

The relationship between Investment and economic growth in Developing Countries: A Case in Ghana

Duke Darko

Breyer State University London Centre, UK

Abstract

This paper uses simple regression analysis for a time series data between 1981 and 2000 to assess the relationship between FDI and economic growth in Ghana. The general thought of the paper is that FDI does not result in or indicate a robust positive influence on economic growth for the period under consideration: 1981-2000.

Introduction

This project offers an empirical evaluation on the extent to which FDI or its determinants impacts on economic growth in Ghana. Developing countries in their quest for growth introduce measures to enable them acquire FDI to supplement current local resources, for example savings.

FDI as a source of capital is very vital to a developing country's bid to close up the financing gap between scarce foreign investment and inadequate local resources. Henandez and Rodolph (1995) explain the movement of private capital flow for a panel of 22 high and low recipient countries between 1986 and 1993 using a stock adjustment model. The results indicate the importance of domestic factors as a determinant of increase of private capital to recipient countries and their relationship with economic growth.

Investment trends in Ghana

In more recent years - the 1970's, FDI was mainly in import substitution manufacturing. Annual inflows were as high as \$68million for about 2 years in the late 1970's and hovering at under \$5million in the mid-1980's. With the introduction of the Economic Recovery Programme (ERP) / The Structural Adjustment Programme (SAP) in 1983, Ghana undertook a relatively successful transition from an administrative system of economic management to a market economy.¹ In 1986, Ghana saw an increase in FDI which was triggered by the adoption of policies to attract investment in natural resources. There was a great investor respond due to the new enacted mining laws in 1986 causing a surge of investment similar to a mini 'gold rush'. The divestiture programme also

¹ GFCF as a % of GDP rose from 5.2% in 1978-1983 to 10.8% in 1984-1990. Aryeetey, E., et al., 2000, Economic Reforms in Ghana.

attracted FDI. However there was a slow start in the divestiture programme (privatisation).²

In 2000, FDI inflow in Ghana recovered. New policies which were introduced by the new government which took over in 2001 have helped stabilise the economy.³ The impact of FDI in Ghana has not been widely felt except in the particular sectors of the economy such as selected areas of capital formation, employment generation and transfer of technology and skills.

The basic problem with export oriented investment is that FDI is not spread evenly throughout the country, that is, it is concentrated only in the Greater-Accra Region and the Ashanti Region. Generally, the impact of FDI has best been seen in terms of its contribution to growth and improvement of service to the Ghanaian economy.

In 1986, Ghana saw an increase in FDI which was triggered by the adoption of policies to attract investment in natural resources. There was a great investor respond due to the new enacted mining laws in 1986 causing a surge of investment similar to a mini 'gold rush'. The divestiture programme also attracted FDI. However there was a slow start in the divestiture programme (privatisation).⁴ The most recent peak of FDI inflow was registered in 1996 when Telecom Malaysia bought 30% of the share of the state owned Ghana Telecom. To further attract FDI, an investment code was enacted in 1994, within the framework of a comprehensive development strategy-VISION 2020. The aim was to attract export-oriented firms to start export led growth as well as facilitate trade by removing the constraints to the development of exports and investments.⁵ In 2000, FDI inflow in Ghana recovered. In addition, major efforts are being made to see that recent improvements in living standards in Accra and Ashanti industrial regions will also be felt in other much poorer regions and other sectors of the economy.⁶

FDI and capital formation

External source of capital has been very important in the economic development of Ghana; however, the share of FDI in the inflows of external source of capital has been very small. According to the World Bank African Development Indicators 2002, there has been a considerable gap between savings and investments: In 1980-1999, domestic savings as a proportion of GDP was about 6% compared to an average of 16% for the sub-Saharan Africa; while domestic investment as a proportion of GDP was 13.9% compared to an average of 19.1% in the Sub-Saharan Africa. This saving investment gap has been closed up by the inflows of external capital.

Literature review

² Source UNCTAD FDI, TNC Data base.

³ Republic of Ghana 'Ghana Poverty Reduction Strategy' Progress Report 2002.

⁴ Source UNCTAD FDI, TNC Data base.

⁵ Source :World bank (1998), press release no. 99/1874/AFR

⁶ Republic of Ghana 'Ghana Poverty Reduction Strategy' Progress Report 2002.

