Journal of International Development
J. Int. Dev. **11**, 859–870 (1999)

POLICY ARENA

COMMODITY TERMS OF TRADE AND INDIVIDUAL COUNTRIES' NET BARTER TERMS OF TRADE: IS THERE AN EMPIRICAL RELATIONSHIP?

MATTHIAS G. LUTZ*
Institute of Economics, University of St. Gallen, Switzerland

Abstract: This paper examines the statistical relationship between aggregate commodity terms of trade and the net barter terms of trade of 66 non-oil developing countries. Stationarity of the estimated long-run equation is tested for each country using Engle–Granger ADF tests. Four different commodity terms of trade series are examined. For more than half the sample a stationary long-run relationship is detected. The responsiveness of the country terms of trade to the overall index varies considerably between countries. These findings suggest that the long-term trend in the overall terms of trade is still relevant to developing countries today.

1 INTRODUCTION

The past ten years have seen a considerable number of papers — many in mainstream journals — analysing long-term movements in the terms of trade.[1] This interest in the terms of trade goes back to Prebisch (1950) and Singer (1950) who argued that the relative price of primary goods to manufactured goods should decline in the long-run. This proposition has become known as the Prebisch–Singer hypothesis (PSH), one of the best-known, but also most controversial ideas in the development literature. Two factors are probably responsible for the resurgence of interest during the past decade. First, there were the new commodity price indices computed by Grilli and Yang (1988), which start at the beginning of this century. Second, the development of new

* Correspondence to: Dr. Matthias Lutz, Institute of Economics, University of St. Gallen, Dufourstrasse 48, 9000 St. Gallen, Switzerland.
[1] An excellent survey of research up to the early 1990s can be found in Sapsford and Balasubramanyam (1994). More recent findings are summarized in Lutz (1999).

CCC 0954–1748/99/060859–12$17.50

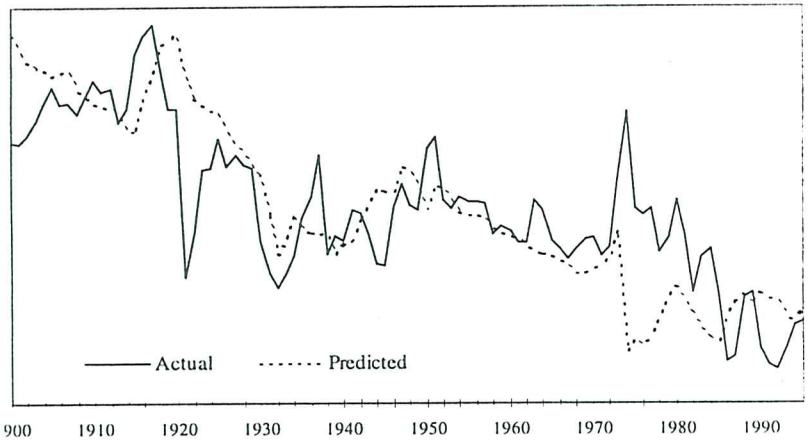


Figure 1. Actual and predicted non-fuel commodity terms of trade, 1900–96. Notes: The diagram shows the actual non-fuel commodity terms trade and the estimated long-run trend (Lutz, 1999).

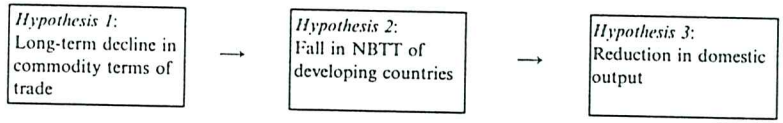
methods to analyse time-series data has led to several reassessments of the previous evidence.

Hans Singer (1991) has commented unfavourably on these new developments, arguing that new econometric techniques are unlikely to make the data confess any more than the simpler, more intuitive methods used in the past. However, I would argue that this 'old wine in new bottles' (Singer, 1991) has actually been useful. Since econometric results are usually not independent of the method by which they are estimated, the more recent findings are likely to be more reliable. Nevertheless, there has been no complete consensus on the existence of the trend so far. Economists at the IMF, for instance, have accepted the existence of a long-term decline[2] (IMF, 1995, p. 350). In contrast, Aizenman (1997) argues that there is little support for this view. In a recent paper, however, Lutz (1999) implements a very general test of the PSH and finds strong statistical support for the existence of a downward trend in the long run. Figure 1 depicts both the actual series for the overall non-fuel commodity terms of trade, and his estimated secular trend series.

In this study, the focus is not on the existence of a trend *per se*. Rather, the aim is to examine empirically another important link in the terms of trade argument. A simplified version of the latter goes as follows. There is a long-term decline in the *commodity terms of trade* (CTT), i.e. the price of primary commodities relative to the price of manufactured goods traded on world markets. Since developing countries are primary product exporters, this will be reflected in a decline of their *net barter term of trade* (NBTT), i.e. the relative price of a unit of their exports to a unit of their imports.

