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The Effect of the Liberalization of Investment Policies on Employment and Investment of Multinational Corporations in Africa

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Abstract

There has been a remarkable shift in the attitudes towards globalization. Specifically, the discussion among academics and policymakers has shifted from *whether* globalization should be encouraged to how countries can position themselves to benefit from globalization. This paper focuses on one aspect of globalization – the liberalization of investment policies – and analyzes its impact on employment and investments by multinational corporations in Africa. We use data for 33 countries over the period 1984–2003 and employ a dynamic panel estimator for our analysis. There are two major findings. First, liberalization has a significant and positive effect on investment. Second, liberalization does not have a direct impact on multinational employment – the …/

Keywords: investment, employment, poverty reduction, labour

JEL classification: F23, E22, O16

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effect is indirect liberalization stimulates multinational investments which in turn increases multinational employment. By increasing investment and employment from multinational firms, these liberalization programmes contribute to poverty alleviation.

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1 Introduction

> Private international capital flows, particularly *foreign direct investment*, are vital complements for national and international development efforts. Foreign direct investment contributes toward financing sustained economic growth over the long term. It is especially important for its potential to transfer knowledge and technology, create jobs, boost overall productivity, enhance competitiveness and entrepreneurship, and *ultimately eradicate poverty* through economic growth and development. (UN, 2002: 5)

The above quotation suggests that an expansion in the operations of multinational corporations (MNCs) in host countries can help alleviate poverty in those countries. A large literature explores the relationship between foreign direct investment (FDI) and the growth rate of income in both developing and developed countries with inconclusive results. While some studies find no significant growth impact of FDI (e.g. Carkovic and Levine 2005; de Mello, 1999), other studies find a positive relationship between FDI and income growth (e.g. Hansen and Rand, 2006; Krueger, 1983). Still other studies find that there is heterogeneity in the relationship between FDI and income growth across countries (e.g. Chowdhury and Mavrotas: 2006). Nunnenkamp (2004) argues that FDI may have limited effects on growth and poverty alleviation in less developed countries. While several studies have investigated the relationship between FDI and income growth, what has not been well investigated is the effect of FDI on poverty alleviation. This paper explores the effects of FDI on poverty alleviation by estimating the employment effects of FDI in African countries.

There are several ways by which MNCs can contribute towards poverty reduction and economic growth in host countries.[1] For example, investments by MNCs – i.e., FDI serves as a source of finance for economic development. The role of FDI as a source of finance is particularly important to Africa for three reasons. First, income levels and domestic savings in the region are low. Second, foreign aid to the region has been declining. For example, net official development assistance to sub-Saharan Africa (SSA) declined from US$17 billion in 1990 to US$10 billion in 2001, a decrease of about 41 per cent (World Bank, 2003).[2] Third, the New Partnership for Africa's Development (NEPAD) declaration stipulates that in order for the continent to achieve its Millennium Development Goal (MDG) of reducing the number of people living on less than a dollar a day by half in 2015, the continent needs to fill an annual resource gap of US$64 billion (about 12 per cent of the GDP).[3] Given the low savings rate and the decline in official assistance, the continent may have to rely on MNCs to provide the necessary capital needed for poverty alleviation.

In addition to providing the capital needed for development, MNCs can alleviate poverty by creating employment – directly and indirectly – in host countries.

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1 See Winters (2002) and Winters et al. (2004) for discussions of the mechanisms through which FDI policies affect employment and poverty reduction. Also see Nissanke and Thorbecke (2005) for a discussion on the mechanisms through which globalization can affect poverty alleviation and income distribution.

2 Note that the volume of foreign aid to Africa is envisaged to double as a result of the G8 agreements in 2005.

3 NEPAD is a development plan put together by African leaders to eradicate poverty. For more on this issue see Owusu (2003).

