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Is Africa Integrated in the Global Economy?

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The popular impression that Africa has not integrated into world trade, as suggested by the evolution in simple indicators, has been called into question recently by more formal analysis. This paper refines and generalizes this analysis and lends support to the popular view of disintegration, but only for countries in Francophone Africa. These countries are currently underexploiting their trading opportunities and have witnessed disintegration over time, a trend that is most pronounced in their trade with technologically advanced countries. There is some evidence, on the other hand, that countries in Anglophone Africa are reversing the trend of disintegration, particularly in their trade with advanced countries. [JEL C1, F1, O4]

The state of the current debate on globalization can generally be summarized as: yes, it confers enormous benefits, but it also poses great challenges. In the case of Africa, however, even the first part of this proposition is not uncontested—globalization's benefits have largely proven elusive for Africa.[1] Reaping these benefits is predicated on embracing globalization in the first place. Has Africa done so—has it globalized or has it been marginalized from world trade? On this question, there seems to be an uneasy tension between two views, with distinct policy implications.

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[1]In this paper, Africa refers to sub-Saharan Africa. Globalization refers to integration of goods markets through international trade and not to capital market integration.

According to the first, popular view, Africa has missed out on the opportunities offered by globalization simply because it has not globalized. The statistic that is commonly invoked in support is a dramatic decline in Africa's share of world exports during the past three decades, representing a "staggering annual income loss of US$68 billion—or 21 percent of regional GDP" (World Bank, 2000). Reviving trade is therefore integral to Africa's economic fortunes, a view that is consistent with the research evidence demonstrating the benefits of integration (Sachs and Warner, 1997; and Collier and Gunning, 1999).

The second view is that Africa did take advantage of trading opportunities in line with the evolution in its income and development. Academic support for this view comes from the spate of evidence that demonstrates that Africa does not trade too little: it is an average trader, trading just as much as can be expected given the underlying determinants of trade, such as income, geography, and size (Foroutan and Pritchett, 1993; Coe and Hoffmaister, 1999; and Rodrik, 1999).[2]

These views lead to distinct policy implications. The former sees Africa's declining trade as a source of concern and accordingly places considerable emphasis on policy measures to expand trade opportunities (World Bank, 2000; Sachs, 2000). The latter view sees causality running from growth, and other determinants, to trade and hence is less activist toward, or at least sees less urgency in, the need to promote trade (Rodrik, 1999).

The evidence provided by the recent literature, however, has a number of limitations. The literature focuses on selected, rather than all, components of Africa's trade. It is based on a relatively narrow, rather than a general, benchmark for assessing what "average" or "typical" trade is. It treats Africa as a uniform region, failing to distinguish intraregional specificities. Lastly, econometric methodologies employed in estimating Africa's trade could be refined further.

This paper—which focuses on the second of the two strands in the literature described above—seeks to remedy these limitations. It revisits the puzzle of Africa's trade to shed light on the key underlying issues: whether Africa undertrades or overtrades, and how its trading pattern has changed over time.

We find that countries in Francophone Africa are currently underexploiting their trading opportunities and have witnessed disintegration over time, a trend that is most pronounced in their trade with technologically advanced countries. There is some evidence, on the other hand, that countries in Anglophone Africa are reversing the trend of disintegration, particularly in their trade with advanced countries.

A robustness analysis points to two possible explanations for the contrasting experiences of Francophone and Anglophone Africa. Higher trade-related transaction costs, possibly due to greater inefficiencies in key infrastructure services, and currency arrangements in Francophone Africa may have contributed to its relatively inferior trade performance. The results are robust to the inclusion of variables that control for primary-commodity dependence. That is, the results do not reflect the fact that disintegration is due to Francophone African countries being primary commodity exporters.

[2]Easterly and Levine (1997) suggest that a lot of factors not strictly related to trade, including geography and ethnic divisions, help explain Africa's poor growth performance.

I. Background

Statistics on the evolution in Africa's share of world trade visually suggest that Africa is progressively disintegrating or marginalizing from world trade (Figure 1). The top panel shows that Africa's share of world exports declined from over 4.1 percent in 1980 to about 1.6 percent in 2000, while its share of world imports declined from over 3.2 percent to 1.3 percent over the same period. More disturbingly, the bottom panel suggests that Africa's share of trade in commodities has also declined significantly from about 8 percent in 1980 to about 4.4 percent in 2000. Thus, the disintegration from trade is not, or not just, due to a less-than-average performance in manufacturing, in which Africa may not have comparative advantage.

A series of recent papers have subjected this impression to a formal empirical scrutiny by asking the question of how typical Africa's trade is relative to a preselected theoretical benchmark. The salient features of these papers are summarized in Table 1.[3]

Foroutan and Pritchett (1993) use data on trade, excluding that in primary commodities, for the early 1980s to test whether African trade is unusual. Their sample comprises 53 low- and medium-income countries (with per capita GDP less than US$3,000) as reporting countries and 95 partner countries. Thus, the benchmark of what constitutes typical trade is trade of the countries that are similar to African countries. The gravity model is estimated using the Tobit procedure. Foroutan and Pritchett (1993) find no evidence that African countries trade less with each other than other developing countries. In fact, intra-African trade is higher than expected when trade is measured in terms of exports.

Coe and Hoffmaister (1999) test whether Africa's trade is unusual by examining trade flows between developing and industrial countries during 1970–97. They apply a nonlinear procedure to estimate the gravity model and find that in the 1970s Africa overtraded with the North relative to other countries' trade with the North and that over time this overtrading has declined. In the 1990s, Africa's trade was no different from the average developing country's trade with the North.

The model, however, does not control for a key variable, the preferential trading arrangement between the European Union and Africa under the Lomé Convention. Hence, it is difficult to assess whether the Africa dummy is merely picking up the effects of this preferential trading arrangement.[4] Indeed, the decline in the magnitude of overtrading with the North is consistent with the decline in preferential margins under the Lomé Convention as most-favored-nation tariff rates in Europe have declined and as Europe has entered into other preferential trading arrangements.

