The Determinants of Employment of Affiliates of US Multinational Enterprises in Africa

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Employment of foreign affiliates of multinational enterprises has been shown to promote growth by boosting wages, increasing the transfer of technology and enhancing productivity in host countries. Yet, the factors affecting such multinational employment in Africa have not been studied. Using panel data, this article indicates that – in contrast to natural resource availability – good infrastructure, higher income, openness to trade and an educated labour force have a significant positive impact on employment. In order to realise the employment benefits of FDI, therefore, sub-Saharan Africa needs to attract investments in non-natural resource industries, and host countries need to improve their infrastructure and educate their population.

> We [the United Nations General Assembly] resolve to halve by the year 2015, the proportion of the world's people whose income is less than one dollar a day. We also resolve to take special *measures to address the challenges of poverty eradication and sustainable development in Africa*, including debt cancellation, improved market access, enhanced Official Development Assistance and *increased flows of Foreign Direct Investment* as well as *transfers of technology*. (UN Millennium Declaration, 8 September 2000) (emphasis added)

1 Introduction

The above quotation suggests that an increase in technological transfer and foreign direct investment (FDI) to Africa will help the continent achieve its Millennium Development Goal (MDG) of reducing poverty rates by half by 2015.[1] The importance of FDI in eradicating poverty is also echoed in the New Partnership for Africa's Development (NEPAD).[2] The poverty MDG is particularly important to sub-Saharan

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1. One of the main themes of the Millennium Development Goals adopted by the UN General Assembly in September 2000 is to reduce the number of people living on less than a dollar a day by 50%. More information is available at http://www.developmentgoals.org/.
2. NEPAD is a development plan put together by African leaders to eradicate poverty and promote growth in the region. The NEPAD declaration stipulates that, in order for the continent to achieve the MDG, the region needs to fill an annual resource gap of $64 billion, about 12% of GDP. Since income levels and domestic savings in the region are low, the bulk of the finance will have to come from abroad: (i) from official sources (finance from multilateral organisations such as the World Bank); (ii) from Foreign Indirect Investment (which includes portfolio investments, bond finance and bank lending); or (iii) from

Africa (SSA) because the poverty rate for the region is very high. About 48% of the region's populations live on less than one dollar a day, as compared with 4% for Eastern and Central Europe, 15% for East Asia, 12% for Latin America, 2% for the Middle East and North Africa, 40% for South Asia, and 24% for all developing countries. Furthermore, for several countries in the region, more than half the population live in abject poverty. For example, the poverty rate for Burkina Faso is 62%, and it is 66% for the Central African Republic, 73% for Mali, 70% for Nigeria and 64% for Zambia.

One way by which FDI can alleviate poverty in host countries is by generating employment. Multinational employment boosts domestic wages, increases domestic employment, fosters the transfer of technology between foreign and domestic firms and enhances the productivity of the labour force. The employment effects of FDI are very important to Africa, the reason being that, in most African countries, wages are low and unemployment is prevalent. For example, the unemployment rates for Lesotho, Namibia and South Africa in 2001 were 27%, 34% and 26% respectively (Southern African Development Community, *Annual Report*, 2002).[3] In addition, about 46% of the workers in South Africa earn less than the living wage (Fields, 2000). Thus, for high unemployment countries such as South Africa, the contribution of FDI to employment is very critical. Foreign affiliates accounted for about 23% of employment in South Africa in 1999 (UNCTAD, 2002).

This article examines the determinants of multinational employment in SSA. The article contributes to the literature in several ways. First, the empirical literature on FDI to Africa is scant. In addition, the few studies in this area have mainly focused on two issues: (i) examining the factors that affect FDI in Africa and (ii) studying the differences in wages and productivity between foreign-owned firms and domestic firms.[4] To the best of my knowledge, this is the first article that examines the factors that affect the employment rates of foreign affiliates in Africa. This is surprising because, as pointed out earlier, one of the important channels by which FDI contributes to growth and poverty reduction is by creating employment.