Investments by MNCs often generate new employment (direct employment is higher in Greenfield investments) and create jobs (indirectly) through forward and backward linkages with domestic firms. For example, using data for Namibia, Iyanda (1999) finds that about two to four jobs are created locally for each worker employed by an MNC. Another important aspect of multinational employment is that MNCs tend to pay higher wages than prevail locally. Harrison (1996) finds that the wage differences between foreign-owned firms and domestic firms in Côte d'Ivoire range from 10 per cent to about 90 per cent. Moreover, multinational presence sometimes generates wage spillovers: wages tend to be higher in industries and provinces that have a greater foreign presence (Lipsey, 1994; Lipsey and Sjoholm, 2001). Axarloglou and Pournarakis, (2007) however, find that the employment and wage effects of FDI vary by industry. Finally, MNC employment facilitates the transfer of technology between foreign and domestic firms and it enhances the productivity of the labour force in the host country (Harrison, 1996). It is important to note that multinational employment is particularly important to Africa because unemployment is prevalent and wages are low. For example, the unemployment rates for Lesotho, Namibia, and South Africa in 2001 were about 27 per cent, 34 per cent and 26 per cent respectively (Southern African Development Community Annual Report). In addition, about 46 per cent of the workers in South Africa earn less than the living wage (Fields, 2000). Thus for countries such as South Africa, the contribution of MNCs to employment is very critical: employment by MNCs accounted for about 23 per cent of total employment in South Africa in 1999 (UNCTAD, 2002).[4]

Given the potential impact of multinational investment and employment on poverty alleviation and growth in Africa, it is important to understand the effect of globalization on the nature and operations of MNCs in the region. Such an analysis will provide some insights into the impact of globalization on the poor in the region. This paper focuses on one aspect of globalization – the liberalization of FDI policies – and analyzes its impact on employment and investments by multinational corporations in the region.

There is a vast empirical literature on the effect of the trade and investment policies on FDI. The papers have at least two limitations. First, most of the studies focus on the relationship between trade policy and FDI. As pointed out by Taylor (2000), government policy on FDI typically involves more than one policy (e.g., restrictions on profit expatriation and threat of expropriation) and is generally more complex than trade policy.[5] Nunnenkamp (2002: 10) surveys the literature on liberalization and FDI and notes that 'the problem with essentially all of these studies is that they use trade-related variables that are seriously flawed'. Specifically, most of the studies use (exports+imports)/GDP as a measure of openness to foreign investment. One problem with using trade ratios as a measure of openness is that it is biased towards large countries. Furthermore, as pointed out by Rodrik and Rodríguez (2000), using trade ratios as a policy variable is problematic because policymakers do not directly control trade volumes. Another limitation of the literature is that most of the studies employ a cross-sectional analysis and a few employ a fixed-effects technique. This is problematic for two reasons. First, cross-sectional analysis precludes one from analyzing the impact of policy over time. Second, FDI and multinational employment have lagged endogenous regressors as well as unobserved country fixed-effects which are correlated

4 See Asiedu (2004a) for a review of the literature on the labour market effects of FDI in Africa.

5 See Taylor (2000) for a review of the literature on the effect of investment and trade policies on FDI.

with the regressors hence the orthogonality condition is not likely to be met for a fixed-effects estimator to produce consistent estimates. Here, an IV estimator that accounts for correlated fixed effects and endogenous regressors is more appropriate (Arellano and Bond, 1991).

We use data for 33 African countries over the period 1984–2003 to examine the effect of the liberalization of trade and investment policies on FDI and multinational employment. In analyzing the effect of liberalization on investment, we use two measures – data on FDI flows from the World Bank and changes in the assets of affiliates of US multinational corporations in host countries. In determining the impact of liberalization on multinational employment, we use data on employment of affiliates of US MNCs in Africa.[6] We find that liberalization has a significant and positive effect on investment. However, liberalization does not have a direct impact on multinational employment – the effect is indirect: liberalization stimulates multinational investments which in turn increases multinational employment.

There are three reasons for focusing on Africa. First, many African countries have liberalized their investment framework. Using the elimination of controls on capital accounts as a measure of liberalization, Asiedu and Lien (2003) find that liberalization was more widespread in SSA than in other regions: from 1980–89 to 1990–99, the number of countries that had open capital account regimes in SSA increased by about 350 per cent. This compares with an increase of 33 per cent for Latin America and a decrease of 33 per cent for East Asia.[7] Another reason for focusing on Africa is that the impact of liberalization on FDI varies by region (Asiedu and Lien, 2003; Asiedu and Gyimah-Brempong, 2005). Furthermore, FDI in Africa is concentrated in natural resources and many have argued that resource-seeking investments are less sensitive to policies and conditions prevailing in host countries. The third reason for focusing on Africa is that because of the relatively small GDPs and low incomes, FDI may be more important for poverty alleviation in SSA than in other regions.