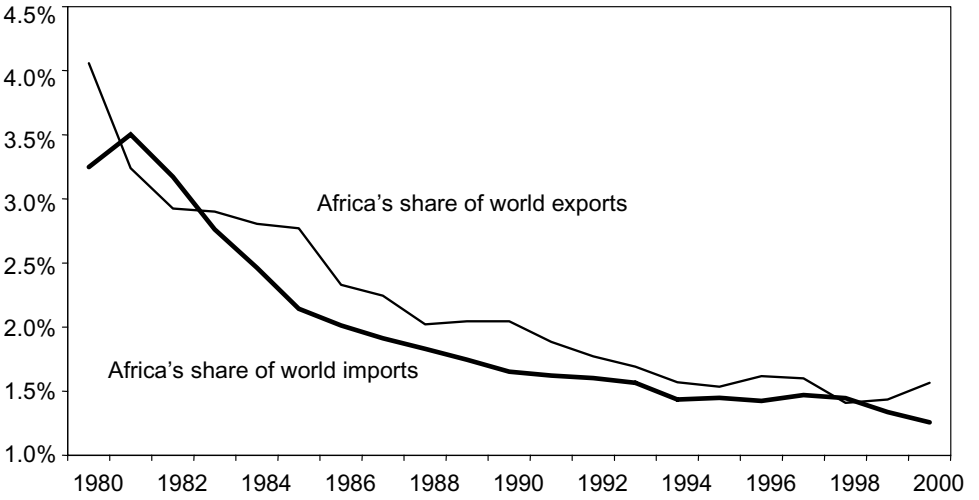
This paper encompasses the earlier body of work, yet differs from it in a number of ways. First, the paper explores African trade in its entirety. In other

[3]Rodrik (1999) tests whether Africa's aggregate rather than bilateral trade is unusual, after controlling for size, income, and average distance from the world. The paper does not employ a strict bilateral gravity model, but like other authors, Rodrik finds that Africa's trade is not dissimilar to other countries' trade.

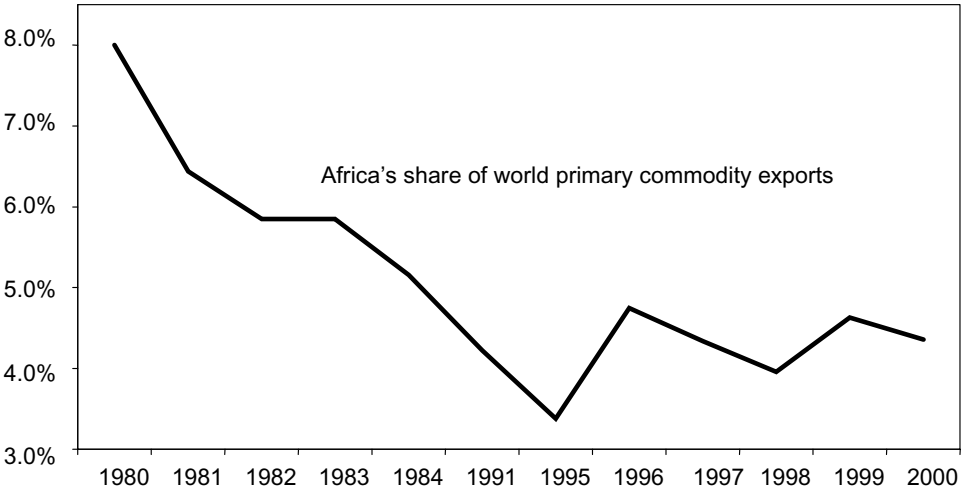
[4]In Foroutan and Pritchett (1993), the Lomé dummy variable has a positive and statistically significant coefficient.

Figure 1. Africa's Share of World Trade, 1980–2000

A. Aggregate Trade



B. Trade in Primary Commodities



Sources: The IMF's *World Economic Outlook* for the top panel and the World Bank's *World Development Indicators* for the bottom panel. Primary commodities comprise fuel, ores, metals, and agricultural products. Data on primary commodities are available only for selected years.

Table 1. Alternative Approaches to Assessing Africa's Trade

Study	Aspect of Africa's Trade Examined	Benchmark for Evaluation	Estimation Methodology	Level of Disaggregation
Foroutan and Pritchett (1993)	Intra-African trade	Trade in manufactures of low- and middle-income countries with all their partners	Tobit estimation on a cross-section where zero-valued observations are replaced by small positive values	All Africa
Coe and Hoffmaister (1999)	Africa's bilateral trade with the North	Trade between North and South	NLS without bootstrapping on a panel including zero-valued observations	All Africa
Subramanian and Tamirisa (2003) – this paper	All aspects of African trade: overall, intra-African, and trade with the North and South	Trade between all countries	NLS with bootstrapping on cross-section and a panel including zero-valued observations	Anglophone and Francophone Africa

Note: NLS is nonlinear least squares.

words, we test for the typicality of Africa's overall trade, its trade with other African countries, and its trade with developed and developing countries. The earlier studies cited above, in contrast, examine the typicality of a selected component of African trade.

Second, instead of treating Africa as a homogenous region, we disaggregate Africa's trade into that of Central and Western Africa (which we refer to as Francophone Africa) and of Eastern and Southern Africa (referred to as Anglophone Africa). Such a disaggregation appears to be warranted in view of notable differences between these groups of countries in terms of institutions, policies, and the overall approach to regional and global integration, and is validated by our findings.[5]

Third, the paper uses a global benchmark for assessment. It seeks to answer whether Africa's trade—and all its components—differ from those of a broad

[5]Language is not a criterion for disaggregation in this context. Indeed, in modeling we control separately for commonality of language (and through this partially for historical similarities) among countries.

group of countries. The sample comprises 73 industrial and developing countries, of which 16 are in sub-Saharan Africa.[6] Thus, the benchmark for evaluating "average" trade is a general one, unlike in Foroutan and Pritchett's (1993) paper, which asks whether African trade is different from trade of low- and middle-income countries, or in Coe and Hoffmaister's (1999) paper, which examines whether Africa's trade with the North is different from other developing countries' trade with the North. Notwithstanding the above, our framework is flexible enough to permit testing the robustness of results to alternative benchmarks.