The article uses panel data to examine the determinants of the employment of affiliates of US multinational enterprises (MNEs) in sub-Saharan Africa over the period 1984-2000. There are two reasons for using US data. First, employment data on foreign affiliates are not readily available, except for the affiliates of US MNEs.[5] Second, the United States is the largest source country of FDI to Africa, accounting for over 20% of FDI to the region (UNCTAD, 2002). Hence, the determinants of MNE employment in Africa can be inferred, albeit imperfectly, from the data on US affiliates located in the

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Foreign Direct Investment. However, official assistance to the region has been declining. For example, net official development assistance to sub-Saharan Africa declined from $17 billion in 1990 to $10 billion in 2001, a decrease of about 41% (World Bank, 2003a). In addition, foreign indirect investment is unavailable to most African countries, since most of them cannot raise funds from international capital markets. As a consequence, the bulk of the external resources needed for poverty alleviation has to come from FDI. For more on this issue see Funke and Nsouli (2003) and Owusu (2003).

3. More information about the Southern African Development Community is available at http://www.sadc.int/.

4. For example, a search of the EonLit database using 'FDI' and 'Africa' as keywords yielded only 4 journal articles on the determinants of FDI. See Asiedu (2003) for a review of these articles.

5. US multinationals are required by law to report detailed financial data about their foreign affiliates, including the number of affiliates, assets, sales, net income, number of employees and total compensation paid to employees in each host country.

region. The results indicate that good infrastructure, higher income, openness to trade and an educated labour force have a positive impact on employment. In contrast, natural resource availability does not have a significant impact on employment. The lack of significance of natural resources is important because FDI in SSA is concentrated in natural resources. Thus the results suggest that, in order to realise the employment benefits that accrue from FDI (such as higher wages, increased worker productivity and technology transfer), SSA needs to attract investments in non-natural resource industries. Furthermore, countries in the region need to open up their markets, improve their infrastructure and educate their populations.

The remainder of the article is organised as follows. Section 2 provides a brief discussion of the employment effects of FDI and Section 3 empirically analyses the determinants of employment of US affiliates in SSA. Section 4 discusses the policy implications.

2 Employment effects of FDI – some stylised facts

This section briefly describes four ways in which MNE employment can promote growth and reduce poverty in host countries.

(i) MNE employment has both a direct and an indirect impact on domestic employment. FDI often generates new employment (direct employment is higher in green filed investments) and creates jobs (indirectly) through forward and backward linkages with domestic firms. Estimates for a number of developing countries indicate that FDI has a multiplier effect on domestic employment. Aaron (1999) estimates that FDI in developing countries created about 26 million direct jobs and 41.6 million indirect jobs in 1997 (a multiplier of about 1.6). Iyanda (1999) obtains a higher estimate for Namibia: about 2 to 4 jobs are created for each worker employed by foreign affiliates.

(ii) MNE employment boosts wages in host countries. A number of studies have shown that MNEs pay higher wages than domestic firms, even after controlling for firm and worker characteristics (see Lipsey, 2002, for a survey). Furthermore, the presence of multinationals sometimes generates wage spillovers: wages tend to be higher in industries and in provinces that have a greater foreign presence (Lipsey, 1994; Lipsey and Sjoholm, 2001).[6] Table 1 summarises the results of three empirical studies that examine differences in wages between foreign-owned enterprises and domestic-owned firms in selected African countries. The data show that foreign firms pay higher wages, with a wage premium ranging from 10% in Côte d'Ivoire to about 130% in Morocco.

(iii) MNE employment fosters technological transfers. One of the most common and least expensive ways by which foreign technology gets diffused in host countries is through labour turnover, as domestic employees (especially employees in higher-level

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6. The conclusions of Lipsey (1994) and Lipsey and Sjoholm (2001) are based on data from the United States and Indonesia, respectively. The empirical evidence regarding wage spillovers is mixed. For example, Aitken et al. (1996) do not find evidence of wage spillovers in Mexico and Venezuela. For a discussion of this issue, see Lipsey (2002).

positions) move from foreign firms to domestic firms.[7] Bloom (1992) finds substantial technological transfer in South Korea when production managers left multinationals to join domestic firms. Indeed, foreign firms sometimes pay higher wages in order to retain their workers, and thereby prevent domestic firms from appropriating their superior technology (see Glass and Saggi, 2002).