According to Borensztein et al. (1998:115), FDI is an important vehicle for the transfer of technology, contributing relatively more to growth than domestic investment. However, the higher productivity of FDI is realized only when the host country has a minimum threshold stock of human capital. In other words, FDI contributes to economic growth only when sufficient absorptive capacity of advanced technologies is available in the host economy. Besides these channels, Foreign Direct Investment by Multinational Corporations (MNCs) is considered to be a major channel for access to advanced technology by developing countries. In other words, FDI contribution to economic growth is enhanced by its interaction with the level of human capital in the host country.

Borensztein et al. (1998:117) also investigate the effect of FDI on domestic investment in order to demonstrate whether there is evidence that foreign capital inflow 'crowds out' domestic investment. The outcome is in support of the crowding-in effect: a one-dollar inflow of FDI is associated with an increase in total investment in the host economy of more than one dollar. Thus, it seems to be the case that the principal channel through which FDI contributes to economic growth is by stimulating technological progress, rather than by increasing total capital accumulation in the host economy.

According to Ramachandran (1993:666), there are two channels of transferring technology. These are through Foreign Direct Investment via equity ownership and direct licensing to firms that are wholly Indian-owned.

A country's macroeconomic policies would affect its growth performance through their impact on certain economic variables.⁷ Oriented trade policies are conducive to foster growth when they promote competition, encourage learning-by-doing, improve access to trade opportunities and raise the efficiency of resource allocation. The estimated growth equation indicates that per capita real GDP growth is positively influenced by economic policies that raise the ratio of private investment to GDP, and that promotes human capital development.

Coe et al. (1998:6) find a relationship between the measures of export orientation (trade openness) and income growth. The outcome indicates a positive relationship between the two. Most theoretical literature emphasizes the endogenous nature of innovation and the importance of externalities and technological spill overs, and highlights FDI as a vehicle whereby less-developed countries could catch up with the more-advanced countries.

Beddies (1999:13-27) uses the neoclassical growth theory to emphasise that technical change is exogenous and the same technical opportunities are available within countries. This assumption implies that steady growth rate solely depends on exogenous population growth and exogenous technical progress. Given the properties of capital, that is that its marginal product decreases as a country accumulates it, the neoclassical model predicts that poor countries should gradually converge towards richer countries.

⁷ High rate of inflation which is generally harmful to growth because it raises the cost of borrowing and thus lowers the rate of capital investment. Low or single digit levels of inflation exhibits the trade off between inflation and growth can be minimal.

Zhang (2004) investigates whether trade openness increases a country's income per person. Zhang sought to identify the separate influence of export openness and import openness on income levels. For the outcome, openness correlates much more closely and strongly with a country's living standards cross-sectionally than does import openness. Particularly, there is a positive correlation between export openness and income levels. Import openness correlates negatively with countries' incomes.

Nahuis et al. (2000) examine the link between Research and Development (R&D) and trade related knowledge spillovers and growth, especially as they relate to changing specialization and import patterns. Although R&D increases the benefits from trade liberalization, the effects are region and specific based.

McPherson et al. (2001) examine the interaction between trade and growth for 33 African countries between 1970 and 1998. For the outcome, the effect of trade and growth on trade is direct, with a possible time lag, and an indirect impact between trade and growth. The latter is channelled via changes in the exchange rate, inflation, and the real exchange rate.

Marrotas et al. (2003) examine specifically the causal relationship between FDI and economic growth for Chile. For the outcome, it is GDP that causes FDI to grow, not vice versa. For Malaysia and Thailand, there is a strong evidence of a "bi-directional causality" between GDP and FDI.

Damijan et al. (2003) explore the importance of different channels of technology transfer (spill over) through FDI and its impact on productivity growth of local firms for 10 transition economies. For the outcome, direct FDI effects are significant in about 50% of examined transition economies. Second, that FDI effects are the most important productivity spill over for local firms. Third, that the direct effects on FDI provide on average an effect on firms' productivity that is over some factor 50 than the impact of 'backward linkages' and over 500 larger than the impact of 'horizontal linkages'. In effect, vertical spill over from FDI are greater than horizontal spill over.