Finally, the paper employs nonlinear least squares (NLS) to adequately address the problem of zero-valued observations (similarly to Coe and Hoffmaister, 1999) and relies on bootstrapping to make hypothesis testing valid given the nonnormality of residuals.[7]

II. Methodology

The most commonly used analytical framework for studying bilateral trade flows is the gravity model, and it is well suited for addressing the questions posed in this paper. There are numerous successful empirical applications of the gravity model dating back to the early 1960s.[8]

The gravity model relates a measure of bilateral trade to the economic mass of the two countries and the distance between them:

$$TRADE_{ijt} = (Y_{it}\, Y_{jt})^{\alpha}\, (P_{it}\, P_{jt})^{\theta}\, D_{ij}^{\beta}\, e^{\mu_{ij}}, \tag{1}$$

where $TRADE_{ij}$ is bilateral trade between country i and country j, Y_i is nominal GDP in country i, Y_j is nominal GDP in country j, P_i and P_j are population in the two countries, D_{ij} is geographic distance between country i and country j, and t is a time subscript. We expect trade to be positively affected by economic mass ($\alpha > 0$); negatively related to the level of population ($\theta < 0$), indicating that larger countries tend to be more self-sufficient or, alternatively, that poorer countries—countries with larger populations for a given level of GDP—trade less than richer countries; and negatively related to distance ($\beta < 0$). μ_{ijt} is given by

$$\mu_{ijt} = \kappa + \varphi_{\lambda\tau}, \tag{2}$$

where κ are fixed effects for trade between African and other countries, $\varphi_{\lambda\tau}$ are fixed effects for other potential determinants of bilateral trade (specifically, for membership or participation in the Lomé Convention and the CFA franc zone and

[6]The 16 sub-Saharan African countries in our sample account for close to 90 percent of the total trade of sub-Saharan African countries. South Africa is excluded from the sample, given the focus of the paper on the poorer countries of sub-Saharan Africa. Moreover, South Africa's trade data might be distorted: after the demise of apartheid in the early 1990s, the level of *recorded* trade increased dramatically without necessarily a corresponding increase in the underlying level of trade.

[7]Coe and Hoffmaister (1999) assume that residuals are normally distributed and use the NLS estimator without bootstrapping.

[8]See Frankel (1997), Helliwell (1998), and Coe and Hoffmaister (1999) for a discussion of earlier contributions.

for countries that share common borders or a common language). We assume that disturbances are independent and identically distributed and enter equation (1) additively.

Recent papers by Deardorff (1998) and Anderson and van Wincoop (2003) emphasize the importance not only of distance (or trade barriers) between two countries, but also of the average trade barriers of the two countries to all their other trading partners. The empirical gravity model literature often includes a remoteness variable, defined in some studies as the weighted distance to all trade partners,[9] as a proxy for this:

$$R_i = \sum_j w_j D_{ij}, \tag{3}$$

for $i \neq j$ and with $w_j = Y_j / \sum_i Y_i$ for all i. A similar variable is defined for country j. The more remote a pair of countries is from the rest of the world, the more they will tend to trade with each other.

Thus, the specification we estimate is[10]

$$TRADE_{ij} = (Y_i Y_j)^{\alpha} D_{ij}^{\beta} (P_i P_j)^{\theta} (R_i R_j)^{\gamma} e^{\mu_{ij}} + \varepsilon_{ij} \tag{4}$$

This formulation allows straightforward tests of whether, after controlling for the economic size, distance, remoteness, and other factors, bilateral trade between or within regions in Africa is different from trade of other regions—the test is simply whether the estimated fixed effects ($_{\kappa}$ are significant.

The model is estimated for three points in time—1980, 1990, and 2000. This serves as both a comparison with and an update of other work conducted for earlier periods and also facilitates the analysis of evolution in trade over time. Data and their sources are described in Appendix I.

Following Coe and Hoffmaister (1999) and similar to Coe, Subramanian, and Tamirisa, with Bhavnani (2002; hereafter CST, 2002), we employ NLS estimation on a sample that includes zero-valued observations for bilateral trade. Since Africa's trade is relatively concentrated, the share of zero-valued observations in the dataset is not trivial (about 6–11 percent between 1980 and 2000), and thus the choice of an appropriate methodology critically depends on how a given estimator deals with zero-valued observations. The main advantage of an NLS estimator is that it adequately incorporates the information contained in zero-valued observations by treating them as cases where trade is actually zero rather than negligible or not observed. CST (2002) also confirm the advantage of the nonlinear estimation procedure employed in this paper over the alternatives.

Critical values for hypothesis testing are obtained by bootstrapping with 1,000 replications, since skewness and kurtosis tests indicate that residuals are not

[9]Our specification of remoteness is similar to that in Frankel and Wei (1998).

[10]Instead of remoteness, Anderson and van Wincoop (2001) propose a "multilateral resistance" term that is a function of equilibrium price indices, which are not observable. Anderson and van Wincoop are able to estimate their model using demanding computational methods. Coe, Subramanian, and Tamirisa, with Bhavnani (2002), however, show that in the nonlinear framework, the specification with fixed effects yields similar effects to that with remoteness.

distributed normally. Hypothesis testing under the assumption of residuals' normality would be invalid in this case. Point estimates, in contrast, are independent of the distribution of residuals.

There are two alternatives to the methodology we employ. The first is to exclude zero-valued observations (as in Frankel, 1997) from the sample. However, this would be equivalent to nonrandom screening of the data and could bias the results. It would also be unsatisfactory from a conceptual point of view, since zero values in our data set indicate the lack of trade, not missing values. Given our focus on Africa's trade, which has a disproportionate share of zero-valued observations (about double the share for the entire sample), including zero-valued observations is desirable in this study.

The second alternative is to assign arbitrarily small values to the zero-valued observations and then estimate the model in the logarithmic form. This is the approach adopted in Wang and Winters (1991) and Foroutan and Pritchett (1993). However, using ordinary least squares (OLS) and Tobit estimation procedures on a sample in which zero-valued observations are replaced with small values is not free from problems either. Since the logs of small values are large negative numbers, this approach confers unduly large weights on the adjusted zero-valued observations. We compare below the results obtained from using these alternative methodologies to our results.