This paper contributes to the literature in several ways. First, it addresses some of the limitations of previous studies. Specifically, the measures of FDI policy that we employ can be directly altered by policymakers. Our main policy variable is a composite measure that reflects the investment climate in host countries. This FDI policy variable has four components: risk to operations, taxation, repatriation of profits, and labour costs. As a robustness check, we also run regressions using three alternative indices of openness that measure restrictions on capital account transactions, restrictions on trade and investment, and restrictions on the repatriation of profits. Our analysis also addresses the endogeneity and omitted bias problems – we employ a dynamic panel General Method of Moments estimator proposed by Arellano and Bond (1991) for our estimations. Another contribution of the paper is that we examine the effect of liberalization on both FDI and multinational employment. This contrasts with previous

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6 There are two reasons for using US data. First, data on investment and employment of foreign affiliates of MNCs in Africa are not readily available except for the affiliates of US MNCs. US MNCs are required by law to provide detailed information about the activities of all their affiliates in foreign countries, hence the data they provide are of sufficient quantity and quality to be used for statistical analysis. Second, the US is the largest source country of FDI to Africa, accounting for over 20 per cent of FDI to the region (UNCTAD, 2002).

7 Many countries in East Asia imposed capital controls in the 1990s when they experienced the financial crisis.

studies that examine the effect of liberalization on *either* FDI *or* multinational employment. Finally, our analysis has important policy implications in that it permits us to evaluate the effectiveness of investment liberalization. For example, if liberalization is not having the desired effect, then policymakers may need to re-evaluate their strategies. This is particularly important since investments and employment by multinationals play a crucial role in poverty reduction in Africa.

The remainder of the paper is organized as follows. Section 3 presents the estimated equation and discusses the estimation method, Section 3 specifies the hypothesis and also describes the data, Section 4 presents the statistical results and Section 5 presents the conclusion and policy recommendations.

2 Model and estimation method

2.1 Estimation method

In this section, we summarize the empirical equations we estimate and describe our estimation method. We are concerned with the effects of FDI policies on multinational investments as well as employment. We therefore estimate two equations:

$$FDI_{it} = \alpha_0 + \alpha_1 FDI\ POLICY_{it} + \mathbf{X}\beta + e_{it} \quad (1)$$

$$E_{it} = \alpha_2 + \alpha_3 \text{FDI POLICY}_{it} + \mathbf{Q}\gamma + \varepsilon_{it} \quad (2)$$

where FDI_{it} is a measure of FDI in country i in year t, E_{it} is the number of employees of affiliates of US MNCs in country i in year t, **X** and **Q** are a vector of control variables, e_{it} and ε_{it} are stochastic error terms, and α, β and γ are are coefficients to be estimated.

In panel estimation, neither the Generalized Least Squares (GLS) estimator nor Fixed Effect (FE) estimator produces consistent estimates in the presence of dynamics and endogenous regressors. The investment and employment equations that we estimate have lagged endogenous regressors as well as unobserved country fixed effects which are correlated with the regressors hence the orthogonality condition is not likely to be met for a GLS or FE estimator to produce consistent estimates. An IV estimator that accounts for correlated fixed effects and endogenous regressors is therefore needed.

Arellano and Bond (1991) have proposed a dynamic panel General Method of Moments (GMM) estimator that produces consistent estimates in the presence of dynamics and endogenous regressors. We use the dynamic panel (DPD) estimator partly because we do not have reasonable instruments for the endogenous regressors that can be excluded from the equations and partly because it produces consistent estimates in the presence of endogenous regressors. Arellano and Bond provide a family of dynamic panel GMM estimators in the DPD98 programme that allows for one to estimate coefficients from

levels, first difference, or orthogonal deviation of the variables.[8] In this study, we estimate the equations in first difference form.