[2] In IMF (1995), they take it as '... given that prices [of commodities] have been trending downward over most of the past 95 year ... '.

The decline in the NBTT, in consequence, leads to a *ceteris paribus* decline in real output.[3] The sequence of argument can be sketched as follows:



Research on the PSH has primarily focused on *Hypothesis 1*. Based on the results in Lutz (1999), I will take this hypothesis as given, i.e. supported by the evidence. *Hypothesis 3* has recently been examined by Barro (1997) in the context of his analysis of the determinants of growth across countries. His results provide clear support for *Hypothesis 3*. The point estimate of the partial elasticity of real output with respect to the NBTT is 0.137 (standard error: 0.030). This suggests that, on average, a ten percentage point decline in a country's NBTT is associated with a 1.37 percentage point reduction in output.

This paper examines the evidence on *Hypothesis 2*. The question is to what extent the overall commodity terms of trade — the subject matter of the debate on the long-term trend — is relevant to individual developing countries. The statistical analysis is fairly low-tech — i.e. 'old bottles' in Hans Singer's words — exercise, which aims to establish a number of basic facts. Surprisingly, it has not been undertaken previously. There are several reasons why one may question the existence of an automatic link between the CTT and the NBTT of individual developing countries. Here I want to discuss two of these, the changing composition of developing country exports in general, and the role of aggregation at the country level.

2 THE CHANGING STRUCTURE OF EXPORTS AND NET BARTER TERMS OF TRADE

While it was unproblematic in the 1950s to assume that developing countries (LDCs) were primary product exporters, this is no longer the case. In 1992, manufactured goods constituted more than half of all developing country exports (Nafziger, 1997, p. 81). Of course, a statistic like this is considerably influenced by a few countries: the four original East Asian Tiger economies accounted for a third of this total (Nafzinger, 1997). In Table 1, I have summarized changes in the composition of exports over a two-decade period for a sample of 66 non-oil developing countries.[4] Although for a relatively short period only, these figures illustrate the general trend towards manufacturing exports. While the share of agriculture-based primary product exports dropped by more than a quarter, from 67 to 49 per cent, that of manufactured goods exports nearly doubled from 15 to 29 per cent. Note, however, that these figures are not completely representative of the share of fuels and mineral exports, since the major exporters of these commodities are excluded from the sample.

[3] While the effect of a terms of trade change on national income is immediate, real output will change if the changes in the terms of trade lead to a shift in domestic employment.

[4] See the Data Appendix for a more detailed description of the countries in the sample. The selection of countries proceeded purely on the basis of data availability.

Table 1. Average export shares, 1970–90. Notes: the data are average percentage shares of merchandise exports for 66 non fuel-exporting developing countries. (*Source*: The World Bank, *World Development Indicators 1997*.)

	1970	1975	1980	1985	1990
Fuels, minerals, and metals	19	22	25	23	20
Other primary commodities					
Food	52	50	45	42	39
Non-food primary commodities	15	13	11	10	10
Manufactures	15	17	19	24	29

Table 2. Sample description. Notes: *n* denotes the number of countries in the given category. (*Source*: The World Bank: *World Data 1995* and *World Development Indicators 1997*.)

	n	NBTT	Average % of merchandise exports, 1970–90			
		average annual growth (%), 1960–93	Fuels, metals, minerals	Food	Non-food primary products	Manufactured goods
Total	66	−0.06	21	46	12	21
Region						
Africa	30	−0.20	25	46	16	12
Latin America	23	0.24	20	51	7	21
Asia	13	−0.29	13	35	11	40
Income per capita						
Low	22	−0.50	22	50	18	10
Medium	22	0.08	22	42	11	23
High	22	0.23	20	45	6	29

The reason is that these commodities are not covered by the Grilli and Yang (1988) (GY) series on which the empirical analysis in this paper is based. Also not in the sample are the semi-industrialized Southern European countries.

The overall figures hide some important detail. Table 2 reveals an important degree of heterogeneity in terms of export structure in this sample of developing countries. While there are no great differences with respect to the share of the fuels, minerals and metals category, there are clear differences with respect to manufacturing exports. The latter amount to 40 per cent on average over the period for Asian countries, but only 12 per cent for African countries. Similarly, the manufactured goods share in total exports is much lower among the poorer countries.[5] Interestingly, the dependence on agriculture-based primary products is very similar for African and Latin American countries (58 against 62 per cent).