Table 1: Difference in wages between FOEs and DOEs in selected African countries

Study	Country	Results
Harrison (1996)	Morocco and Côte d'Ivoire	Foreign-owned firms pay higher wages in 3 out of 12 industries in Côte d'Ivoire and 12 out of 18 industries in Morocco. Wage premium ranges from 10% to 90% in Côte d'Ivoire and 30% to 130% in Morocco.
Mazumdar and Mazaheri (2000)	Cameroon, Côte d'Ivoire, Ghana, Kenya, Tanzania, Zambia and Zimbabwe	100% foreign-owned firms pay higher wages than other firms in Cameroon (25%), Côte d'Ivoire (29%), Ghana (24%), Kenya (22%), Zambia (28%) and Zimbabwe (38%). No significant difference in wages for Tanzania. The wage premium is significantly higher for males.
Te Velde and Morrissey (2001)	Cameroon, Ghana, Kenya, Zambia and Zimbabwe	Foreign-owned firms pay higher wages in Cameroon (8%), Ghana (22%), Kenya (17%), Zambia (23%) and Zimbabwe (13%). The wage premium increases with educational attainment.

(iv) MNE employment enhances the productivity of the labour force in the host country. Several studies have shown that workers in foreign-owned enterprises (FOEs) are more productive than workers in domestic-owned enterprises (DOEs). For example, Harrison (1996) analysed differences in labour productivity between FOEs and locally owned firms in Morocco and Côte d'Ivoire. In 8 out of 12 industries in Morocco, output per worker was higher in FOEs than in domestically owned firms, with a difference in productivity ranging from 50% in electronics to about 130% in non-metallic minerals. In Côte d'Ivoire, the productivity gap existed in fewer industries (3 out of 12). However, the gap was wider, ranging from 50% in chemicals to about 500% in oil. Ramachandran and Shah (1998) also report that added value per worker is 59% higher for wholly foreign-owned enterprises than for local firms in Kenya, 178% higher for FOEs in Zimbabwe and 1,422% higher for FOEs in Ghana. The worker productivity gap may be partly explained by the differences in training opportunities for workers in FOEs and DOEs. Table 2 reports data on the percentage of foreign and domestic firms in Ghana, Kenya, Zambia and Zimbabwe that have a formal training programme. The data indicate that, in all four countries, worker training programmes are more prevalent in FOEs. For example, only 2.6% of the locally owned firms in Ghana have a formal training programme. This compares with 50% for wholly foreign-owned firms. Furthermore, in Kenya and Zimbabwe, the availability of training programmes

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7. See Blomstrom and Kokko (1998) for a survey of the literature on FDI and technological spillovers.

increases with foreign ownership; training is more prevalent in wholly foreign-owned firms than in jointly owned firms.

Table 2: Percentage of FOEs and DOEs providing formal training to workers, 1995

Description of firms	Ghana	Kenya	Zambia	Zimbabwe
Wholly owned domestic firms	2.6	16.1	18.6	38.5
Jointly owned firms	na	38.9	45.5	72.0
Wholly owned foreign firms	50.0	46.2	36.4	84.6

Notes: Data for Ghana were obtained from Ramachandran and Shah (1998). Data for Kenya, Zambia and Zimbabwe were obtained from Dabalen et al. (2003).

3   The determinants of employment of US affiliates in SSA

I use a random-effects panel estimation for my analysis. This approach has two advantages. First, it addresses the problem of omission variable bias. Second, the estimates remain unbiased even when data are missing for some time periods for some cross-sectional units. This advantage of random-effects estimation is particularly important for an analysis of SSA, the reason being that data are not available for some years for several countries in the region. An alternative to the random-effects model is the fixed-effects model. However, I rejected the fixed-effects specification based on the Hausman test. The analysis employs an unbalanced panel of data on up to 34 countries from 1983 to 2000.[8]

The dependent variable is the log (number of employees of foreign affiliates/total labour force in the host country). The data were obtained from the Bureau of Economic Analysis, US Department of Commerce, http://www.bea.doc.gov/ bea/di1.htm. The independent variables are: (i) share of trade in GDP – a measure of openness to trade of the host country's economy; (ii) the percentage of literate population – a measure of the stock of human capital in the host country; (iii) number of telephones per 1000 population – a measure of infrastructure availability in the host country; (iv) real GDP per capita – a measure of the level of income; and (v) a dummy variable which takes on the value 1 if the share of minerals and ores in the host country's exports exceeds 50% or if the host is an oil-exporting country – a measure of natural resource availability in the host country. I also included a trend variable in the regressions to control for changes caused by demand or supply shocks. The independent variables have been employed in several empirical studies on the determinants of FDI (for example, Asiedu, 2002; Morrisset, 2000). A summary of the data is provided in Table 3.

The empirical results are presented in Table 4. The infrastructure variable (measured by the number of telephones per 1000 population) and the human capital variable (measured by the percentage of the population that is literate) are highly correlated.[9] Hence, to avoid multicollinearity, I considered two specifications. Columns

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8. The unbalanced panel causes no problem if the missing data are not correlated with the idiosyncratic errors (Woodridge, 2002).