III. Africa's Trade

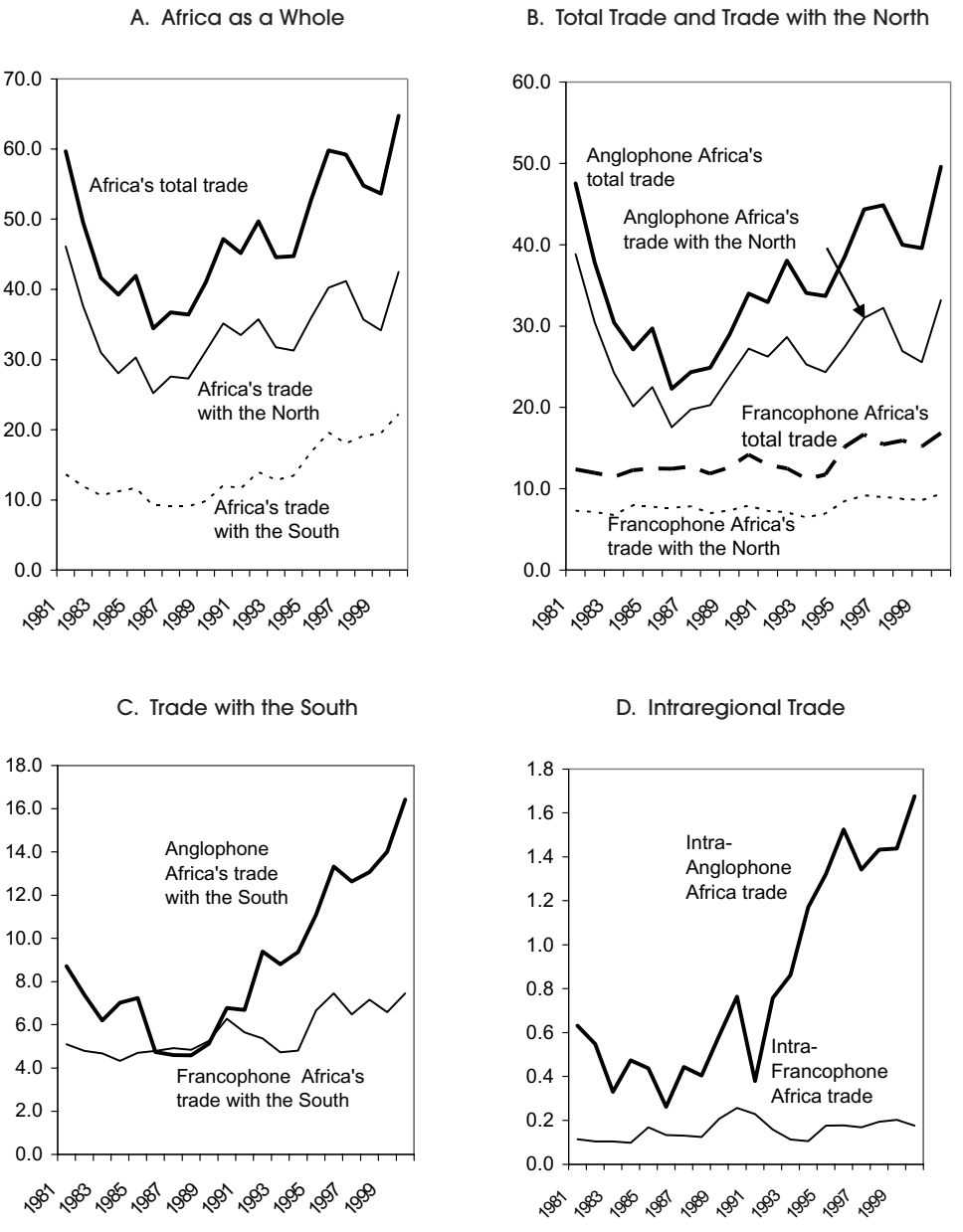
Africa's trade is not uniform. In particular, there are important differences in the trade performance of Anglophone and Francophone Africa in the past two decades (Figure 2). After declining during most of the 1980s, Anglophone Africa's overall trade grew markedly through 2000. Francophone Africa's trade has grown more steadily, but without the dynamism exhibited by Anglophone Africa since the late 1980s. For Anglophone Africa, the largest increases were recorded in its trade with the South and within the region, while trade with the North grew at a slower pace. While Francophone Africa's trade exhibited a similar geographic pattern, with trade with the South growing faster than trade with the North, the magnitude of growth rates in trade in each of these markets has been well below that for Anglophone Africa.

In the formal analysis, we represent the different components of African trade by various dummies. (See Appendix II for a list of the countries that are included in the dummies.) AFR-ANG is a dummy for Anglophone Africa and takes on a value of 1 when an Anglophone African country is either a reporting or a partner country. AFR-FRN is the analogue for Francophone Africa. The other dummies are all bilateral. The AFRAFR-ANG (AFRAFR-FRN) dummy represents trade among Anglophone (Francophone) African countries. Similarly, AFRS-ANG (AFRS-FRN) denotes Anglophone (Francophone) African countries' trade with other developing countries.

AFRNNEU-ANG (AFRNNEU-FRN) denotes Anglophone (Francophone) African countries' trade with advanced[11] countries other than those in the EU that

[11] As defined in the IMF's *World Economic Outlook.*

Figure 2. Africa's Trade, 1981–2000
(Billions of U.S. dollars)



Source: IMF's *Direction of Trade Statistics.*

grant preferences under the Lomé Convention.[12] The rationale for differentiating Africa's trade with EU countries and other advanced countries is related to the effect of the Lomé Convention on trade. The long history of preferential trade embodied in the Lomé Convention has to be controlled for in determining how typical trade is between Africa and the North. If Africa traded more than expected with the North because of preferential arrangements, that would not necessarily shed light on the underlying pattern of trade.[13] A free trade agreement dummy (denoted by FTA) controls for preferential trading relationships.[14]

For the cross-section data, the main findings on whether Africa undertrades are as follows (Table 2). First, currently, Francophone Africa is an undertrader in terms of its overall trade and its trade with the North. The coefficients on the Francophone dummy are negative and significant for 2000; however, Francophone Africa's trade with itself and other developing countries is unexceptional.

