AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

Global Trade Analysis Project
https://www.gtap.agecon.purdue.edu/

This paper is from the
GTAP Annual Conference on Global Economic Analysis
https://www.gtap.agecon.purdue.edu/events/conferences/default.asp

Determinants of Foreign Direct Investment and Economic Growth in the West African Monetary Zone: A System Equations Approach

Eli A. Udo

&

Isitua K. Obiora

University of Ibadan,

May 1, 2006

Abstract

Although the theory of diminishing returns to capital postulates that capital should be invested where its ratio to other production factors is low, evidence on the flow of Foreign Direct Investment (FDI) speaks to the contrary. Slightly more than 70 percent of world FDI in the past 20 years has gone to developed countries, where capital/labour ratio is much higher than in the developing countries. Although the literature on the FDI-growth nexus is burgeoning, this paper departs from earlier studies by specifically analyzing the candidate determinants of FDI in the West African Monetary Zone (WAMZ) and investigating the cause-effect relationship between FDI and growth. Using a simultaneous-equations method on a panel of WAMZ countries over the period 1980 to 2002, we find no evidence of a two-way causal relationship between FDI flows and economic growth. Rather FDI tends to be attracted by high per capita income, better infrastructure and political stability. Hence, any meaningful attempts at attracting FDI must take cognizance of these determinants.

Key Words: FDI, Economic Growth, WAMZ, simultaneous equation, Granger Causality.

Determinants of Foreign Direct Investment and Economic Growth in the West African Monetary Zone: A System Equations Approach

by Eli A. Udo & Isitua K. Obiora

Contents

1. Introduction

Investment in capital is an important ingredient in the growth process. Countries lacking capital accumulation and technological progress usually grow much slower than countries with high investment rate and huge research and development (R & D) expenditures. Through foreign direct investment (FDI), Multinational Corporations (MNCs) can provide countries with both capital and new technology. Indeed, some recent studies conclude that FDI has been one of the most effective means of transfering technology and knowledge (Addison et al, 2004; UNCTAD, 2003; Dunning and Hamdani, 1997).

However, most African countries exhibit features which make them unattractive to private investors, especially foreign direct investment. First, given the high dependence of these countries on exports of a few primary commodities, they are susceptible to external shocks especially terms of trade shocks. Second, their reliance on agriculture exposes them to such natural shocks, as droughts and floods, with severe adverse effect on the economy. Unquestionably, these features sum up to make the region a high-risk zone. Third, most of these countries have underdeveloped financial sector and low credit ratings. The absence of information and the prevalence of ignorance make the region vulnerable to sudden shifts in market perceptions and they are well exposed to contagion effects (Morrissey, 2003). Lastly, the persistent budget deficits emanating from a weak tax system signify severe constraints on government resources and impede government's ability to address shocks and instability. Thus, African countries seem trapped in a vicious cycle of instability, low private capital flows and poor economic performance.

The inability of most trade policy reforms and liberalization in developing countries to attract enough FDI has prompted a large body of research on the determinant of FDI flows to developing countries. An extensive literature based generally on three approaches-aggregate econometric analyses, survey appraisal of foreign investors' opinion, and econometric study at the industry level- has failed to arrive at a consensus on the determinants of FDI flows. For developing countries, the overall empirical evidence seems to suggest that although FDI may affect growth, growth itself is also a crucial determinant of FDI.[1] It becomes natural therefore to ask: will developing countries grow as a result of the contribution of FDI or should they grow first and by this means attract FDI? What essentially determine FDI flows, and the impact of FDI on macroeconomic performance of WAMZ countries? This article addresses these issues using a simultaneous-equations model on a panel of WAMZ countries over the period 1980 to 2002. We find no evidence of a two-way causal relationship between FDI flows and economic growth. Rather FDI tends to be attracted by high per capita income, economic growth, better infrastructure and political stability. Economic growth, on the other, seems to increase with greater trade openness rather than foreign direct investment inflows.

The article is organized in five sections. The following section reviews the theoretical and empirical literature. The analysis is in section 3. Section 4 discusses the major policy lessons while section 5 concludes.

[1] Graham (1995) reviews the theoretical and empirical literature on the determinants of FDI and the economic consequences for both host and source countries.

2. Theoretical foundation and Review of Prior Literature

There are several theories attempting to explain why firms engage in transnational production, which is an effect of FDI. However, there is no clear-cut theory of determinant of FDI flows, especially in developing countries. Equally, the traditional theories of development, which lay important emphasis on international trade and exchange of capital, have come under severe criticism over the years. Some of the prominent strands are presented as follows.

2.1 Theories of FDI and Transnational production

Early explanations of multinational production were based on neoclassical theories of capital movement and trade within the Heckscher-Ohlin framework. However, these theories were founded on the assumption of existence of perfect factor and goods markets and were therefore unable to provide satisfactory explanation of the nature and pattern of FDI. In the absence of market imperfections, these theories presumed that FDI would not take place. Nevertheless, the presence of risks in investing abroad implies that there must be distinct advantages to locating in a particular host country.

To fill this gap in international trade theory, Vernon (1966) has developed a product-cycle model to describe how a firm tends to become multinational at a certain stage in its growth. He argues that in the early stage of the development of a new product, production will take place in the home country for whose market the product is intended. This is because producers require continuous feedback from consumers and need good communications with their numerous suppliers. Because countries are at

different stages of economic development, new markets are available to receive new products through the demonstration effect of richer countries. At this stage, expansion into overseas markets is by means of exports. Later, when the product becomes standardized, other countries may offer comparative cost advantages so that gradually production shifts to these countries. It is possible to then export back to the country that originally invented the product. There are many examples of products that have followed this cycle. Presently, Japan and other Asian countries are major exporters of radio sets and other electronic appliances originally invented in the United States and Europe.

The product cycle hypothesis is useful on several counts. It explains the concentration of innovations in developed countries, and offers an integrated theory of international trade and FDI. Furthermore, it provides an explanation for the rapid growth in exports of manufactured goods by the newly industrialized countries. It therefore presents a useful point of departure for the study of the causes of international investment.