The DPD estimator is given as:

$$\hat{\theta} = (\bar{\mathbf{X}}'\mathbf{Z}\mathbf{A}_\mathbf{N}\mathbf{Z}'\bar{\mathbf{X}})^{-1}\bar{\mathbf{X}}'\mathbf{A}_\mathbf{N}\mathbf{Z}'\bar{\mathbf{y}} \quad (3)$$

where $\hat{\theta}$ is a vector of coefficient estimates on both exogenous and endogenous regressors, $\bar{\mathbf{X}}$ and $\bar{\mathbf{y}}$ are the vectors of first differenced regressors and dependent variables respectively, $\mathbf{Z}$ is a vector of instruments and $\mathbf{A_N}$ is a vector used to weight the instruments. The estimator uses all lagged values of endogenous and predetermined variables as well as current and lagged values of exogenous regressors as instruments in the differenced equation. For example, for the equation: $\Delta y_{i3} = \alpha\Delta y_{i2} + \beta\Delta x_{i3} + \Delta\varsigma_{i3}$ we use y_{i1}, x_{i1} and x_{i2} as instruments. For the Δy_{i4} equation, $y_{i1}, y_{i2}, x_{i1}, x_{i2}$ and x_{i3} serve as valid instruments. Instruments for other cross-sectional equations are constructed similarly. These instruments are correlated with the endogenous regressors, but not correlated with the error terms; hence they are 'good' instruments. The dynamic panel estimator is a GMM IV equivalent of an efficient Three Stage Least Squares (3SLS) estimator.

Arellano and Bond proposed two estimators – one and two-step estimators – with the two-step estimator being the optimal estimator. The one-step estimator uses the weighting matrix given by $A_N = (N^{-1}\sum_i Z_i' H Z_i)^{-1}$ where H is $T-2$ square matrix with 2s in the main diagonal, -1s in the first sub diagonal, and 0s everywhere else. The optimal two-step estimator uses an estimated variance-covariance matrix formed from the residuals of a preliminary consistent estimate of $\hat{\theta}$ to weight the instruments. The optimal choice of $\mathbf{A_N}$ is: $A_N = \hat{V}_N = N^{-1}\sum_i Z_i' \hat{v}_i \hat{v}_i Z_i$ where $\hat{v}_i$ is the residual obtained from a preliminary consistent estimate of θ. We use the two-step estimator to estimate the coefficients of the growth equation because it is more efficient than the one-step estimator. However, as suggested by Arellano and Bond and now the standard practice, all our hypothesis tests will be based on the one-step estimates.

In estimating the equations, we lag all variables by one period to ensure that y_{t-1} can be treated as exogenous in period t. We make two identifying assumptions of no auto correlated errors and that the endogenous regressors are not considered predetermined for $v_{i,t}$, but are considered so for $v_{i,t+2}$. This allows us to use all values of x_t up to x_{t-1}

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[8] Orthogonal deviations express each observation as the deviation from the average of future observations in the sample for the same country, and weight these each deviation to standardize the variance. Formally, the orthogonal deviation of the variable $x(x_{it}^*)$ is given as: $(x_{it}^*) = (x_{it} - \frac{x_{i,t+1} + \ldots + x_t}{T-t})(\frac{T-t}{T-t+1})^5$ for $t = 1, \ldots, T-1$. Arellano and Bond show that if the original errors are uncorrelated and homoskedastic, the transformed errors will also be uncorrelated and homoskedastic.

as valid instruments for $\hat{x}_t$. The linear moment restriction implied by the model is $E[(\Delta\tilde{y}_{it} - \Delta\tilde{X}'_{i,t-1}\Theta)X_{i,t-j}] = 0$ for $j = 2,...,t-1$, where $X' = (y_{t-1}, X)$ is the vector of lagged endogenous and strictly exogenous regressors. The consistency of the estimates hinges on the assumption of lack of auto correlated error terms; hence we test for the absence of serial correlation of the error terms. First differencing of the variables naturally generates first order autocorrelation; hence we test for second order autocorrelation in the error terms. We also perform a Sargan test of over-identifying restrictions which is a joint test of model specification and appropriateness of the instrument vector. If all regressors are strictly exogenous, the DPD, RE, and FE estimators are consistent, but only the latter two estimators are efficient. On the other hand, if there are endogenous regressors, the FE and RE estimators are inconsistent. We therefore use a Hausman test to test for the strict exogeneity of all regressors, hence the appropriateness of the DPD estimator used to estimate the model.