Second, and disturbingly, the respective coefficients have become more negative over time, signifying increasing disintegration of Francophone Africa from global trade. For example, Francophone Africa's overall trade, which was normal in 1980, was about 70 percent less than average by 2000 (see columns 1 and 3 in Table 2).[15]

Third, while Francophone Africa is progressively undertrading, the disintegration effect is apparently more pronounced in its trade with the North than with any other group of countries. Between 1980 and 2000, this trade went from being normal to about 80 percent below average (columns 7 and 9 in Table 2). While the coefficient on trade with the South turned negative between 1980 and 2000, it remained insignificant. Only its intra-regional trade shows no clear signs of disintegration. Since technology transfer embodied in capital goods is one of the important channels for trade to enhance growth (see Coe, Helpman, and Hoffmaister, 1997, for example), Francophone Africa's substantial undertrading with its Northern partners, typically the most important suppliers of capital and high-technology goods, raises concerns about respective implications for its growth prospects.

For Anglophone Africa, the results are qualitatively different. In 2000, Anglophone Africa was an average trader in aggregate, with the coefficient on the dummy being negative but insignificant, and also an average trader in terms of the components of trade.

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[12] Since the study covers the period from 1980 to 2000, this dummy does not cover recent entrants to the EU.

[13] Although the non-Lomé industrial countries also grant preferences to Africa under the Generalized System of Preferences, these are less broad in product coverage and subject to greater restrictions and conditions than preferences granted under the Lomé Convention.

[14] This dummy is time-varying in the sense that it reflects common membership in a preferential arrangement at the time of (and after) its formal inception. Thus, for 1980, FTA includes the following arrangements: European Free Trade Association (EFTA), EU-Turkey agreement, the Andean Pact, Australia-New Zealand agreement, Lomé, and Franc de la Communauté Française d'Afrique (CFA) zone. For 1990, it includes, in addition to the above, the Israel-U.S. free trade agreement. For 2000, it includes, in addition, the Israel-EU free trade agreement, Association of South East Asian Nations (ASEAN) Free Trade Area (AFTA), Southern Common Market (MERCOSUR), North American Free Trade Agreement (NAFTA), the Chile-U.S. free trade agreement, and the EU-Northern Africa (also called the EU-Mediterranean) agreements.

[15] The extent of undertrading or overtrading is simply the exponential of the coefficient on the dummy minus one; in this case, $\exp(-1.17) - 1$, which is equal to 0.69.

Table 2. Africa's Trade[1]

	Testing for											
	Africa's Trade with the World			Intra-African Trade			Africa's Trade with the North			Africa's Trade with the South		
Explanatory	1980	1990	2000	1980	1990	2000	1980	1990	2000	1980	1990	2000
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
GDP	0.994*	0.887*	0.740*	0.994*	0.887*	0.741*	0.993*	0.888*	0.741*	0.995*	0.887*	0.741*
POP	–0.203*	–0.090	0.113	–0.203*	–0.090*	0.113	–0.202*	–0.090	0.113	–0.203*	–0.090	0.113
DIST	–0.400*	–0.316*	–0.320*	–0.400*	–0.316*	–0.321*	–0.400*	–0.316*	–0.321*	–0.400*	–0.316*	–0.320*
REM	1.151*	0.871*	0.465**	1.151*	0.871*	0.464**	1.149*	0.871*	0.465**	1.151*	0.871*	0.464**
AFR-ANG	–0.052	0.202	–0.238									
AFR-FRN	–0.068	–0.642	–1.169*									
AFRAFR-ANG				0.501	1.933	1.238						
AFRAFR-FRN				–2.193	0.546	–0.119						
AFRNNEU-ANG							–0.997**	0.603	0.078			
AFRNNEU-FRN							–0.401	–1.163*	–1.634*			
AFRS-ANG										–1.078**	–0.475	–0.469
AFRS-FRN										0.532	0.607	–0.214
ADJ	0.454*	0.400*	0.516*	0.454*	0.400*	0.517*	0.454**	0.400*	0.517*	0.454*	0.400*	0.517*
LNG	0.275	–0.325	0.033	0.275	–0.325	0.031	0.276	–0.325	0.031	0.275	–0.325	0.032
FTA	0.655**	0.782**	0.769*	0.655**	0.783**	0.768*	0.654**	0.782**	0.767**	0.655**	0.783**	0.768*
Adjusted R-squares	0.863	0.873	0.907	0.863	0.873	0.907	0.830	0.873	0.907	0.863	0.873	0.908
F statistic	1,518	1,789	2,561	1,518	1,788	2,560	1,519	1,789	2,560	1,519	1,788	2,560
Number of observations	2,415	2,593	2,613	2,415	2,593	2,613	2,415	2,593	2,613	2,415	2,593	2,613

Source: Authors' estimates.

[1]* (**) indicates significance at the 5 (10) percent level. See Appendix I for definitions of explanatory variables.

Encouragingly, and in contrast with Francophone Africa, Anglophone Africa shows some signs of reversing its disintegration from trade with the North. The coefficient, which was negative and significant in 1980 (signifying undertrading of about 63 percent as column 7 in Table 2 shows) becomes positive by 2000, albeit insignificantly so (column 9 in Table 2). A similar pattern is exhibited in its trade with other developing countries and itself.

Some final remarks can be made on the more general aspects of the results. Coefficients on the standard determinants of the gravity models, such as income, population, and distance, are correctly signed, statistically significant, and yield plausible elasticity estimates broadly in line with those obtained in the literature.

Besides implications for Africa's trade, the results also shed light on the ongoing process of globalization more generally. To the extent that globalization connotes the decreasing importance of geography, the evidence lends support to this proposition. The elasticity of trade with respect to distance declined by almost 20 percent (from –.40 in 1980 to –.32 in 2000), with all the decline occurring in the 1990s.[16] This is consistent with rapid technological progress and wide-ranging liberalization in the trade-related service sectors during the 1990s.

IV. Robustness Tests and Explanations for the Contrasting Trade Performance of Francophone and Anglophone Africa

A number of factors may help explain the dissimilar globalization experiences of Francophone and Anglophone Africa. Differences in the commodity composition of trade and in currency arrangements may play a role in this regard. Likewise, differences in the efficiency of transport and communication sectors could manifest themselves in transaction costs and, thus, trade performance. While a detailed examination of the factors underlying differences in performance of Francophone and Anglophone Africa is beyond the scope of this paper, we can conduct some basic tests of the possible explanations.