However, the hypothesis does not resolve the question of why MNCs opt for the use of FDI rather than to license their technology to local firms in the host (recipient) countries. This issue has been examined with reference to the theory of the firm, notably by Hymer (1976), and Dunning (1977, 1988). Hymer (1976), in a groundbreaking viewpoint on industrial organization as an incentive for FDI, focuses on the advantages that some firms enjoy. Such advantages include access to patented and generally unavailable technology, team-specific management skills, plant economies of scale, special marketing skills, possession of a brand name, and so on. Before a firm invest abroad, the potential gains from these advantages must outweigh the disadvantages of

establishing and operating in a foreign country, such as communication difficulties and ignorance of institutions, customs and tastes.

Dunning (1977, 1988), on the other hand, has proposed three conditions necessary for a firm to undertake FDI. His eclectic theory of FDI, often referred to as the OLI framework, attempts to integrate other explanations of FDI mentioned earlier. OLI stands for ownership advantages, location advantages and Internalization advantages, which are conditions that determine whether a firm, industry or country will be a source or a host of FDI (or perhaps, neither). First, a firm must have an ownership advantage. The ownership advantage is anything that gives the firm enough valuable market power to outweigh the disadvantages of doing business abroad. It could be a product or production process that other firms do not have access to, such as a patent, trade secret or blueprint. The advantage could also be intangible like a trademark or reputation for quality. Second, the foreign market must offer location advantage that makes it more profitable to produce in the foreign country than to produce at home and then export to the foreign market. Such location-specific advantages offered by a host country include access to local and regional markets, availability of comparatively cheap factors of production, competitive transportation and communications costs, the opportunity to circumvent import restrictions, and attractive investment incentives (Chery, 2001). Third, the MNC must have an internalization advantage. Precisely, internalization involves the question of why an MNC would want to exploit its assets abroad by opening or acquiring a subsidiary versus simply selling or licensing the rights to exploit those assets to a foreign firm. Though this theory has been criticized for only listing the conditions necessary for

FDI without explaining its phenomenon, it has widely contributed to international production theory.

2.2 Theories of Economic Growth and FDI

According to the standard neoclassical theories, economic growth and development is based on the utilization of land, labour and capital in production. Since developing countries in general, have underutilized land and labour and exhibit low savings rate, the marginal productivity of capital is likely to be greater in these countries. Thus, the neo-liberal theories of development assume that interdependence between the developed and the developing countries can benefit the latter. This is because capital will flow from rich to poor areas where the returns on capital investments will be highest, helping to bring about a transformation of 'backward' economies. Furthermore, the standard neo-classical theory predicts that poorer countries grow faster on average than richer countries because of diminishing returns on capital. Poor countries were expected to converge with the rich over time because of their higher capacity for absorbing capital. The reality, however, is that over the years divergence has been the case, the gap between the rich and poor economies has continued to increase. The volume of capital flow to the poor economies relative the rich has been low.

Arghiri's (1972) "Unequal Exchange" brought the whole issue of the validity of comparative advantage once again, into sharp focus. He accepts the law on its own but tries to integrate international capital and commodity flow into the law. His argument attempts to overthrow Ricardo's most fundamental assumption- international immobility of factors. He sets out to investigate how international capital flows affect Ricardo's law and endeavors to see the current form of the law in a modern world. Arghiri shows

that international capital flows negate gains for all from trade. He reasons that since wages are low in LDCs, profits will be high. If profits are re-invested, there will be rapid development and a narrowing of the gap between the rich and the poor. Hence, trade would be mutually gainful. However, with capital flows and foreign investment, this is not the case. Since foreigners face low profits in their home countries, they are willing to accept much lower rates of profit than local investors are. Hence, they invade local markets, drive down prices and siphon profits back to their countries. In the advanced countries, therefore, foreign investment leads to higher profits, higher prices and growth while in the LDCs it creates economic imperialism and stagnation. Hence, Arghiri posits that capital flows from the developed to the underdeveloped capitalist countries primarily to take advantage of the enormous difference in the cost of labour power. According to this view, unequal exchange is predicated on the basis of the dominant position enjoyed by the advanced industrial countries and the resultant dependence of the poor countries on the rich.

Other critics argue that FDI is often associated with enclave investment, sweatshop employment, income inequality and high external dependency (see Durham, 2000). All these arguments regarding the potential negative impact of FDI on growth point to the importance of certain enabling conditions to ensure that the negative effects do not outweigh the positive impacts.

At present the consensus seems to be that there is a positive association between FDI inflow and economic growth, provided the enabling environment is created. Given the fact that economic growth is strongly associated with increased productivity, FDI inflow is particularly well suited to affect economic growth positively. The main

channels through which FDI affect economic growth have been uncovered by the new growth theorists (for example, Markusen, 1995; Lemi and Asefa, 2001; Barro and Sala-I-Martin, 1995; and Borensztein, et al, 1998). Barro and Sala-I-Martin (1995) and Borensztein, et al (1998), in particular, have developed a simple endogenous growth model which demonstrates the importance of FDI in engendering growth through technological diffusion. Typically, technological diffusion via knowledge transfer and adoption of best practice across borders is arguably a key ingredient in rapid economic growth. And this can take different forms. Imported capital goods may embody improved technology. Technology licensing may allow countries to acquire innovations and expatriates may transmit knowledge. Yet, it can be argued that FDI has greatest potential as an effective means of transferring technical skills because it tends to package and integrate elements from all of the above mechanisms. First, FDI can encourage the adoption of new and improved technology in the production process through capital spillovers. Second, FDI may stimulate knowledge transfers, both in terms of manpower training and skill acquisition and by introduction of alternative management practices and better organizational arrangements.[2]

2.3 Review of Prior Studies

There is an extensive and controversial literature on factors affecting FDI flow to a host country. Grossman and Razin (1984 and 1985) show that apart from firm-specific advantages and motives to internalize externality benefits, host country's characteristics are a key determinant of MNCs location of production. In another important study, Lucas (1990) finds political risk and capital market imperfections as factors responsible

[2] The channels through which FDI may be growth enhancing are clearly identified in an excellent survey by de Mello (1997) and in Grossman and Helpman (1991, 1995), Lensink and Morrissey, 2002 and Barro and Sala-I-Martin (1995, 1997).

for the slow capital inflow to capital scarce countries. Singh and Jun (1995) empirically analyze several factors and conclude that a country's orientation toward exports is the strongest variable for explaining why a country attracts FDI.

