatives, Lesotho embarked on the foreign investment advisory service (FIAS) under the supervision of the World Bank (Riley and Benvenisti). Following FIAS project, more vents were opened that rendered Lesotho attractive in relocation of FDI. It was also within around the same time that Lesotho initiated some of the World Trade Organization (WTO) agreements and more importantly became a signatory to AGOA in 2000. For the first time in history, Lesotho was ranked amongst the best top five performers in LDCs in attracting FDI inflows UNCTAD (2002).

We then reduced the system to a parsimonious relationship by elimination of the terms that were insignificant. This is done by successive elimination of the most insignificant

term. Likelihood ratio statistic was used to arrive at the parsimonious model. The process yielded the error correction model results presented in table 6.

Table 5 Error Correction Model Results

Variable	Coefficient	Std.Error	t-value	t-prob
DLFDI_1	6.0965	2.7120	2.248	0.0345
DLGDPCAP_1	1.4761	0.81763	1.805	0.0841
DLOPEN_1	-1.3134	0.93801	-1.400	0.1748
ERT_1	-0.5083	0.2187	-2.324	0.0293
Constant	-1.0093	0.57473	-1.756	0.0924
DP	-0.3435	0.23675	-1.451	0.1602
DIN	1.1758	0.54265	2.167	0.0409

From the ECM results, we note that differenced foreign direct investment lagged to one period exerts a significant, positive impact on FDI, thus suggesting presence of short-run effect of past FDI levels on present FDI inflows. This finding is logical in that past investment climate is very important in determining FDI inflows. This also suggests that FDI in one period requires FDI in later periods, for example, to complete a project, to improve on past investment, to expand capacity etc.

The result for GDP per capita confirmed our expectation that the size of a domestic market positively affects FDI. Though not statistically significant, a t-value of 1.805 still provided a plausible support for the influence of market size on FDI.

Openness of the economy variable carries the wrong sign, but is statistically insignificant at 5 percent level. This sign may be attributed to small size of domestic GDP and large size of imports. We conclude that openness of Lesotho's economy has had very little influence on foreign direct investment.

The political instability dummy partially fulfilled our expectation. It is not statistically significant although it has the right negative sign, implying that civil unrests have influenced FDI negatively.

The results also show the significance of investment measures and incentives in attracting FDI. The dummy DIN carries the expected sign and is significant. This implies that favourable investment initiatives encourage FDI by enhancing investor confidence and also by enabling diverse export destination in some cases. This is legitimate because since most FDI in Lesotho has been in apparel exports aimed at industrial countries, this kind of FDI has been driven by trade privileges given by the EU and later United States under AGOA.

The error correction variable, ERT, is correctly signed and significant. This suggests the validity of the equilibrium relationship, indicating the existence of market forces that operate to restore long-run equilibrium after a short-run shock. Foreign direct investment adjusts by 65 percent per annum to deviation from equilibrium.

5. Conclusions and recommendations

Drawing on a time series analysis and relevant literature, the study found that Lesotho's market size, investment in the previous period, and trade and investment policies had a positive effect, but political instability and openness of the economy had a negative effect on FDI. Overall, the implementation of the liberalization process through trade and industrial agreements surged actual FDI inflows in Lesotho from negligibly low level of less than \$5 million in the 1970s and 1980s to over \$100 million in the 1990s. This can be interpreted as a sign that foreign investors have responded favourably to the recent investment incentive policies.

While the investment incentive policies have created this recent surge in foreign investments, Lesotho still suffers from facing serious challenges, as it is largely dependent on time-bound privileges (applicable in one or two markets). At the same time Lesotho has not yet been able to exploit fully long-term access to other major markets. This could suggest first and foremost that to facilitate continued increase in FDI, trade and investment policies have to correspond with initiating privileges in other sectors as well, other than manufacturing. Secondly, the incentives should focus in particular on those activities that create the strongest potential for spillovers, including

linkages between foreign and local firms, education and training. This could help strengthen the local enterprise sector both to attract more and better FDI and root existing investors more firmly on the economy.

It cannot be denied that part of the past foreign investments in Lesotho was mainly driven by global sanctions on South Africa during the apartheid era. Given the current post-apartheid situation in South Africa, the main task for those holding the reins of governance in Lesotho is to devise rigorous incentives that could curb investor-drain into South Africa. Key strategic measures could include human capital development, enhancement of competitiveness, and systematic investment promotion. All these are needed since education and skills development affects labour force trainability and productivity.

The study also found that factors fostering an atmosphere of political instability (such as social uprisings and domestic political crises) resulted in low levels of FDI particularly in those years that succeeded incidents of political instability. The future improvement to improving FDI should therefore consider nurturing a political and bureaucratic environment that will encourage foreign investment by putting an end to post-election conflicts. The government should also seek to implement political risk insurance to provide coverage to private investments.

Finally, given that openness of the economy yielded a negative relation with FDI, this could suggest that the extent of export orientation in the economy has not been large enough to reassure the investors as to the broad avenues for exportation. This is not surprising in a country with scanty resources, particularly natural resources. This reiterates the suggestion that Lesotho has to fully exploit existing FDI potential in non-manufacturing sectors such as agriculture and tourism.

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