Bloomstrom et al. (1996) seek to find out the link between fixed investment (equipment investment) and economic growth. In their view, raising saving and investment from say 5 to 15% does not necessarily generate growth of an expected magnitude. For the various institutions: economic/political, inflows of direct investment as well as the efficient use of investment tend to be the main foundations for economic growth.

Arestis et al. (1997) examine the empirical evidence concerning the link between financial development and economic growth. An outcome is that moderate 'financial repression' at positive interest rates could have boosted aggregate investment and growth in High Asian Performing Economies by transferring income from depositors, especially households to borrowers, primarily firms. This is not the case, as exemplified by South Korea.

In investigating why the income of the poor rises one-for-one with overall growth, Dollar et al. (2000) assert that openness to foreign trade benefits the poor to the same

extent that it benefits the economy. Further, that there is no evidence that public spending on health and education have systematic effects on incomes of the poor.

According to Mankiw et al. (1992), the accumulation of physical capital has a larger impact on income per capita. A higher savings rate leads to higher income in steady states, which in turn leads to a higher level of human capital even if the rate of human capital accumulation is unchanged.

Methodology

The method of investigation would be mainly quantitative. A simple regression analysis would be used. The purpose of the empirical investigation is to estimate the effects of FDI on growth and to investigate the channel through which FDI may be beneficial for growth via its effect on the variables that determine growth. The regression analyses are based on secondary data for the period 1981- 2000. The intention is to investigate the effects of FDI on economic growth and to determine whether the effect of FDI on economic growth is significant using simple regression analysis. All data for the analysis is from Heston et al. (2006).

Analysis of data

Regression analysis and various graphs have been used to analyse the data concerning the various variables of interest for instance, INVEST, OPEN and EG.

From chart 1, the graph of investment against inflation is showing the regression indicates that a 100 % increase in inflation would decrease investment by 0.22 percent (not even 1%). The indication is that for Ghana a unit increase in inflation results on average in investment falling. However, the fall in investment as a result of the increase in inflation is not very pronounced. It seems to be the case that inflation has not got much impact on investment. The Economic Recovery Programme that commenced in 1983 decreased inflation from 120 % to a single digit figure by 1990. With this drastic cut in inflation, the expectation was that inflation was not likely to serve as a disincentive to investment, and therefore the investment inflation relationship is quite expected. The coefficient of determination is 0.013. On average 10% of the change in investment is caused by movement in the inflation variable. Indicatively, between 1981 and 2000 investment was not that sensitive to inflation.

Chart 2 presents invest against exchange rate relationship. From the output (in excel) $\text{Investment} = 2 \times 10^{-5} * (\text{Exchange rate}) + 5.9425$; $0.00002 * (\text{Exchange rate}) + 5.9425$. If exchange rate were to fall by 100,000 percentage points, investment would increase by 2 percentage points. In effect, investment was not sensitive to change in the exchange rate path. The indication is that exchange rate as a tool could not be used to significantly induce or increase investment. The coefficient of determination is 0.0015. On average 0.15% of the average movements in the investment variable is accounted for by movements in the exchange rate variable. The general thought of the output of chart 2, as indicated by the regression equation and the coefficient of determination is that the investment virtually does not respond in the changes in exchange rate- increasing or decreasing the exchange rate.

From Chart 3 INVEST against TBAL is presented. There is a negative relationship between investment and trade balance. If trade balance were to increase by 1 unit, investment would fall by 0.0007 units. It seems to be the case that investment is generally insensitive to changes in TBAL. And given that TBAL is the difference between exports and imports, then a widening trade balance (excess of exports over imports) would not increase investment, but rather decrease investment. The coefficient of determination is 8.34%; on average 8.34% of the movements in investment is attributed to changes in trade balance increases (a very low explanatory power). A decreasing trade balance could provide the basis for a government to attract investors through measures such as tax free holidays and for export free incentive schemes to increase FDI. However, Ghana seems to indicate the opposite for the situation under consideration: 1981-2000.