Despite this, there is a major difference between African and Latin American countries when it comes to the development of their NBTT. The data for 1960–93 show[6] that the Latin American countries stand out by a long way with on average positive NBTT growth rates, while African and Asian countries have seen a deterioration in their NBTT. These figures suggest that Latin American countries must

[5] See the Data Appendix for detail on the definitions.

[6] This is the longest time period for which there is data across a large number of countries.

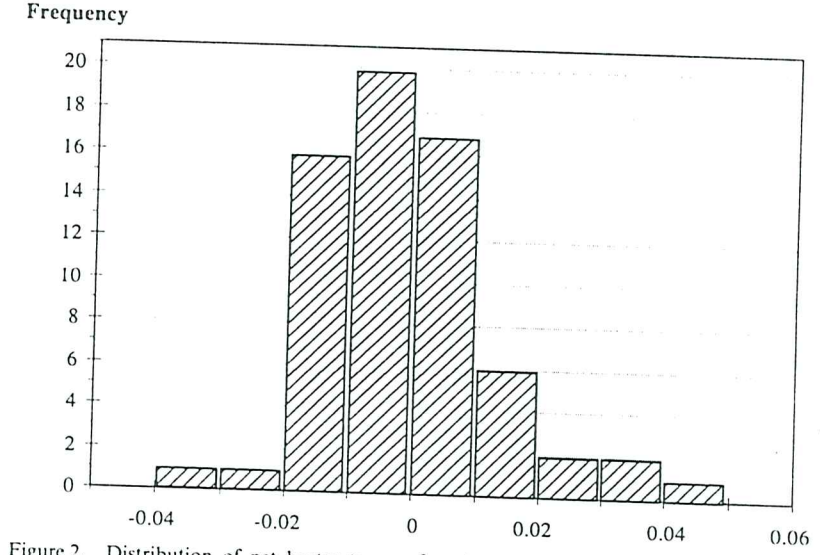


Figure 2. Distribution of net barter terms of trade growth rates (66 non-fuel developing countries). Notes: the data points are average annual NBTT growth rates. (*Source*: The World Bank: *World Data 1995*.)

have exported a very different composition of agriculture-based primary products to that of the African countries. The most adverse terms of trade movements were on average experienced by Asian countries, in spite of their greater dependence on manufacturing exports. When the sample is split according to per capita income levels, it becomes clear that the poorest countries are also those with the worst NBTT developments during the sample period. As the above evidence in Barro (1997) suggests, such adverse movements in the NBTT could be one reason why these countries have failed to catch up.

The second important reason why the overall CTT may not tell us all that much about what happens to individual countries' terms of trade has to do with the aggregate nature of the CTT series. GY based their four commodity price indices on different baskets of the most important primary commodities traded on world markets. Overall, they include 24 different commodities. The weights used to create the four indices (overall, food, non-food agricultural and metal price series) reflect their shares in world exports. The manufactured price index used to deflate these series to create the CTT indices reflects export unit values for a number of industrial countries. While these series may give a good indication of *general* movements in globally traded commodities, they may not be closely related to the specific commodities exported, and manufactured goods imported, by individual LDCs. Figure 2 shows the distribution of mean NBTT growth rates for our sample of 66 non-fuel developing countries. It illustrates a great deal of diversity. Half the countries fall into the interval between one per cent and minus one per cent, but for the other half NBTT have grown at smaller or faster average annual rates. The key implication of the Figure is that, even though the mean across the sample lies close to zero at

−0.06 per cent growth per annum, individual country NBTT growth rates have varied substantially around this value and may be not be proxied very well by the CTT series developed by GY.

3 THE EMPIRICAL RELATIONSHIP BETWEEN CTT AND INDIVIDUAL COUNTRIES' NBTT

The problem identified in the previous section is that, while the overall commodity terms of trade may be a useful measure of average movements in the relative price of primary commodities, they may not be a good measure of a given country's NBTT. Here I want to examine the degree of closeness between the two types of terms of trade series for 66 non-oil developing countries. One assumption made throughout the empirical analysis is that CTT is an exogenous variable from the point of view of an individual country. This assumption is fairly innocent, given the extremely aggregate nature of CTT (as discussed above), and allows us to use CTT as the explanatory variable in the regression analysis to follow, although it may be better to refer to *association* rather than unidirectional *causality* to describe the nature of the estimated relationships. In log–linear form the basic regression model is

$$\text{nbtt}_t = \beta_0 + \beta_1 \text{ctt}_t + \beta_2 \text{po}_t + \varepsilon_t \qquad (1)$$

where lower case letters indicate the natural logarithm of the corresponding variable, i.e. nbtt = ln NBTT, β_0, β_1 and β_2 are parameters to be estimated, and po_t is (the logarithm) of the price of oil (in US dollars). The oil price is included in some of the specifications to capture the particularly large swings in commodity prices associated with the oil price shocks of the 1970s and early 1980s, and to make the current analysis comparable to previous results.