Countries in Francophone Africa could be disintegrating from trade because they are primary commodity exporters.[17] In this view, African disintegration could merely reflect the decline in its terms of trade that has been evident during the past several decades. To test this, we run regressions including a dummy for primary commodity exporters (PRIM).[18] Table 3 (columns 1–3) contains these results. The PRIM dummy is positive and significant for 1980 and 1990, suggesting that being a commodity exporter conferred an advantage in those periods. In 2000, this dummy is insignificant but the sign is still positive. This implies that commodity exporters are not uniquely disadvantaged in trading terms. More important for our purposes, the inclusion of the dummy does not alter the basic results; indeed, they are strengthened. In particular, the Francophone Africa

[16] See CST (2002) for more details.

[17] In our sample, four out of six Francophone countries and six out of ten Anglophone countries are primary commodity exporters. Therefore, the set of Francophone countries is not intrinsically more commodity dependent than the set of Anglophone countries.

[18] Primary commodity exporters are defined based on the IMF's *World Economic Outlook.*

Table 3. Robustness Analysis[1]

	Primary Commodities			Transaction Costs			Exchange Rate Misalignments			Panel Estimation[2]	
Explanatory	1980	1990	2000	1980	1990	2000	1980	1990	2000	1980–2000	
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
GDP	1.073*	0.899*	0.740*	0.994*	0.887*	0.740*	0.994*	0.888*	0.740	0.798*	0.798*
POP	–0.229*	–0.096	0.113	–0.203*	–0.090	0.113	–0.203*	–0.091	0.113	0.021	0.021
DIST	–0.414*	–0.320*	–0.320*	–0.400*	–0.316*	–0.320*	–0.400*	–0.316*	–0.320	–0.370*	–0.370*
REM	1.198*	0.867*	0.465*	1.150*	0.871**	0.465	1.151*	0.871*	0.465	0.771*	0.771*
AFR-ANG	–0.575	–0.132	–0.240				–0.051	0.204	–0.237	–0.036	0.073
AFR-FRN	–0.607	–0.968*	–1.170*							–0.791*	–0.595*
AFR-CFA							0.330	–0.583	–1.080*		
DAFR-ANG				–0.008	0.023	–0.026					
DAFR-FRN				–0.009	–0.073	–0.131*					
AFR-ANG-TREND											–0.009
AFR-FRN-TREND											–0.017*
ADJ	0.481*	0.400*	0.516*	0.454**	0.400*	0.516*	0.454**	0.400*	0.516	0.525*	0.525*
LNG	0.252	–0.330	0.033	0.275	–0.325	0.033	0.275	–0.325	0.033	0.000	0.000
FTA	0.725**	0.784	0.769*	0.655	0.782	0.769*	0.656*	0.781	0.769	0.574*	0.574*
PRIM	0.853*	0.497**	0.002								
Adjusted R-squares	0.877	0.874	0.907	0.863	0.873	0.907	0.863	0.873	0.907	0.882	0.882
F statistic	1,567	1,637	2,327	1,518	1,789	2,561	1,519	1,789	2,561	13,503	12,659
Number of observations	2,415	2,593	2,613	2,415	2,593	2,613	2,415	2,593	2,613	54,165	54,165

Source: Authors' estimates.

[1]* (**) indicates significance at the 5 (10) percent level. See Appendix I for definitions of explanatory variables.

[2]Panel regressions include unreported time dummies.

dummy is negative and significant in both 1990 and 2000. This implies that it is now an undertrader and has experienced trade disintegration over the last 20 years. For Anglophone Africa, the results are as broadly the same with and without the inclusion of the primary commodity dummy.[19]

Next we consider if high transport and other trade-related costs are a particular obstacle for Africa's trade (Table 3, columns 4–6). The evolution in these costs would, of course, be affected by certain exogenous factors, such as technological progress, for example. It also crucially depends on domestic policies, which determine the efficiency of certain trade-related service industries, such as transport, port operations, communications, and distribution. Again, the gravity model allows for some preliminary testing of hypotheses about the magnitude of trade-related costs and their evolution over time. As discussed earlier, the distance variable could be considered a proxy for such costs. To test for their effects on African trade, we interacted a dummy for Anglophone and Francophone Africa with the distance variable, denoted in Table 3 by DAFR-ANG and DAFR-FRN, respectively. The results point toward an increase in trade costs for Francophone Africa that decreases trade by about 11 percent between 1980 and 2000.[20]

Another explanation for the differential performance of Francophone and Anglophone Africa relates to exchange rate misalignments (Table 3, columns 7–9). Countries in the CFA zone have pegged their exchange rate to the French franc.[21] The serious and persistent misalignment of the CFA franc until 1994, when it was devalued by 50 percent, is widely acknowledged to have had a debilitating effect on trade performance of the CFA zone countries. To test for such misalignment effects, we redefine the Francophone Africa dummy to exclude the non-CFA zone countries (variable AFR-CFA in Table 3). All the results for Francophone Africa, including the negative and statistically significant coefficient for 2000, broadly carry over to the CFA zone countries. While not necessarily conclusive, the results are generally consistent with the possibility that years of misalignment in the CFA zone might have led its members to undertrading. Future research is needed, however, to substantiate this explanation.

Finally, to confirm that our cross-section estimates for selected years are generally valid, we estimated the same specification on a panel data set comprising annual data for the period 1980–2000. Following CST (2002), we included (unreported) time dummies to capture the effects of changes in prices and exchange rates over time. The results are reported in Table 3 (columns 10 and 11) and are consistent with those obtained for the cross-section dataset.

[19]Of course, one explanation for Africa's disintegration could relate to the increasing vertical specialization that is a more important feature of manufacturing trade than trade in commodities (Hummels, Ishii, and Yi, 2001). Vertical specialization means that goods cross multiple borders in the process of being manufactured, counting as trade each time they do so. Trade thus is a gross rather than a value-added measure. With Africa specializing in commodities, it is excluded from trade-intensive manufacturing transactions. However, as Figure 1.B shows, Africa's disintegration (particularly that of Francophone Africa) appears to be also evident in trade in primary commodities. This is confirmed by the fact that the disintegration results in Table 3 appear to be present, even after controlling for primary commodity dependence.