Thomas and Worral (1994) address the effect of uncertainty through security risk in a dynamic context.[3] Their findings suggest that such risks are capable of lowering current capital inflow. For the case of developing countries, uncertainty through security risks, macroeconomic policy instability and political risks are major concerns of potential investors.[4]

Concerning research on the determinants of FDI in WAMZ, there appears to be a dearth of literature.[5] The few literature on FDI in Africa as a whole include Schoeman et al (2000) who focus on South Africa, Morrissey (2000) on Africa, Asiedu (2002) on Sub-Saharan Africa, Egwaikhide et al (2005) on the WAMZ countries. A common perception of all these studies is that FDI to Africa is driven by availability of natural resources, mainly solid minerals and crude oil. This has severe policy implications. If this is true, then FDI in the region is largely determined by an uncontrollable factor. In addition, it suggests that countries that do not have natural resources will attract very little or no FDI regardless of the policies they adopt (Asiedu, 2005). Asiedu, using a panel data for 22 countries in Sub-Saharan Africa over the period 1984-2000, shows that macroeconomic stability, efficient institutions, political stability and a good regulatory framework have a positive impact on FDI. By implication, this study has carved out a role for government.

[3] Similar studies that used different methodologies and data sets to show the impact of uncertainty on FDI include the studies by Abel (1983) Aizenman and Marion (1996), Lehmann (1999) and Huizenga (1993)
[4] The role of government policy as a determinant in attracting FDI is also addressed in Teece (1985), Mudambi (1993) and Dunning and Narula (1996).
[5] For an extensive survey on the determinants of FDI, see Gastanaga et al (1998) and Chakrabarti (2001).

Few studies using gravity model have placed special emphasis on location determinants of FDI. Chunlai (1997) using a modified gravity model found that market size, GDP growth, manufacturing efficiency wage, remoteness, stock of FDI and openness play a key role in attracting FDI. Recent studies by Nunnenkamp (2002), and Banga (2003), have corroborated his findings. From these studies, we can conclude that the determinants of FDI have not changed remarkably over time. Despite, the growing importance of education and openness, it is still the market related determinants (GDP, GDP per capita, population and GDP growth in real terms) which are most important.

In spite of the wealth of empirical literature on the positive effects of openness to trade on rapid economic growth, the literature on the effects of FDI on growth has generated a sea of contentious findings.[6] The opponents of the neo-liberal policies and globalization have focused on the exploitative nature of the multinational corporations. Prominent studies holding this view include Bornschier (1980) and Bornschier and Chase-Dunn (1985). They argue that FDI flows might have short-term beneficial effects but that the long-term effects of the accumulation of FDI stock, as a percentage of GDP, was negative on growth over time. Despite the great potential of FDI to enhance growth, monopolistic tendencies of foreign subsidiaries may crowd out domestic investment (Gardiner, 2000). Often domestic firms are incapable of successfully competing with foreign firms, which have superior marketing and advertising power and are able to engage in predatory pricing to restrict prospective entrants from gaining access to the

[6] Recent findings on openness and economic growth are less ambiguous. For instance, see studies by Levine and Renelt (1992), Baldwin and Seghezza (1996) and Dollar and Kraay (2001).

market. They conclude that the larger the proportion of the economy of an LDC in the hands of MNCs, the greater the negative externalities.[7]

However, Firebaugh (1992) has demonstrated that the findings of these earlier researchers are misleading. He has shown that the negative sign on FDI stock/GDP, holding flows constant, is due to a denominator effect of flows over stock. The larger the stock the smaller the investment rate, and vice versa. He argues that flows are positive and stock negative because smaller investment rates are related to lower economic growth – exactly as orthodox theories would predict. Firebaugh finds that foreign investment rates as well as domestic investment rates to be positively and significantly related to growth, while foreign investment has a smaller impact. He concludes that domestic investment is more effective than FDI.

While disagreeing with Firebaugh on several points, Dixon and Boswell (1996) agree that the less-good foreign capital is likely to displace the better domestic capital over time and thereby contribute towards lower economic growth in the long run. de Soysa and Oneal (1999), using recent data, find that foreign and domestic investment rates both show positive effects on growth. They also fault previous studies for concluding that foreign capital is *less good* than domestic capital based on the absolute size of the coefficients, because a percentage increase in foreign capital is not of the same magnitude in terms of dollar value compared with a percentage increase in domestic capital.

Furthermore, they find that FDI is at least three times as productive as domestic investment dollar for dollar. Using Granger causality tests they also show that foreign

[7] Other studies following this strand include; Boswell and Dixon (1990) London and Williams (1990), Wimberley and Belo (1992). These studies highlight the various transgressions of powerful MNCs in the developing world.

capital is more likely to attract domestic capital than to displace it. Other studies have collaborated these findings with different data and alternative specifications to provide convincing evidence that FDI benefits rather than hurts poor countries (Borenzstein, et al, 1998; de Mello 1997).

However, there are obvious simultaneity problems in this type of work. In a paper that specifically addresses simultaneity, Lipsey (2000) finds that trade openness is the single-most important determinant of FDI inflows, and that the ratio of FDI to GDP is the most consistent positive influence on subsequent growth rates. While not for a moment intending to contest these interesting results, further scrutiny is demanded to adequately quantify and isolate the effects of FDI inflows. The present study is meant to contribute to the literature by filling this gap using data for countries from the West African Monetary Zone (WAMZ). For most of the countries comprising the WAMZ, the experience show that the enabling environment is still in a low level of development. This condition begs the question: whatever may be the positive effect of FDI, could it be reaped without the provision of the enabling conditions? Will FDI have positive or negative effect on growth? Or, will it be neutral? Previous studies have left us with no definite answer to these questions.

3. The model and Empirical Analysis

In this section, the empirical model is specified, estimated and evaluated. The analysis of the simultaneity of the relationships requires an estimation technique that is solved simultaneously in order to capture the feedback effects. In view of these, the behavioural relationships of the model are estimated using weighted Two Stage Least Squares (WTSLS) estimation technique. This method of estimation produces results that correct

for the possible heterogeneity that may arise from the use of cross section in our panel of WAMZ countries. Annual data running from 1980 to 2002 are used for the analysis.