9. The correlation coefficient is 0.72.

1 and 2 report the results using the infrastructure variable, and columns 3 and 4 report the results using the human capital variable. The results indicate that good

Table 3: Summary statistics, 1983-2000 (34 countries)

Variables	Mean	Std Dev	Min	Max
Log (No. of employees of foreign affiliates/total labour force in the host country)	-15.329	1.626	-18.742	-11.105
Domestic income = Log (real GDP per capita)	6.152	0.976	4.439	8.573
Infrastructure = Log (phones per 1000 population)	1.597	1.185	-0.916	4.79
Human capital = literacy	52.668	20.597	8.919	88.677

Notes: Countries in the sample are Benin, Botswana, Burkina Faso, Cameroon, Cape Verde, Central Africa Republic, Chad, Congo Rep., Congo Dem. Rep., Côte d'Ivoire, Ethiopia, Ghana, Kenya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Senegal, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe.

Table 4: The determinants of employment of US Affiliates in sub-Saharan Africa: random-effects estimation

Variable	(1)	(2)	(3)	(4)
Intercept	143.10[a] (.000)	143.42[a] (.000)	138.74[a] (.000)	138.08[a] (.000)
Domestic income= Log (GDP per capita)	0.370[c] (.062)	0.365[c] (.069)	0.357[b] (.035)	0.352[b] (.039)
Openness to trade = (imports + exports)/GDP	0.009[a] (.000)	0.009[a] (.000)	0.005[b] (.028)	0.005[b] (.027)
Natural resource availability = Dummy variable equals 1 for natural resource countries		-0.080 (.850)		-0.139 (.765)
Time trend	-0.081[a] (.000)	-0.082[a] (.000)	-0.079[a] (.000)	-0.079[a] (.000)
Infrastructure = Log (phones per 1000 population)	0.303[b] (.038)	0.307[b] (.039)		
Human capital = Literacy rate (%)			0.021[b] (.026)	0.021[b] (.031)
Number of countries	34	34	31	31
Number of observations	383	383	350	350

Notes: Dependent variable: Log (number of employees of foreign affiliates/total labour force in the host country). P-values in parenthesis. a, b, and c imply significance at 1%, 5% and 10% respectively.

infrastructure, higher income, openness to trade and a well educated labour force have a positive impact on employment. All else being equal, a 1% increase in infrastructure leads to a 0.30% increase in employment rates (Column 1). A 1% increase in the literacy rate leads to a 0.02% increase in employment rates (Column 3). In contrast, the dummy variable for natural resource-rich countries is not significant, suggesting that natural resource availability does not boost employment in Africa (Columns 2 and 4).

4   Conclusion and policy implications

This article has discussed the benefits of multinational employment and empirically analysed the factors that affect the employment of US affiliates in sub-Saharan Africa (SSA). The results indicate that good infrastructure, higher income, openness to trade and an educated labour force have a positive impact on employment. In contrast, natural resource availability does not have a significant impact on employment rates. The results have three important policy implications. First, they suggest that, in order to realise the employment benefits of FDI (higher wages, increased worker productivity and technology transfer), SSA needs to attract investments in non-natural resource industries. This result is important because FDI in the region is concentrated in natural resources.

The second policy implication is that countries in the region need to improve their infrastructure. Indeed, the infrastructure in SSA is abysmal. In 2000, the number of telephones per 1000 population was 14, as compared with 101 for East Asia, 148 for Latin America, and 82 for all developing countries (World Bank, 2003b). Africa's inadequate infrastructure has also been documented in a number of studies. For example, in a recent World Bank survey, inadequate infrastructure ranked second among the factors that constrain FDI to the region (Batra et al., 2003).[10] Finally, the results suggest that human capital has a positive impact on multinational employment. The seminal work of Borenzstein et al. (1998) also shows that FDI promotes growth only when the stock of human capital in the host country exceeds some minimum threshold. These two results imply that, in order to boost multinational employment and also benefit from the growth-enhancing effects of FDI, Africa needs to educate its population. This is important because illiteracy is prevalent in the continent.

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10. Inadequate infrastructure ranked higher than political instability, exchange-rate risk and inflation. The survey covered 10,000 firms in 80 countries and was carried out between late 1999 and mid-2000. More information about the survey is available at www.info.worldbank.org/governance/wbes/.

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