[20]For Anglophone Africa, the distance coefficient is negative in 2000 but insignificant.

[21]Since 1999, the peg is to the euro.

In the specification without a time trend, the Francophone Africa dummy is negative and statistically significant while that on Anglophone Africa is insignificant (column 10). In column 11, the Africa dummies are interacted with a time trend to measure the integration/disintegration effect over time. The trend for Anglophone Africa is negative but insignificant while that for Francophone Africa is negative and significant, confirming the trend of disintegration for the latter set of countries.

V. Comparison with Earlier Literature

To complement the robustness analysis, we next examine the key factors driving our results. To test whether our sample selection is the driving factor, we estimate the model using the methodologies employed by the previous researchers and restricting our sample accordingly. The results of this calibration exercise are reported in Table 4, column 1 for the Foroutan and Pritchett (1993) paper and in columns 2 and 3 for Coe and Hoffmaister (1999).

Recall that Foroutan and Pritchett (1993) tested whether intra-African trade was different from trade between other developing countries. Restricting our sample in line with their study and applying their estimation procedure, we find similar results—the intra-African trade dummy for 1980 is positive and significant, albeit at the 10 percent level.

We then replicate Coe and Hoffmaister's (1999) results, focusing on North-South trade in a panel data context. Replicating their setup and the estimation method, we find that the coefficient for the dummy for Africa's trade with the North (AFRNEU) is negative and significant without the time trend; including the trend makes the coefficient positive but implies a significant disintegration effect over time. Coe and Hoffmaister (1999) obtain similar results. Thus, we can eliminate the sample as the source of the difference.

Next, to isolate the role of the methodology, we reestimate our basic model (Table 2, columns 1–3) using the methodologies of the previous papers. In this exercise, methodology is the only difference. The results are reported in Table 4. In columns 4–6, for Foroutan and Pritchett (1993), the coefficients on both Africa dummies are negative and significant in 1980 and 1990 and both decline and become insignificant in 2000. Clearly, the use of the Foroutan and Pritchett methodology thus paints an opposite picture compared to our results, with both Anglophone and Francophone Africa reversing the process of disintegration over time.

The application of the Coe and Hoffmaister methodology yields results (columns 7–8) that show that the coefficients on the regional dummies as well as the coefficients of these dummies interacted with the time trend are insignificant. Again, there is a striking contrast with our results, obtained with bootstrapping, where the Francophone dummy and its interaction with the time trend are both significant. We conclude, therefore, that the key factor driving our results is the methodology—nonlinear least squares with bootstrapping on a sample including zero-valued observations—which we consider preferable for reasons explained earlier (and more fully in CST, 2002).

Table 4. Comparison with the Earlier Literature[1]

	Replication of Results			Comparison of Methodologies				
	Foroutan and Pritchett (1993)[2]	Coe and Hoffmaister (1999)[3]		Foroutan and Pritchett (1993)[4]			Coe and Hoffmaister (1999)[5]	
Explanatory	1980	1980–2000		1980	1990	2000	1980–2000	
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP	2.462*	0.462*	0.461*	2.078*	2.066*	1.777*	0.798*	0.798*
POP	0.166	0.388*	0.389*	–0.536*	–0.611*	–0.315*	0.021*	0.021*
DIST	–2.701*	–0.361*	–0.361*	–1.166*	–0.988*	–1.261*	–0.370*	–0.370*
REM	2.585*			1.044*	1.757*	1.018*	0.771*	0.771*
AFR-ANG				–1.610*	–0.952*	–0.021	–0.036	0.073
AFR-FRN				–2.047*	–1.123*	–0.065	–0.792*	–0.595
AFRAFR	2.413**							
AFR-ANG-TREND								–0.01
AFR-FRN-TREND								–0.02
AFRNNEU		–0.343*	0.662*					
AFRNNEU-TREND			–0.067*					
ADJ	–0.669	1.577*	1.580*	–0.380	0.495	–0.319	0.525*	0.525*
LNG	4.560*	0.056*	0.057*	2.631*	2.127*	1.627*	0.000	0.000
FTA	0.925	0.197*	0.194*	1.933*	1.512*	1.073*	0.574*	0.574*
Adjusted R-squares		0.818	0.819				0.882	0.882
F statistic		4,030	3,893				13,503	12,659
Number of observations	974	25,031	25,031	2,415	2,593	2,613	54,165	54,165
Log-likelihood	–3066			–7,456	–7,869	–7,814		
Wald Chi-squared	376			1,085	1,294	1,399		

Source: Authors' estimates.

[1]* (**) indicates significance at the 5 (10) percent level. See Appendix I for definitions of explanatory variables.

[2]Tobit estimation on a sample including South-South trade. Zero-valued observations are replaced with a small positive value.

[3]Nonlinear least squares without bootstrapping on a panel sample including North-South trade. Zero-valued observations are included.

[4]Tobit estimation on the full sample. Zero-valued observations are replaced with a small positive value.

[5]Nonlinear least squares without bootstrapping on the full panel sample. Zero-valued observations are included.

VI. Conclusion

The popular "marginalization-from-trade" hypothesis argues that Africa has not benefited from globalization because it has not globalized in the first place. This view has been challenged recently in a series of papers, which have shown more formally that Africa has not been left behind: Africa trades as much as any other set of traders, given the underlying determinants of trade.

This paper, however, finds support for the "marginalization-from-trade" hypothesis, but only for Francophone Africa. Francophone Africa is an undertrader and, moreover, the degree of its undertrading has increased over time. Anglophone Africa appears to have remained an average trader for the past two decades.

Ominously, Francophone Africa's trade with the North appears to have suffered most over time: ominous, because trade with the technologically advanced North is one of the more important channels for globalization's benefits to be disseminated to Africa. Trade with the North also constitutes the largest component of Africa's overall trade and is hence likely to have a more significant impact on growth. Anglophone Africa, on the other hand, which had undertraded with the North in 1980, has reversed this process and became an average trader with the advanced countries by 2000.

The robustness analysis points to two possible explanations for the contrasting performance of Anglophone and Francophone Africa. Trade-related costs seem to have increased for Francophone Africa. Also, the currency arrangements in the CFA zone may have exerted a depressing effect on trade, owing to persistent exchange rate misalignments. More research is needed in the future, however, to substantiate these findings. The results suggest that primary commodity dependence is not a factor in explaining trade developments for Africa consistent with the decline in Africa's share of global trade even in primary commodities.