3.1 Model Specification

The approach adopted in this article is to construct a simple foreign investment model using the basic traditional investment model but augmented with control variables commonly used for the study of investment behaviour of multinational firms. For the growth model, the augmented neoclassical production function is used.

The general form of the traditional investment model is given by:

$$K_{it} = f(Y_{it}, R_{it}) \qquad (1)$$

i = 1,..., N and t = 1,...,T

where K_{it} is the desired capital stock, Y_{it} is output and R_{it} is real user cost of capital in a host country. The basic model refers to the traditional determinants of investment for domestic investors. As foreign firms cross boundaries, other factors become pertinent. Foreign investors are concerned about the political climate and host country government policies. These factors are important because, in most cases, the treatment received by foreign firms differ from country to country. Other macroeconomic determinants of investment, such as total and skilled labour force, market size and potential, technology, infrastructure, size of export sector, investors' confidence and image of a host country in the international business community are equally important in the location decision of foreign firms. The importance attached to each of these factors depends on the type of investment and the motivations or strategy of investors. With these modifications, we arrive at an augmented foreign investment model specification as follows.

$$FDI_{it} = \beta_{11} + \beta_{12} GDPPC_{it} + \beta_{13} GDPGR_{it} + \beta_{14} RI_{it} + \beta_{15} INF_{it} + \beta_{16} PUB_{it} + \beta_{17} DEBSR_{it} + \beta_{18} POL_{it} + \lambda_{1t} + \eta_{1i} + \varepsilon_1 \qquad (2)$$

Using an augmented Neoclassical Production function, we specify the growth equation as:

$$GDPGR_{it} = \beta_{21} + \beta_{22} LAB_{it} + \beta_{23} GDI_{it} + \beta_{24} OPEN_{it} + \beta_{25} REAL_{it} + \beta_{26} FDI_{it} + \lambda_{2t} + \eta_{2i} + \varepsilon_2 \quad (3)$$

where

FDI= Foreign Direct Investment, GDPPC= GDP per capita,GDPGR= Annual growth rate of GDP, INF= inflation rate, PUB= public investment, POL= political Stability, RI= real interest (lending rate minus inflation rate), GDI= Gross Domestic Investment, LAB= labour force, OPEN= trade openness measured as export plus import over GDP, REAL= real exchange rate overvaluation, i = 1,…5; t = 1970,…2002. β_{1j} are coefficients to be estimated. η_i is the group dummy, λ_t is the time dummy, and ε_1, ε_2 are the stochastic disturbance terms.

Equation (2) states that FDI is positive function of per capita income, the growth rate of GDP, and nominal price changes. The relationship between FDI and GDP related variables represents the market size effect; foreign firms are attracted by large aggregate demand. Public investment can have positive or negative effect on FDI depending on the nature of such investment. Public investment can be an effective tool in the creation of conducive business environment that can easily attract foreign direct investment. However, this should be cautiously handled to avoid the ugly effect of public investment crowding out private investment. So long as public investment is on the provision of social infrastructure it can promote foreign investment. But where the government is found competing with the private sector in those sectors where the private investors have comparative advantage it may be very harmful. Debt overhang effect is captured by the inclusion of the debt service ratio. This effect will be negative on FDI. Political instability and inflation rate are also expected to have a negative effect on FDI. These

variables are measures of macroeconomic uncertainty and security risk of investing in the host country.

Economic growth is specified as a positive function of labour resources, openness to trade, gross domestic investment and FDI. Exchange rate overvaluation is expected to have negative effect on growth. The channel of impact is not direct. But it is believed that an overvalued exchange rate will discourage export and lead to a deterioration of the balance of trade which directly reduces the GDP through the national income identity.

3.2 Data and Estimation technique

The interplay between macroeconomic variables such as economic growth, inflation rate and foreign direct investment is complex. Single equation methods, such as the OLS, will not adequately analyze these complex relationships. The simultaneity of the relationships requires an estimation technique that is solved simultaneously in order to capture the feedback effects. To this end, the behavioural relationships of the model were estimated using Weighted Two Stage Least Squares (WTSLS) estimation technique. Apart from eliminating the simultaneity bias, these methods of estimation produce results that correct for the possible heterogeneity that may arise from the use of cross section in our panel of WAMZ countries. For robustness, another estimation technique - the General Method of Moments (GMM) - is also used to estimate the relationships.

Annual data running from 1980 to 2002 has been used for the analysis. All the secondary data for the analysis were sourced from the World Bank *Database for Africa 2005* and *World Development Indicator 2004*. The dummy variable for political instability was constructed from information provided by Goldstone et al (2000)'s *State*

Failure Task Force Report: Phase III. The results presented below were estimated in linear form, because experimentation with the loglinear-form produced inferior results.

3.3 Empirical Results and Interpretation

Table 2 presents the empirical results of the model.

Table 2: Estimation Results (1980 – 2002)

FDI Equation		
Variable	**WTSLS**	**GMM**
	Coefficient	**Coefficient**
Constant	3.080(-0.507)	-1.425(-0.454)
GDPPC	0.024(1.794)	0.020(2.540)*
GDPGR	0.484(1.458)	0.627(3.254)*
RI	-0.014(-0.138)	-0.010(-0.144)
DEBSR	-0.492(-1.120)	-0.530(-3.944)*
INF	-0.001(-0.017)	-0.004(-0.072)
PUB	0.531(2.172)*	0.428(3.059)*
POL	-6.507(-2.360)*	-5.349(-4.244)*
Adjusted R-squared = -0.734 Durbin Watson statistic = 1.939		Adjusted R-squared = -1.049 Durbin Watson stat = 2.065
Growth Equation		
Constant	-4.644(-0.516)	-16.868(-2.184)*
LAB	0.230(0.477)	0.992(2.002)*
OPEN	0.025(0.746)	0.108(2.703)*
FDI	0.377(0.840)	0.042(0.192)
REAL	-0.001(-0.318)	-0.001(-0.227)
GDI	-0.460(-1.221)	-0.375(-1.769)
Adjusted R-squared = 0.062 Durbin Watson statistic = 1.852		Adjusted R-squared = 0.062 Durbin Watson stat = 1.852