3 Hypothesis and data description

3.1 Hypothesis

The impact of liberalization on multinational investment and employment depends on the type of investment and the kind of linkages foreign investment has with the domestic economy. For efficiency seeking FDI, where FDI is driven by cost considerations, investment and trade liberalization may reduce the costs of operating a business in the host country and therefore lead to an increase in FDI flows. Assuming that capital and labour are complementary inputs, one would expect an increase in capital inputs to lead to an increase in labour input, hence employment. When the motivation for FDI is tariff-jumping to serve large protected markets, liberalization policies, such as a reduction in tariffs, may lead to increased or decreased investments and employment. The reason is that instead of producing within the country, firms may import their inputs or final products. As a consequence, the theoretical impact of liberalization on FDI and employment is unclear; liberalization may lead to increased investment and employment, it may lead to the opposite results, or it may not have any employment effects at all. We however note that due to the small sizes of African countries, the tariff jumping motive to serve domestic markets is less likely to be relevant.[9] We therefore hypothesize that liberalization enhances the investment climate in host countries, and therefore should be positively related to multinational investment and employment. In the case of resource extraction FDI, employment is likely to depend on the linkages between foreign producers and the host economy (e.g. whether processing of natural resources by the multinational company takes place in the host economy) and to what extent the foreign company directly employs domestic workers. For natural resource extracting FDI with little processing in the host countries, the employment effect is likely to be low.

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9 The countries in SSA are small, in terms of population and income. For example, 15 out of the 48 countries in SSA have a population of less than two million and about half of the countries have a population of less than six million. With regards to income, about half of the countries have a GDP of less than US$3 billion.

3.2 Data

— Dependent variables

In estimating the FDI equation, we employ two measures of FDI. The first is ratio of net FDI inflow to GDP, FDI/GDP, obtained from World Bank's World Development Indicators, 2005. The second measure is the annual changes in the net assets of US affiliates, USFDI. This measure captures the inflows by new firms entering the country as well as the expansion of capacity by existing affiliates in a country.[10] For the employment equation, we use two measures: the employment by US affiliates as a ratio of a country's labour force and the changes in the number of employees of US affiliates in host countries. The data for employment and assets are from the Bureau of Economic Analysis, US Department of Commerce, and is available at www.bea.gov.

— FDI policy

Our key measure of liberalization policy, FDI POLICY, captures the host country's attitude toward inward investment and is determined by four components: risk to operations, taxation, repatriation of profits, and labour costs. The rating ranges from 0–12, a higher score implies a better investment climate. The data is published by Political Risk Services.[11]

— Control variables

The control variables for the FDI equation are the determinants of FDI suggested by the literature. Specifically, we include, corruption and the effectiveness of the rule of law as a measure of the host country's institutions, GDP per capita to measure the attractiveness of the domestic market, the number of telephones per 1000 population as a measure of infrastructure development and the share of minerals and oil in total exports as a measure of natural resource availability. The data on corruption and rule of law are from Political Risk Services and the remaining data are from the World Bank's World Development Indicators, 2005.

For the employment equation, we included net income of US affiliates as a measure of profits and the wages paid by affiliates in host countries as control variables. We calculated the wage rate as the total employee compensation of US affiliates in a country divided by the number of such employees in a given year. This is a very crude measure of wages since the compensation include the compensation of expatriates employed by the American affiliate in the host country. The data are from the Bureau of Economic Analysis, Department of Commerce. As expected, profits should be positively related to employment and wages should have the opposite effect.

The data are from 1984 to 2003 and are for a sample of 33 African countries over the sample period.[12] Not all countries had complete data for all years. Merging the data

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10 Most of the papers in this area use FDI/GDP as a measure of FDI flows. A few exceptions include Taylor (2000) who uses the same variable as our second measure of FDI, i.e., the changes in the dollar value of the assets of US affiliates. One advantage of using US data is that it is from the same source and therefore the data are consistent. The data from the World Bank are reported by individual countries to the Bank and there are differences across country about what constitutes an FDI inflow.

11 See http://www.prsgroup.com/ for more information about the data.

12 The countries in the sample are: Algeria, Botswana, Cameroon, Central African Republic, Chad, Republic of the Congo, Democratic Republic of the Congo, Egypt, Ethiopia, Gabon, Ghana, Kenya,

gave us a sample of 564 usable observations. Summary statistics of the data are provided in Table 1. From the summary statistics, it is clear that while the average number and size of US affiliated MNCs across the world is relative; there is a wide cross-country variation in the data. Of particular interest is the variance in the number of affiliates, asset size, sales, employee compensation, and also the size of host country. The large variation in the size of host countries suggests the need to account for this size differential.