Overall, the results in this paper suggest that the sanguine policy prescription, stemming from the view that Africa trades adequately, may need to be reconsidered. Policy action to assist Africa to better exploit its trade opportunities would seem appropriate. Of course, views differ on the nature of such action—from calls for active government intervention to facilitate export diversification (Sachs, 2000) to the need to maintain competitiveness (World Bank, 2000). At the very least, trade regimes that continue to be highly distorted in a number of African countries need to be liberalized (Subramanian and others, 2000).

APPENDIX I
Legend and Data Sources

Variable	*Definition (Source)*
Trade	Sum of bilateral exports and imports (*Direction of Trade Statistics*, IMF)
GDP	GDP of the reporting country times the GDP of the partner country (*World Economic Outlook* (WEO), IMF)
POP	Population of the reporting country times population of the partner country (WEO)
DIST	Geographical distance between capitals of the reporting and partner countries (Fitzpatrick and Modlin, 1986)
REM	Remoteness is the weighted distance to all trading partners (as defined in the text)
ADJ	Dummy that takes on a value of 1when reporting and partner countries share a common border
LNG	Dummy that takes on a value of 1 when reporting and partner countries share a common language (Coe and Hoffmaister, 1999)
AFR-ANG	Dummy that takes on a value of 1 when either the reporting or partner country is an Anglophone African country
AFR-FRN	Dummy that takes on a value of 1 when either the reporting or partner country is a Francophone African country
AFRS-ANG	Dummy that takes on a value of 1 when the reporting or partner country is an Anglophone African country and the partner or reporting country is a developing country
AFRS-FRN	Dummy that takes on a value of 1 when the reporting or partner country is a Francophone African country and the partner or reporting country is a developing country
AFRAFR-ANG	Dummy that takes on a value of 1 when the reporting and partner country are Anglophone African countries
AFRAFR-FRN	Dummy that takes on a value of 1 when the reporting and partner country are Francophone African countries
AFRNNEU-ANG	Dummy that takes on a value of 1 when the reporting or partner country is an Anglophone African country and the partner or reporting country is a non-Lomé industrial country
AFRNNEU-FRN	Dummy that takes on a value of 1 when the reporting or partner country is a Francophone African country and the partner or reporting country is a non-Lomé industrial country
AFR-CFA	Dummy that takes on a value of 1 if a country is a member of the CFA currency zone
FTA	Dummy that takes on a value of 1 when the reporting or partner country is a member of one of the free trade or regional integration agreements listed in footnote 14 of the paper
PRIM	Dummy that takes on a value of 1 if a country is a primary commodity exporter as defined in WEO
AFR-CFA	Dummy that takes on a value of 1 when reporting and partner countries are members of the CFA currency zone
DAFR-ANG	Dummy that takes on a value of the distance variable when the reporting country is an Anglophone African country and zero otherwise
DAFR-FRN	Dummy that takes on a value of the distance variable when the reporting or partner country is a Francophone African country and zero otherwise
AFRAFR	Dummy that takes on a value of 1 when the reporting and partner country are African countries
AFR-ANG-TREND	The Anglophone Africa dummy (AFR-ANG) variable interacted with a time trend
AFR-FRN-TREND	The Francophone Africa dummy (AFR-FRN) variable interacted with a time trend
AFRNNEU	Dummy that takes on a value of 1 when the reporting or partner country is an African country and the partner or reporting country is a non-Lomé industrial country
AFRNNEU-TREND	The AFRNNEU dummy variable interacted with a time trend

Appendix II
Lists of Countries

Africa	*Francophone Africa*	*Anglophone Africa*	*Lomé*	*CFA*	*Non-Lomé Industrial*
Cameroon	Cameroon	Ethiopia	Cameroon	Cameroon	Australia
Congo, Dem. Rep. of	Congo, Dem. Rep. of	Ghana	Congo, Dem. Rep. of	Congo, Rep. of	Austria
Congo, Rep. of	Congo, Rep. of	Kenya	Congo, Rep. of	Côte d'Ivoire	Canada
Côte d'Ivoire	Côte d'Ivoire	Malawi	Côte d'Ivoire	France	Finland
Ethiopia	Madagascar	Mauritius	Ethiopia	Senegal	Iceland
Ghana	Senegal	Nigeria	Ghana		Israel
Kenya		Tanzania	Kenya		Japan
Madagascar		Uganda	Madagascar		New Zealand
Malawi		Zambia	Malawi		Norway
Mauritius		Zimbabwe	Mauritius		Sweden
Nigeria			Nigeria		Switzerland
Senegal			Senegal		United States
South Africa			South Africa		
Tanzania			Tanzania		
Uganda			Uganda		
Zambia			Zambia		
Zimbabwe			Zimbabwe		
			Denmark		
			France		
			Germany		
			Greece		
			Ireland		
			Italy		
			Netherlands		
			Portugal		
			Spain		
			United Kingdom		

(continued)

APPENDIX II, concluded

Full Sample[1]

Algeria*
Argentina
Australia
Austria
Bangladesh
Bolivia*
Brazil
Cameroon
Canada
Chile*
China
Colombia
Congo, Republic of*
Congo, Democratic Republic of*
Costa Rica
Côte D'Ivoire*
Denmark
Egypt
Ethiopia
Finland
France
Germany
Ghana*
Greece
Guatemala
Guyana*
Hong Kong, SAR
Iceland
India
Indonesia
Iran*
Ireland
Israel
Italy
Jamaica
Japan
Jordan
Kenya
Korea
Madagascar*
Malawi*
Malaysia
Mexico
Mauritius
Morocco
Netherlands
New Zealand
Nigeria*
Norway
Pakistan
Paraguay*
Peru*
Philippines
Portugal
Saudi Arabia*
Senegal
Singapore
Spain
Sri Lanka
Sweden
Switzerland
Taiwan, Province of China
Tanzania*
Thailand
Tunisia
Turkey
Uganda
United Kingdom
United States
Uruguay
Venezuela*
Zambia*
Zimbabwe*

[1]Asterisks denote primary commodity exporters.

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