*Numbers in bracket beside coefficients are the corresponding t-statistics. * denotes statistical significance at the 5 percent level.*

As seen from Table 2, most of the coefficients of the estimated equations have the right signs and are significant at conventional levels. From the FDI equation, we find that foreign direct investment is positively related to per capita income of the host country. This variable is statistically significant at 10 per cent level. There is also a positive correlation between foreign direct investment and the growth rate of the host country's economy. However, this variable is not a statistically significant determinant of foreign

direct investment flow to WAMZ countries. Contrary to expectation RI, the variable indicating the domestic cost of capital in the host country, is negatively related to foreign direct investment. One would have expected that the high cost of domestic capital would encourage inflow of foreign capital. However, this variable is not significant implying that the domestic cost of capital is not a key issue in the decision of foreign investors to locate in a particular host country in WAMZ. Also, external debt service has a negative effect on foreign direct investment, though it is not significant at conventional levels. The other three variables all have correct signs and are significant except for inflation rate. Inflation rate, which was included as a proxy for macroeconomic instability, has a negative effect on foreign direct investment. Uncertainty in the macroeconomic environment will obviously discourage investors from investing since it will increase the cost of investing in the host country. So will political instability, which has a negative correlation with foreign direct investment. On the other hand, public investment has a positive and significant relationship with foreign direct investment.

The economic growth equation shows that increasing labour input will increase the rate of economic growth. The other variables, namely, trade openness, foreign direct investment and real exchange overvaluation all have expected signs, except gross domestic investment, but not significant. This is an important finding. In particular, the influence of foreign direct investment is negligible. The second results generated using the GMM technique is not different from those discussed above, in terms of the signs of the estimated coefficients. However, most of the variables such as GDPGR and DEBSR in the FDI equation, and LAB and OPEN in growth equation become statistically significance at 5 percent level.

To investigate whether FDI and Growth have any predictive economic content for each other (i.e. whether any causal relationship exist between them), Granger Causality test was conducted. The results show that the two variables do not Granger-cause each other (see Appendix). In other words, in the short run, there is no two-way causal relationship between FDI and economic growth in WAMZ countries. However, in the long run, a stable relationship exists between the variables in consideration. This evidence is provided be the cointegration analysis.[8]

4. Lessons for Policy

The main policy implications of the findings can be summarized thus: first, the effect of foreign direct investment on economic growth in the WAMZ countries is negligible. This could be due to the quantity and quality of FDI attracted by these countries. In reality, the volume of FDI flowing into the zone has been very low. Without exaggeration over 80 percent of the FDI attracted by the zone has been in the oil and mineral exporting sector. The WAMZ countries seem to be latecomers to the market for FDI. Their vigorous campaigns for FDI have not yielded much fruits since FDI is still concentrated in countries with mineral resources and crude oil with no strong linkage effect on the host country economies. The per capita income in these countries is too low to effectively draw FDI into sectors that will generate positive externalities for the host countries. Second, in the case of quality, we invoke a bit of the political economy of development. An important feature of foreign direct investment to WAMZ countries has

[8] Even the cointegrating equation confirms the results from the system equations with regard to the significance of growth in the FDI equation and the insignificance of FDI in the growth equation. The cointegration results are available on request.

been the neocolonial nature of such flows. Essentially, the economies of the WAMZ countries are still structurally colonial. Most of these countries are under the protective umbrella of world capitalist powers that own investments in them and are interested in controlling its resources and trade in their (colonial master's) favour. Though politically independent and not under the political autonomy of the colonial powers, the ruling class is in conscious alliance with dominant expatriate capitalists for the exploitation of the country's resources and manpower to their mutual benefit. The economy in general, stands to gain nothing from this unpleasant alliance, which often manifest in millions of hard currencies stacked away in foreign banks. In this alliance internal policies are also used to serve the interests of expatriates and this opens to these interests an avenue for intervention in domestic affairs of the host countries. Sometimes, inter-ethnic conflicts among the elites are exploited by the expatriates firms to increase their economic gains and enjoy unparalleled monopoly (Toyo 1993).

Most African countries in general tend to be too eager to attract FDI. Citing a UNECA report, Mwilima (2003) submits that "African governments have changed from being generators of employment and spillovers for the local economy to governors of state that promote competition and search for foreign capital to fill the resource gap". One reason for this change is the wholesale internalization of neo-liberal assumptions promoted by the IMF and the World Bank. The other relates to the unpleasant alliance mentioned earlier. The ruling elites are eager to serve the interest of their colonial partner for selfish and non-patriotic reasons under the façade of pursuing national interest. Moreover, there is no evidence to show that African countries in general really benefited from the so-called technological transfer and diffusion effect. Instead, local

technological development has been curbed by competition from foreign technology and unnecessary diversion of resources to canvass for foreign investment. If countries have to compete against each other to attract the same foreign investment, they may end up dissipating all of the potential gains from such investment.

Despite this ugly picture, the countries of the WAMZ possess a bright opportunity for economic growth. From this study and others, it is obvious that countries with high rate of economic growth attract more FDI than those experiencing stagnation.[9] WAMZ countries can exploit their local resources for export. In the short run, this may contribute more to growth than depending on FDI that will be concentrated in an enclave sector without the basic spillover effects. Even if there may be positive externality from FDI, there is no justification for special incentives for FDI. In the view of Gregorio (2003), such discriminatory policies encourage rent seeking, reduce incentives for local entrepreneurship, and stimulate other forms of distortion in the economy. There is the potential crowding out, which is growth frustrating.

It is along these lines that we may agree with the opponents of the neo-liberal theories that FDI worsens the growth prospects of developing countries. Therefore, the economic growth prospects of the WAMZ countries can only depend on government's ability to embark on adequate productive projects that will improve per capita income and retained savings as the basis for domestic capital accumulation. This will empower domestic investors to compete effectively with foreign investors. Furthermore, government should create an incentive structure for the private sector. It should invest in

[9] For Sub-Saharan Africa as a whole, Bhattacharya et al (1996) identify GDP growth as a major factor determining the flow of FDI. Countries which successfully attract FDI are usually associated with high rate of GDP growth.

physical capital and infrastructure. This will be beneficial to both domestic and foreign investors.