Table 1: Summary statistics of sample data

Variable	Mean*	Std error	Minimum	Maximum
Affiliates	14.869	24.338	1.0	262.0
Assets	234.303	400.409	2.0	6011.0
Sales	213.213	242.524	1.5	1569.0
Net income	49.888	150.595	-292.0	985.0
Employees	35.534	92.852	0.0	884.0
Employee comp.	3.469	9.243	0.0	115.6
FDI POLICY	4.829	0.899	2.3	6.90
FDI/GDP	2.189	7.5997	-7.115	101.849
Gdpcap	807.357	973.664	84.736	5237.433
GDP	1.15E+10	2.17E+10	1.16E+8	1.47E+11
Growth rate	0.352	6.267	-26.271	66.551
Labour force	7572090	8174275	152924	4.78E+7
Corrupt	2.651	1.071	0.0	6
Govtstab	6.528	2.492	0.0	11.583
Lawandorder	2.729	1.251	0.0	6
Tel	11.966	17.588	0.3	97.70
NatResource	35.867	33.121	0.025	99.101
N	650			

Note: * These are unweighted means.

4 Statistical results

We used the DPD estimator to estimate the two equations. Table 2 presents the results for the FDI equation and Table 3 reports the results for the employment equation.

4.1 Liberalization and FDI

Columns (1) and (2) of Table 2 report the results using the share of FDI in GDP, FDI/GDP, as dependent variable and columns (3) and (4) present estimates using changes in the assets of foreign affiliates of US MNCs, USFDI, as dependent variable.

Libya, Madagascar, Malawi, Mali, Mauritania, Morocco, Namibia, Niger, Nigeria, Senegal, Sierra Leone, South Africa, Tanzania, Tunisia, Uganda, Zambia, and Zimbabwe.

Also, for each dependent variable, we report the results with and without the measure of natural resource availability, NatResource, defined as the share of oil and minerals in total exports.

Table 2: Results of the FDI equation

Variable	(1) (FDI/GDP)	(2) (FDI/GDP)	(3) (USFDI)	(4) (USFDI)
Constant	1.3409***	-5.6200***	10.1136***	11.2241***
	(15.84)	(5.72)	(11.64)	(2.72)
FDI POLICY	0.3810***	0.2891***	18.7989***	19.0229***
	(4.86)	(7.68)	(28.44)	(5.66)
FDI/GDP_{t-1}	0.0950***	0.1594***		
	(24.95)	(14.22)		
FDI/GDP_{t-2}	0.1053***	0.1492***		
	(19.54)	(8.44)		
$USFDI_{t-1}$			0.6163***	0.6410**
			(88.31)	(2.3791.84)
$USFDI_{t-2}$			-0.0357***	0.1648***
			(50.16)	(11.95)
In (GDP per capita)	1.5381***	2.3150**	53.1176***	-574.03***
	(2.98)	(2.79)	(4.37)	(3.51)
Corruption	30.0192***	30.0711**	429.196***	914.4227***
	(3.72)	(2.71)	(76.82)	(15.22)
Rule of law	14.6376***	6.1050***	48.9957***	33.4541**
	(3.62)	(3.61)	(44.81)	(2.20)
In (telephones per 1000 population)	-1.0062***	1.2048***	-27.6699**	136.5619
	(2.98)	(15.93)	(2.36)	(2.17)
Natural resources		0.3210***		47.3481***
		(6.17)		(8.10)
Wald χ^2	382.76 [7]	633.29 [8]	786.53 [7]	521.67 [8]
1st ord. autocor.	-1.56	-1.19	-1.37	-1.09
2nd ord. autocor.	0.47	0.52	0.38	-0.89
Hausman m	118.72 [7]	98.65 [8]	123.42 [7]	67.43 [8]
Sargan	12.32 [63]	15.87 [62]	13.09 [34]	9.74 [68]

Notes: Absolute value of *t* statistics in parentheses. *** significant at α = 0.01, ** significant at α = 0.05, * significant at α = 0.10. Columns 1 and 2 report regressions using FDI/GDP as dependent variable and columns 3 and 4 report the results using changes in the assets of US MNCs, USFDI, as dependent variable.