Chart 4 illustrates a positive relationship between INVEST and PDVTY. From the outcome a unit increase in productivity results in a 0.0018 unit increase in investment. If productivity were to increase by 100 percentage points, investment would increase by 0.18 percentage point. An increment in the productivity factor by 1 unit US dollar would increase investment. However, the percentage increase in investment would only be 0.18%. Investment is thus inelastic to changes in productivity. Increasing productivity does not seem to indicate an increase in investment. An indication is that in Ghana's case, most of the state enterprises were performing under 30% capacity prior to 1981. And with new capital equipment and technology transfer via investment or FDI, the impact of technology acquisition and application and utilisation would not be that fast as to increase investment and hence economic growth. This might be because of the long gestation period of primary commodities, for example cocoa.

From Table 1, XRATE, INFLATE, EXPORT, TBAL, OPEN, INVEST, PDVTY are the independent variables. The dependant variable is EG. Only PDVTY is statistically significant, as its p-value is less than 0.05 (0.0316). For all the variables acting in combination, their F value is greater than 0.05 (0.11), indicating that the F value is statistically insignificant. In respect of the individual variables, only PDVTY has a statistically significant effect on EG.

From Table 2, some variables are dropped, leaving INVEST and PDVTY. Again, in this regression, only PDVTY has a statistically significant effect on EG as its P value (0.011) is less than 0.05. For both INVEST and PDVTY acting together they have a statistically significant effect on EG as its P value (0.029) is less than 0.05.

Evaluation

What is clear, however, is that PDVTY is making a significant positive impact in all the regressions.⁸ The results indicate that the higher productivity of FDI (independently statistically significant and positive in this case) holds only when the host country has a minimum stock human capital in line with Borensztein et al. (1998). One variable, acting alone which seems to impact positively on EG is PDVTY.

Conclusion and recommendations

⁸ All regressions run are available on request from the author

Specifically, the paper sought to investigate whether or not FDI (or its determinants acting individually or in combination) increases EG in Ghana. The results are mixed: the study provides mixed support for various assertions. However, one thing is quite clear. PDVTY acting alone has a statistically significant effect on EG in all the regressions run.

A more favourable way, given more time is to sort out the data into say three sub-years (phases): 1981-1988, 1988-1995 and 1995-2000. This would enable a more detailed analysis of FDI and the macroeconomic variables of interest to be examined within the context of the various phases of Ghana's Economic Recovery Programme: "phase 1", "phase two" and "phase three". In further studies, it would be most useful to investigate the productivity further. Specifically, the extent to which capital and labour each contribute to productivity may be of interest. In other words, the relative share of capital and labour to production in the economy is vital. To make the analyses quite complete, the share of technology in a given production function appropriate to the economy could be considered, for example, using the Cobb Douglass Production Function. In doing so, an aspect of the analysis would consider the variables "openness" and "human capital" accumulation via productivity factor and how they promote economic growth

The outcome of this paper should not be seen as to indicate that FDI is not important for long-term growth. In Borensztein et al. (1998), there are specified cases in which FDI positively links with long-run growth. And as emphasised by Henry (2000), openness may be crucial for economic success.

According to Townsend (1979), the relationship between FDI and economic growth remains unclear. Several studies find a clear positive link while others do not. Research focus on data from LDC has tended to find a clear positive relationship, while studies that have ignored this distinction or have focus on data from developed countries have found no growth benefit for the recipient country.

The aim of the study is to investigate the relation between FDI and economic growth in Ghana between 1981 and 2000. The result of this analysis indicates that FDI (or the factors that affect FDI) does not have a clear statistical and significant effect on economic growth.

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Appendix: Tables and Charts

Table 1: Regression results

Dependent variable is EG: Economic growth (growth)

Summary output

<i>Regression Statistics</i>	
Multiple R	0.749
R Square	0.561
Adjusted R Square	0.305
Standard Error	2.826
Observations	20.000

ANOVA

	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	7.000	122.537	17.505	2.193	0.111
Residual	12.000	95.808	7.984		
Total	19.000	218.345			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-50.497	24.999	-2.020	0.066	-104.965	3.970	-104.965	3.970
XRATE	0.002	0.001	1.239	0.239	-0.001	0.004	-0.001	0.004
INFLATE	-0.010	0.008	-1.387	0.191	-0.027	0.006	-0.027	0.006
EXPORT	0.000	0.000	-1.431	0.178	-1.385	0.000	0.000	0.000
TBAL	0.001	0.005	0.111	0.913	-0.011	0.012	-0.011	0.012
OPEN	0.085	0.169	0.501	0.625	-0.284	0.453	-0.284	0.453
INVEST	-0.830	1.006	-0.824	0.426	-3.022	1.363	-3.022	1.363
PDVTY	0.040	0.016	2.431	0.032	0.004	0.075	0.004	0.075