On the external front, the analysis above suggests that debt relief will encourage FDI flow to these countries. The outstanding debt stock has been a disincentive to foreign investors. The current effort by international donor agencies through the millennium development goals (MDGs) initiative to reduce the debt burden of developing countries to sustainable levels is, therefore, a good and welcome development.

5. Conclusions

In this paper, issues on FDI and growth in WAMZ countries were raised and discussed. From the theoretical model and empirical analysis that followed, we came to the conclusion that FDI depended on the market size measured by the level of per capita income and the growth of GDP, as well as the level of uncertainty measured by political instability and macroeconomic instability or inflation. There was no evidence of any two way relationship between FDI and economic growth. However, we have found a high rate of economic growth to be an important determinant of foreign direct investment location decisions. Among other factors, public investment in infrastructural development, macroeconomic stability and political stability will encourage the flow of FDI to the region.

References

Addison, T. and G. Mavrotas (2004). "Development Financing through ODA: Trends, Financing, Gaps, Key-issues and Challenges", UNU-WIDER, paper prepared for Track II of the Helsinki Process.

Aizenman, J. and N. P. Marion (1996). "Volatility and the Investment Response", *NBER working Paper* 5841.

Arghiri, E. (1972). *Unequal Exchange: A Study of the Imperialism of Trade,* with additional comments by C. Bettelheim, New York: Monthly review press.

Asiedu, E. (2002). "On the determinants of foreign direct investment to developing countries: is Africa different?" *World Development,* vol. 30, No. 1, pp. 107-19.

Asiedu, E. (2005). "Foreign Direct Investment to Africa: The Role of Government Policy, Governance and Political Instability," *WIDER Research paper No. 2005/4.* Helsinki: UNU-WIDER.

Baldwin, R. E. and E. Seghezza (1996). "Trade-Induced Investment-led Growth", *NBER Working Paper*, 5582, Cambridge, MA: National Bureau of Economic Research.

Banga, R. (2003). "Impact of government policies and Investment Agreements on FDI inflows to Developing countries: An Empirical Evidence" *Indian Council for Research on International Economic Relations, Working Paper 116*, New Delhi, India

Barro, R. and X. Sala-I-Martin (1995) *Economic Growth,* New York: McGraw-Hill

Barro, R. and X Sala-i-Martin (1997) "Technology Diffusion, Convergence and Growth", *Journal of Economic Growth* Vol.2, 1 –26.

Borenzstein, E., J. de Gregorio and J. Lee (1998). "How does foreign direct investment affect economic growth", *Journal of International Economics*, vol. 45, pp115-135.

Bornschier, V. (1980). "Multinational Corporations and Economic Growth: A Cross-National Test of the Decapitalisation Thesis", *Journal of Development Economics*, vol.7, pp.191-210.

Bornschier, V. and C. Chase-Dunn (1985). *Transnational Corporations and Underdevelopment*, New York: Praeger.

Boswell, T. and W. Dixon (1990). "Dependency and Rebellion: A Cross-National Analysis", *American Sociological Review*, vol. 55, no.4, pp. 540-559.

Chakrabarti, A. (2001). "The Determinants of Foreign Direct Investment: Sensitivity Analyses of Cross-country Regressions," *KYKLOS*, vol. 54, pp.89-114.

Chunlai, C. (1997). "The Location Determinants of Foreign Direct Investment in Developing Countries", *CIES Discussion Paper Series 97-12*

De Gregorio, J. (2003). "The Role of Foreign Direct Investment and Natural Resources in Economic Development", *Central Bank of Chile Working Paper No. 196*, Enero.

de Mello, R. L. (1997). "Foreign Direct Investment in developing Countries and Growth: A Selective Survey", *Journal of Development Studies*, vol. 34, no. 1,pp.1-34.

de Soysa, I. and J. Oneal (1999). "Boon or Bane? Reassessing the Effects of foreign and Domestic Capital on Economic Growth", *American Sociological Review*, vol. 65, no. 5, pp. 766-782.

Dixon, W. J. and T. Boswell (1996). "Dependency, Disarticulation, and Denominator Effects: another Look at Foreign Capital Penetration", *American Journal of Sociology,* vol.102, no. 2, pp. 543-562.

Dollar, D. and A. Kraay (2000). "Growth is Good for the Poor", *Working Paper*, forthcoming. Washington, DC: Development Economics Group, World Bank, http://www.worldbank.org/research/growth/.

Dunning, J (1977). "Trade, Location of Economic Activity and the MNE: A Search for an Eclectic Approach", in Ohlin et al. (eds) (1977)

Dunning, J. (1988). *Explaining International production,* Unwin Hyman.

Dunning, J. H. and K. A. Hamdani (1997). *The New Globalism and Developing Countries*, Tokyo and New York: United Nations University Press.

Dunning, J. H. and R. Narula (1996). "The investment development path revisited", in Dunning, J. H. and R. Narula (ed.) *Foreign Direct Investment and Governments: Catalysts for Economic Restructuring,* Routledge studies in International Business and the World Economy, Routledge.

Egwaikhide, F. O., E. Udo, I. K. Obiora and E. K. Ogunleye (2005). "Foreign Direct Investment in the West African Monetary Zone: An Assessment of Flows, Volatility and Growth", *West African Journal of Monetary and Economic Integration,* vol. 5, no. 2(a), pp. 137-150.

Firebaugh, G. (1992). "Growth Effects of Foreign and Domestic Investment", *American Journal of Sociology*, vol. 98, no.1, pp.105-130.

Gardiner, R. (2000). "Foreign Direct Investment: A Lead Driver for Sustainable Development?" *Towards Earth Summit 2002*, Economic Briefing Series No.1.

Gastanaga, V., J. B. Nugent and B Pashamova (1998). "Host Country Reforms and FDI Inflows: How Much Difference Do They Make?" World Development, vol. 26, no. 7, pp. 1299-1314.

Goldstone, J. A. et al (2000). *State Failure Task Force Report: Phase III Findings,* McLean, Virginia: Science Applications International Corporation (SAIC), September 30.

Graham, E. H. (1995). "Foreign Direct Investment in the World Economy". *IMF Working Paper WP/95/59.* Washington, D.C.: International Monetary Fund.