Table 3: Estimates of employment equation

Variable	Employment Affil/Lab. For.	Employment Affil/Lab.	Employment Total Affil.	Employment Total Affil.
Constant	-0.0538	-0.0080	0.0008	0.0056
	(0.78)+	(0.89)	(0.06)	(0.61)
FDI POLICY	-0.4082	-0.0791	-0.0792	-0.4217
	(1.20)	(0.24)	(0.24)	(1.33)
ln WAGE	-0.6165***	-0.5394***	-0.5394***	-0.4419***
	(6.45)	(4.39)	(4.31)	(4.87)
Net income	0.0008***	0.0009***	0.0009**	0.0013***
	(2.66)	(2.71)	(2.09)	(3.10)
FDI/GDP_{t-1}	0.0237***		0.0133***	
	(3082)		(2.80)	
$USFDI/GDP_{t-1}$		0.0133**		0.0042***
		(1.80)		(4.18)
$Employment_{t-1}$	0.4021***	0.4499***	0.3475***	0.6732***
	(6.83)	(3.40)	(5.15)	(10.63)
Wald χ^2	182.46 [5]	79.54 [5]	143.07 [5]	175.26 [5]
1st ord. autocor.	-2.65	-2.28	-2.15	-3.15
2nd ord. autocor.	-0.33	-0.76	0.86	-0.48
Hausman m	24.46 [5]	55.13 [5]	61.32 [5]	31.66 [5]
Sargan	12.58 [12]	15.44 [12]	16.46 [18]	23.28 [14]

Notes: Absolute value of *t* statistics in parentheses. *** significant at $\alpha = 0.01$, ** significant at $\alpha = 0.05$, * significant at $\alpha = 0.10$.

The results indicate that overall, the FDI equation fits the data reasonably well. In all specifications, there is no evidence of second order serial correlation in the error terms of the differenced equation. Furthermore, the Sargan statistics suggest that the equation is correctly specified and the instrument vector is appropriate for the equation. Finally, the Hausman *m* statistics lead to the rejection of the null hypothesis that all regressors can be treated as strictly exogenous. This suggests that the DPD estimator is the appropriate estimator for the FDI equation.

As shown in Table 2, the estimated coefficient of our proxy for liberalization policies, FDI POLICY, is positive and significantly different from zero at the 1 per cent level or better, for all the specifications, suggesting that all else equal, FDI liberalization is significantly and positively related to FDI inflows to African countries. We performed a robustness check by using three alternative measures of liberalization. We used measures that capture the ability to trade freely, the ability to freely repatriate profits and the ease of capital mobility. The results confirmed our previous findings: that liberalization stimulates FDI.

With regards to the control variables, we note that the coefficients of $USFDI_{t-1}$ and FDI/GDP_{t-1} are positive and significantly different from zero suggesting that current FDI flows are positively influenced by FDI inflows in previous years. Also note that the estimated coefficient of the natural resource variable, NatResource, is positive and

significant: all else equal, a 1 per cent increase in the share of fuel and minerals in exports raises USFDI by about 47.3 per cent (column 4). Thus, omitting the lag dependent variable and/or a measure of natural resource from regressions for the FDI equation, as in previous studies, leads to an omitted variable bias. Another noticeable point is that the estimated coefficients of the rule of law variable are positive and significant at the 1 per cent levels in all the specification, suggesting that countries in which contracts are enforceable will receive more FDI. Also, the estimated coefficients of the corruption variable are positive and significant, implying that corruption promotes investments in SSA. This result, although counter intuitive, is not surprising because investments in Africa are concentrated in natural resources and the countries in the region that are rich in natural resources also rank high on the measures of corruption (e.g. Angola and Nigeria).

In sum, we find strong evidence that liberalization of investment policies is positively associated with FDI flows to Africa. Our result contrasts with that of Asiedu and Lien (2003) who conclude that liberalization had no effect on FDI flows to the region. A plausible explanation for the conflicting result is that the estimations of Asiedu and Lien (2003) suffer from endogeneity and omitted variable bias. Specifically, they employ a fixed-effects estimator and do not include the lag dependent variable in their regressions. As discussed earlier, these problems can lead to misleading results.