Source: Heston, A., Summers, R., and Aten, B., 2006

Table 2: Dependent variable is EG: Economic growth

Summary output

Regression Statistics

Multiple R 0.585

R Square	0.342
Adjusted R Square	0.265
Standard Error	2.907
Observations	20.000

ANOVA

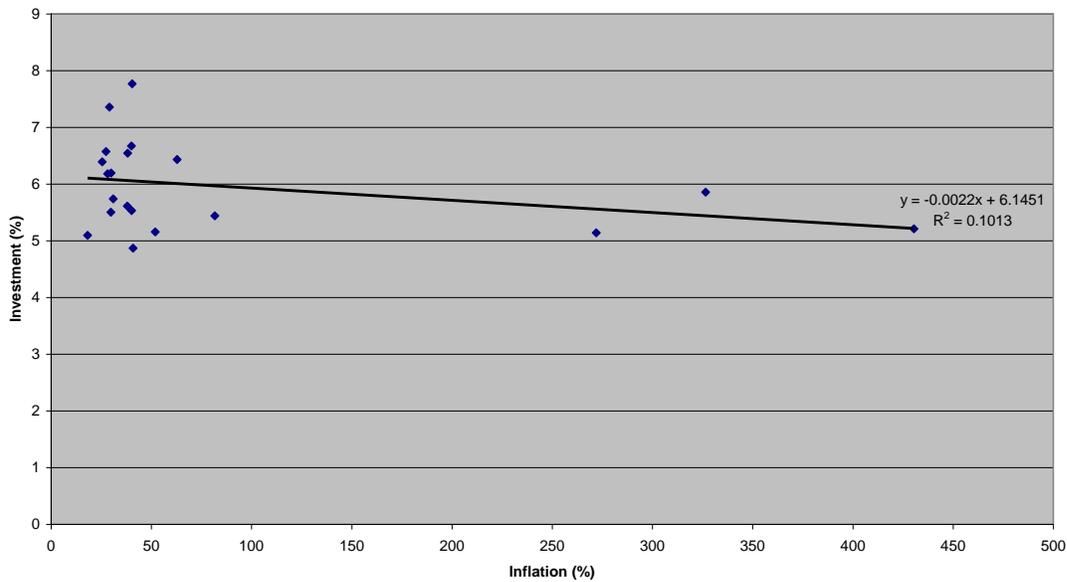
	df	SS	MS	F	Significance F
Regression	2.000	74.666	37.333	4.417	0.029
Residual	17.000	143.678	8.452		
Total	19.000	218.345			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	-27.812	12.564	-2.214	0.041	-54.319	-1.305
INVEST	-1.180	0.869	-1.358	0.192	-3.013	0.654
PRDTY	0.023	0.008	2.857	0.011	0.006	0.040