Grossman, G. and E. Helpman (1991). *Innovation and Growth in the Global* Economy.Cambridge: MIT Press.

Grossman, H.and E. Helpman (1995). Technology and Trade. In: Grossman, G.M. and K. Rogoff, (Eds.). *Handbook of International Economics,* vol. 3 New York: North-Holland,

Grossman, G. M. and A. Razin (1984). "International Capital Movements under Uncertainty", The Journal of Political Economy, vol. 92, Issue 2, pp. 286-306.

Grossman, G. M. and A. Razin (1985). "Direct Foreign Investment and The Choice of Technique Under Uncertainty", *Oxford Economic Papers*, vol. 37, pp.606-620.

Huizenga, J. (1993). "Inflation uncertainty, and Investment in U.S. Manufacturing", *Journal of Money, Credit and Banking*, vol. 25, Issue 3.

Hymer, S H (1976). *The International Operations of National Firms: a Study of Direct Foreign Investment*, MIT monographs in Economics; 14, MIT Press, Cambridge, Mass.

Lehmann, A. (1999). "Country Risks and the Investment Activity of U.S. Multinationals in Developing Countries", *IMF working Paper* 133.

Lemi, A. and S. Asefa (2001), "Foreign Direct Investment and Uncertainty: Empirical Evidence from Africa," Paper prepared for the *Allied Social Association Annual meeting* held at Atlanta, GA January 4-6, 2002

Lensink, R. and O. Morrissey (2001) " FDI Flows, Volatility and Growth" University of Nottingham: *CREDIT Research Paper 01/06*.

Lensink, R. and O. Morrissey (2002), "The Volatility of FDI, Not the Level, Affects Growth in Developing Countries," A paper prepared for the *30th Annual Conference of Economists*, 23-26 September, 2001, University of Western Australia, Perth.

Levine, R. and D. Renelt (1992). "A Sensitivity Analysis of Cross-Country Growth Regressions", *American Economic Review*, vol. 82, no.4, pp.942-963.
London and Williams 1990

Lipsey, R. (2000). "Inward FDI and Economic growth in developing countries", *Transnational Corporations,* vol. 9, no.1, pp.66-95.

Lucas, R. (1990). "Why Doesn't Capital Flow from Rich to Poor Countries?", *American Economic Review*, vol. 80, no.2.

Markusen, J.R. (1995) "The Boundaries of Multinational Enterprises and the Theory of International Trade" *Journal of Economic Perspectives,* Vol. 9, 169-189.

Morrissey, O. (2003). "Finance for Development: Enhancing the Role of Private Finance", Development Report 2003, Globalization and Poverty, http://www.gapresearch.org/finance/.

Morrissey, P. (2000). "Foreign Direct Investment to Africa: Policies also Matter" *Transnational Corporation,* vol. 9, no. 2, pp.107-125.

Mudambi, R. (1993). "Government Policy toward MNEs in the Presence of Foreign Exchange Scarcity", *Eastern Economic Journal*, vol. 19, no.1.

Mwilima, N. (2003). "Characteristics, Extent and Impact of Foreign Direct Investment on African local Economic Development," Labour Resource and Research Institute (LaRRI), Windhoek, Namibia. December.

Nunnenkamp, P. (2002). *Determinants of FDI in developing countries: has globalization changed the rules of the game?* Kieler Arbeitspapiere, Kiel working papers; no. 1122, Kiel Institute for World Economics, Kiel.

Schoeman, N. J., Z. C. Robinson and T. J. de Wet (2000). "Foreign Direct Investment Flows and Fiscal Discipline in south Africa," *South African Journal of Economic and Management Sciences*, vol. 3,no. 2, pp. 235-244

Singh, H. and K. W. Jun(1995) "New Evidence on determinants of FDI in developing countries", *Policy Research Working Paper No1531*. Washington, D.C.; The World Bank.

Soderstein, B. and Reed, G. (1994). *International Economics.* London: Macmillan Press.

Teece, D. J. (1985). "Multinational Enterprise, Internal Governance, and Industrial Organization", *AEA Papers and Proceedings.*

Thomas, J. and T. Worral (1994). "Foreign Direct Investment and the Risk of Expropriation", *Review of Economic Studies*, vol. 61.

Toyo, E. (1993). "Conceptual issues in the National Question", In: *The National Question and Economic Development in Nigeria*. Proceedings of the 1993 Annual Conference of the Nigerian Economic Society.

UNCTAD (2000). *World Investment Report: Cross-border Mergers and Acquisitions and Development,* New York: United Nations.

UNCTAD (2003). *Trade and Development Report, 2003: Capital Accumulation, Growth and Structural Change*, New York: United Nations.

Vernon, R. (1966). "International Investment and International Trade in the Product Cycle", *Quarterly Journal of Economics*, vol.80, pp.190-207.

Wimberley, D. W. and W. Belo (1992). "Effects of Foreign Investment, Exports and Economic Growth on Third World Food Consumption", *Social Forces*, vol. 70, no. 4, pp.895-921.

Appendix

1. Results of the Pairwise Granger Causality Tests

Nigeria

Pairwise Granger Causality Tests
Date: 04/28/06 Time: 13:17
Sample: 1980 2002
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
GDPGR does not Granger Cause FDI	23	0.25355	0.77877
FDI does not Granger Cause GDPGR		1.46432	0.25750

Pairwise Granger Causality Tests
Sample: 1970 2002

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
GDPGR does not Granger Cause FDI	31	0.09997	0.90521
FDI does not Granger Cause GDPGR		1.15305	0.33129

Sierra Leone

Pairwise Granger Causality Tests
Sample: 1970 2002
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
GDPGR does not Granger Cause FDI	31	0.67583	0.51745
FDI does not Granger Cause GDPGR		0.98134	0.38827

Pairwise Granger Causality Tests
Sample: 1980 2002
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
GDPGR does not Granger Cause FDI	23	0.49453	0.61791
FDI does not Granger Cause GDPGR		0.84980	0.44395

Ghana

Pairwise Granger Causality Tests
Sample: 1970 2002
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Probability
GDPGR does not Granger Cause FDI	32	3.74616	0.06273
FDI does not Granger Cause GDPGR		0.15197	0.69950