4.2 Liberalization and employment

The coefficient estimates of the employment equation are presented in Table 3. Columns 1 and 2 present the estimates of the equation with US affiliates employment/total labour force ratio as the dependent variable. We note that this ratio could increase without an increase in the employment by affiliates of MNCs in the host country. Thus as a robustness check, we also present the estimates of the equation that uses total multinational employment in columns 3 and 4. We reject the null hypothesis that all slope coefficients are jointly equal to zero at any reasonable confidence level and there is no evidence of second order serial correlation in the error terms. The Sargan statistics indicate that the equation is well specified with appropriate instrument vectors and the Hausman test rejects the null hypothesis that all regressors are exogenous. This suggests that the DPD estimator is the appropriate estimator for this equation.

The estimated coefficients of FDI POLICY are insignificant in all the specifications. Also, the estimated coefficients of the lag FDI are positive and significantly different from zero at α=0.05. This suggests that liberalization does not have a direct impact on multinational employment and that the effect is indirect: liberalization stimulates multinational investments which in turn increases multinational employment. With regards to the control variables, the estimated coefficients are all significant at least at α=0.05 and they all have the predicted signs. Specifically, lag employment and net income have a positive effect on multinational employment and wages have the opposite effect.[13] Our results indicate that while liberalization policies may not directly

[13] As a robustness check, we included illiteracy rate, Natural Resources, government stability, and conflict (one at a time) respectively, as additional regressors to see if this will qualitatively affect the coefficient estimates of FDI POLICY and FDI/GDP. The addition of any of these variables as additional regressors did not qualitatively affect the coefficient estimate of FDI POLICY and

increase employment, they do so indirectly through increased employment by multinational corporations that take advantage of the liberalized investment environment these policies create. To the extent that liberalization policies lead to increased employment by multinational corporations, these policies may contribute to poverty reduction in Africa. Our results are consistent with the Nissanke–Thorbecke model (2005) of the mechanisms through which globalization can affect poverty and income distribution; in this case, the transmission mechanism is employment creation by multinational corporations.

5 Conclusion

This paper uses a dynamic panel estimator to examine the impact of the liberalization of FDI polices on investment and employment by MNCs in Africa. There are two major findings. First, liberalization has a significant and positive effect on FDI. Second, liberalization does not have a direct impact on multinational employment – the effect is indirect: liberalization stimulates multinational investments which in turn increases multinational employment. To the extent that FDI is crucial for poverty reduction in Africa (as suggested in the United Nations Millennium Declaration and the NEPAD agreement), countries in the region face at least two challenges. First, they have to attract more FDI. In addition, they have to ensure that the FDI that comes into the country will alleviate poverty.[14] Our empirical results suggest that policymakers can make their countries attractive for FDI by liberalizing their investment regulatory framework.[15] Furthermore, such a policy will also result in an (indirect) increase in employment. We note, however, that FDI tends to employ skilled-labour. Thus to ensure that some of the benefits of FDI go to the poor, countries may have to implement policies that will encourage MNCs to utilize more unskilled labour. For example, countries may provide incentives (such as tax breaks) to foreign firms that hire unskilled workers, locate in rural areas or invest in the agricultural sector. Such a policy will not only improve the welfare of the poor, but will also reduce income inequality in those countries. Another advantage of this policy is that it will diversify foreign investments to the region. Specifically, multinational investment in Africa is concentrated in the primary sector and investments in natural resources tend to generate very little employment and therefore have limited effect on poverty reduction.

We end by pointing out that our results should be interpreted with caution. First, our measure of FDI is based on aggregate investment data. This is problematic because the impact of policy depends on the type of FDI–FDI in natural resources tends to be less sensitive to policy changes than FDI in manufacturing and services. Thus, a better approach is to disaggregate the FDI data and carry out a sectoral analysis. Unfortunately, such data are not readily available for countries in Africa. Second, our analysis focuses on employment by affiliates of US MNCs in Africa. It is possible that

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FDI/GDP. We do not present these estimates because of space considerations. The results are available upon request.

14 See Overseas Development Institute (2002) for a discussion about the effect of FDI on poverty reduction and income inequality.

15 We note, however, that liberalization may sometimes not lead to increased FDI flows – e.g., if the host country has weak institutions. See Asiedu (2004b), Nunnenkamp (2004), and Asiedu (2006) for a detailed discussion.

the results may not hold for MNCs from other countries. Finally, the study does not examine the long run and short run effects of policy changes. As Milner and Wright (1998) show, the long run effects of liberalization policies could be significantly different from the short run effects. Thus, to appreciate the full impact of investment liberalization on the operations of MNCs, one needs to conduct a time series analysis.

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