Source: Heston, A., Summers, R., and Atken, B., 2006

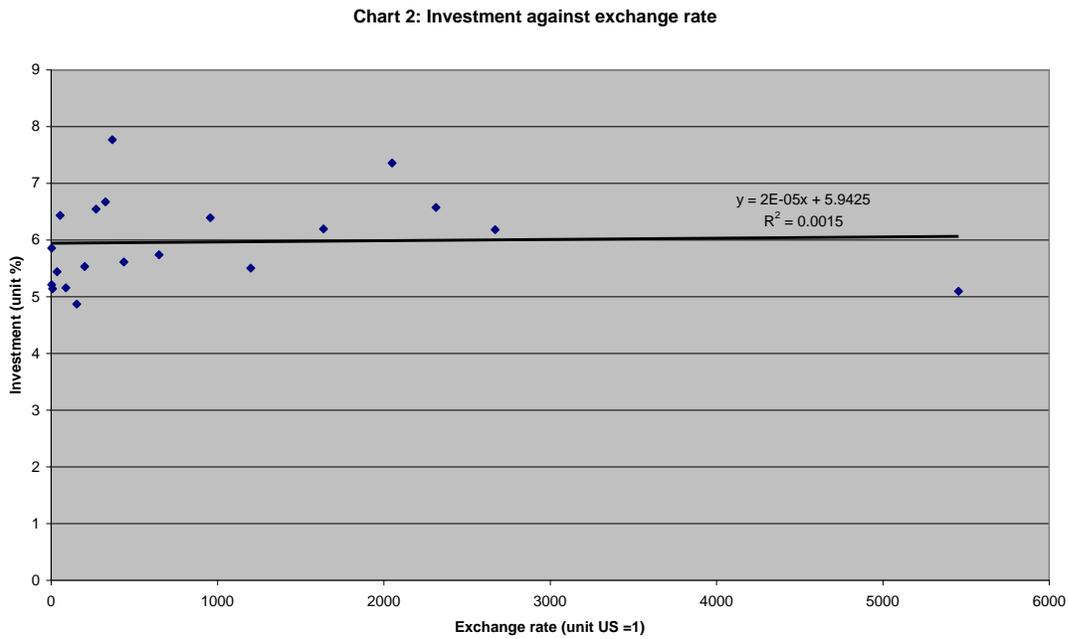
Chart 1

Figure 1: Graph of investment against inflation: Ghana



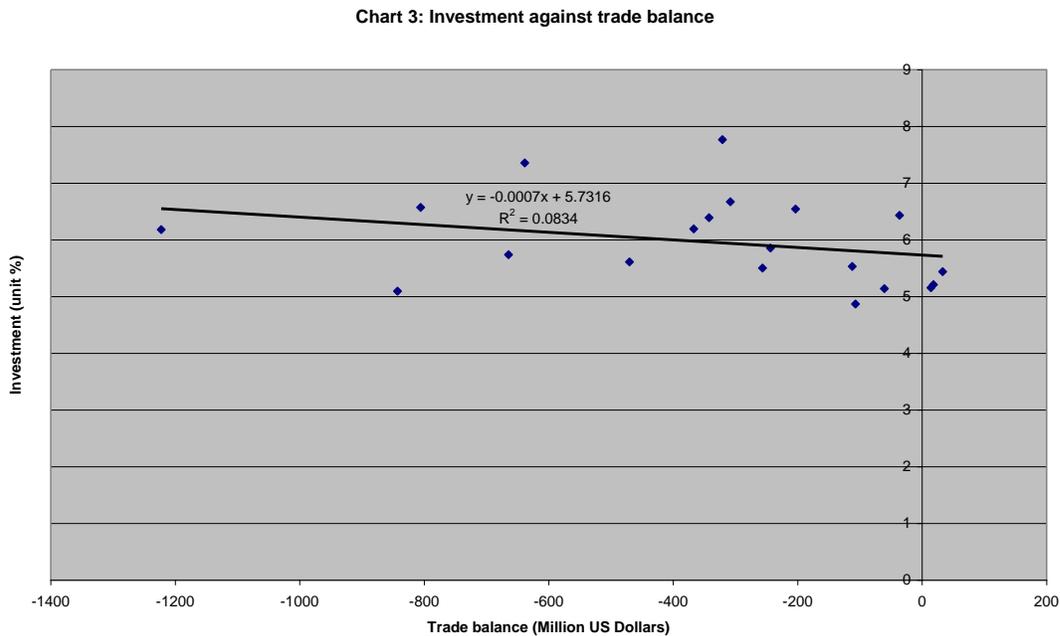
Source: Heston, A., Summers, R., and Aten, B., 2006