Pairwise Granger Causality Tests
Sample: 1980 2002
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Probability
GDPGR does not Granger Cause FDI	23	0.71103	0.40907
FDI does not Granger Cause GDPGR		0.00019	0.98907

The Gambia

Pairwise Granger Causality Tests
Sample: 1980 2002
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Probability
GDPGR does not Granger Cause FDI	23	1.73079	0.20319
FDI does not Granger Cause GDPGR		0.08871	0.76889

Pairwise Granger Causality Tests
Sample: 1970 2002
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Probability
GDPGR does not Granger Cause FDI	32	1.24900	0.27292
FDI does not Granger Cause GDPGR		0.02300	0.88050

Guinea

Pairwise Granger Causality Tests
Sample: 1987 2002
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
GDPGR does not Granger Cause FDI	14	0.74698	0.50103
FDI does not Granger Cause GDPGR		2.53747	0.13368

Raw estimation results

System: FDIGROTH
Estimation Method: Weighted Two-Stage Least Squares
Date: 04/28/06 Time: 10:19
Sample: 1981 2002
Included observations: 67
Total system (unbalanced) observations 132
Linear estimation after one-step weighting matrix

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1.508129	5.347321	-0.282035	0.7784
C(2)	0.020889	0.012131	1.722045	0.0877
C(3)	0.536643	0.330860	1.621963	0.1075
C(4)	-0.004947	0.108659	-0.045529	0.9638
C(5)	-0.631936	0.339961	-1.858847	0.0655
C(7)	-0.001781	0.067918	-0.026222	0.9791
C(8)	0.529709	0.258734	2.047310	0.0428
C(10)	-5.811361	2.450011	-2.371974	0.0193
C(11)	-22.40902	15.89990	-1.409380	0.1614
C(12)	1.341220	0.970622	1.381815	0.1696
C(14)	0.128342	0.085747	1.496744	0.1371
C(16)	-0.024435	0.521332	-0.046871	0.9627
C(18)	-0.000416	0.002987	-0.139391	0.8894
C(19)	-0.460167	0.376779	-1.221317	0.2244
Determinant residual covariance		300.1899		

Equation: FDI = C(1) + C(2)*GDPPC + C(3)*GDPGR + C(4)*RI + C(5)
*DEBSR + C(7)*INF + C(8)*PUB + C(10)*POL

Instruments: FDI(-1) GDPPC(-1) GDP(-1) GDPGR(-1) GDI(-1) DEBSR(
-1) INF(-1) TB(-1) REAL(-1) PUB(-1) LAB(-1) RI(-1) OPEN(-1) C
Observations: 65

R-squared	-0.730651	Mean dependent var	2.243874
Adjusted R-squared	-0.943187	S.D. dependent var	3.017570
S.E. of regression	4.206440	Sum squared resid	1008.566
Durbin-Watson stat	2.009089		

Equation: GDPGR = C(11) + C(12)*LNLAB + C(14)*OPEN + C(16)
*FDI + C(18)*REAL + C(19)*GDI
Instruments: FDI(-1) GDPPC(-1) GDP(-1) GDPGR(-1) GDI(-1) DEBSR(
-1) INF(-1) TB(-1) REAL(-1) PUB(-1) LAB(-1) RI(-1) OPEN(-1) C
Observations: 67

R-squared	0.122000	Mean dependent var	1.491623
Adjusted R-squared	0.050033	S.D. dependent var	5.779102
S.E. of regression	5.632674	Sum squared resid	1935.348
Durbin-Watson stat	1.878160		

System: FDIGROTH
Estimation Method: Generalized Method of Moments
Date: 04/28/06 Time: 10:26
Sample: 1981 2002
Included observations: 67
Total system (unbalanced) observations 132
Kernel: Bartlett, Bandwidth: Fixed (3), No prewhitening
Linear estimation after one-step weighting matrix

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1.424715	3.135972	-0.454314	0.6504
C(2)	0.020318	0.007998	2.540469	0.0124
C(3)	0.627115	0.192741	3.253665	0.0015
C(4)	-0.010495	0.072813	-0.144133	0.8856
C(5)	-0.530327	0.134469	-3.943876	0.0001
C(7)	-0.003571	0.049366	-0.072332	0.9425
C(8)	0.428351	0.140014	3.059337	0.0027
C(10)	-5.349193	1.260438	-4.243916	0.0000
C(11)	-16.86875	7.724351	-2.183841	0.0310
C(12)	0.991801	0.495310	2.002385	0.0475
C(14)	0.107998	0.039951	2.703286	0.0079
C(16)	0.042168	0.219424	0.192176	0.8479
C(18)	-0.000515	0.002268	-0.227062	0.8208
C(19)	-0.372792	0.210723	-1.769108	0.0795

Determinant residual covariance	242.4859
J-statistic	0.192851

Equation: FDI = C(1) + C(2)*GDPPC + C(3)*GDPGR + C(4)*RI + C(5)
*DEBSR + C(7)*INF + C(8)*PUB + C(10)*POL
Instruments: FDI(-1) GDPPC(-1) GDP(-1) GDPGR(-1) GDI(-1) DEBSR(
-1) INF(-1) TB(-1) REAL(-1) PUB(-1) LAB(-1) RI(-1) OPEN(-1) C
Observations: 65

R-squared	-0.824495	Mean dependent var	2.243874
Adjusted R-squared	-1.048556	S.D. dependent var	3.017570
S.E. of regression	4.318981	Sum squared resid	1063.255
Durbin-Watson stat	2.065125		

Equation: GDPGR = C(11) + C(12)*LNLAB + C(14)*OPEN + C(16)
*FDI + C(18)*REAL + C(19)*GDI
Instruments: FDI(-1) GDPPC(-1) GDP(-1) GDPGR(-1) GDI(-1) DEBSR(
-1) INF(-1) TB(-1) REAL(-1) PUB(-1) LAB(-1) RI(-1) OPEN(-1) C
Observations: 67

R-squared	0.128966	Mean dependent var	1.491623
Adjusted R-squared	0.057570	S.D. dependent var	5.779102
S.E. of regression	5.610286	Sum squared resid	1919.994
Durbin-Watson stat	1.873031		