Chart 2



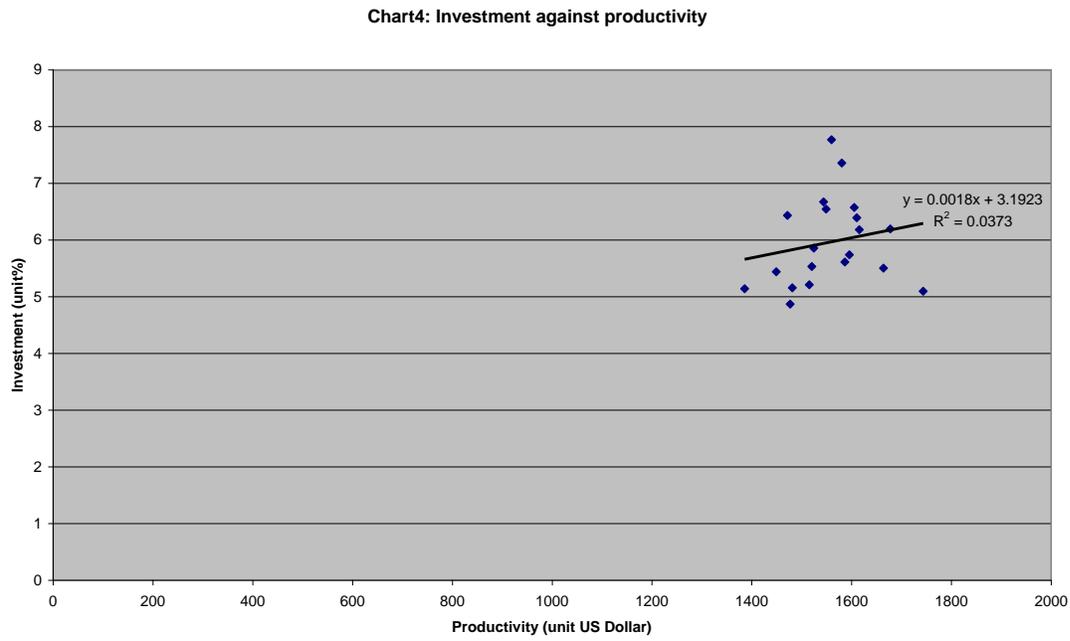
Source: Drawn from data at; Heston, A., Summers, R., and Aten, B., 2006

Chart 3



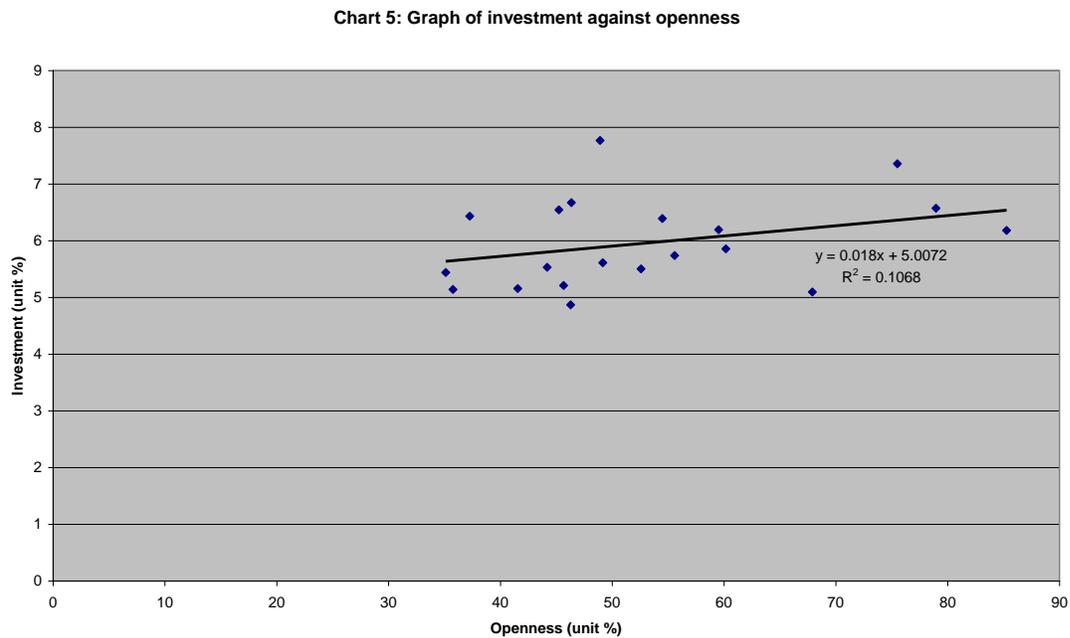
Source: Drawn from data at; Heston, A., Summers, R., and Aten, B., 2006

Chart 4



Source: Drawn from data at; Heston, A., Summers, R., and Aten, B., 2006

Chart 5



Source: Drawn from data at; Heston, A., Summers, R., and Aten, B., 2006