Since the data analysed here are hypothesized to be non-stationary and we are interested in long-run relationships, I will use the cointegration approach. Two non-stationary series, x_t and y_t are said to be cointegrated if there exists a linear combination of the two series which is integrated of a lower order than the series themselves. This definition extends readily to the case of more than two variables. Preliminary unit root tests (not reported here) of the (logarithms of the) individual NBTT series reveal these to be integrated of order one, with few exceptions.[7] The same is the case for the various CTT series used and the oil price series.

Thus, if the series are cointegrated, we would expect the cointegrating relationship to be stationary. Since the issue of interest is the existence of a stationary linear combination, the basic cointegration approach suggested by Engle and Granger (1987) will be used. This involves the estimation of equation (1) by OLS (ordinary least squares) which, if the variables are cointegrated, provides superconsistent estimates of the parameters. To test for cointegration, I use the ADF(1) statistic[8] to test whether the series of estimated residuals in equation (1), $\hat{\varepsilon}_t$, is stationary. Since ADF type unit root tests are not very powerful in relatively small samples such as

[7] On the basis of ADF(1) tests with a constant. If a time trend is included, a considerable number of NBTT series reject the unit root hypothesis in favour of a linear deterministic trend.

[8] An examination of the significance of the included lagged differences of higher order revealed that ADF(1) was sufficient throughout.

ours, a 10 per cent significance level will be employed, which is more favourable towards the alternative hypothesis of stationarity than the 5 per cent level. For 34 observations, the critical values are −3.14 (two variable case, i.e. without the oil price) and −3.64 (three variable case) as generated by the T.S.P. Econometrics package on the basis of MacKinnon (1994). If asymptotic distributions are used, i.e. without small-sample adjustment, the corresponding values are −3.04 and −3.45.

Estimates of equation (1) and tests of cointegration using the IMF aggregate developing country NBTT series have already been presented in the past. Powell (1991) obtains the following estimates for the 1953–86 period:

$$\begin{aligned} \text{aggregate nbtt}_t &= 0.19 + 0.290\ \text{ctt}_t - 0.047\ \text{po}_t \\ \text{EG-ADF(1)} &= -3.42 \qquad (t = 1953, \ldots, 1986). \end{aligned} \qquad (2)$$

Bleaney and Greenaway (1993) obtain very similar elasticities[9] for a slightly later sample period, 1955–89.

$$\begin{aligned} \text{aggregate nbtt}_t &= 4.47 + 0.289\ \text{ctt}_t - 0.080\ \text{po}_t \\ \text{EG-ADF(1)} &= -3.94 \qquad (t = 1955, \ldots, 1989). \end{aligned} \qquad (3)$$

In Powell's case, the EG-ADF (Engle–Granger ADF) statistic is marginally insignificant. In Bleaney and Greenaway's case it is significant suggesting that the variables are cointegrated. The estimated elasticities suggest that a one percentage point decline in the non-fuel commodity terms of trade is associated with a 0.29 percentage point reduction in the aggregate NBTT of non-fuel developing countries. For sake of comparison, I have created an aggregate NBTT series for the 66 countries in the current sample, averaging the country indices before taking logarithms. The resulting estimate of equation (1) is

$$\begin{aligned} \text{aggregate nbtt}_t &= 5.07 + 0.528\ \text{ctt}_t - 0.039\ \text{po}_t \\ \text{EG-ADF(1)} &= -3.83 \qquad (t = 1960, \ldots, 1993). \end{aligned} \qquad (4)$$

The EG-ADF statistic is significant at the ten per cent level. The estimated elasticity of NBTT with respect to CTT is considerably larger than the earlier estimates by Powell, and Bleaney and Greenaway, suggesting that more than half of all changes in the commodity terms of trade are on average transmitted in the long run to the terms of trade of the countries in the sample. However, this is again an aggregate picture and does not really throw light on the question of interest, i.e. to what extent changes in individual LDCs' NBTT are associated with changes in the overall CTT.

To answer this question, equation (1) was re-estimated four times for all 66 countries in the current sample. The four versions differ in terms of the ctt_t variable used. The latter consist of the four commodity price series in Grilli and Yang (1988): 'overall non-fuel commodities', 'food', 'non-food agricultural products' and 'metals'. Table 3 provides an overview of the number of significant cointegrating vectors in the sample for each CTT index. The first noteworthy feature is that the inclusion of oil prices raises that number considerably. The number of cointegrating vectors ranges from seven (metals) to 24 (overall and food), corresponding to 11 and 36 per cent of the total number of countries, respectively. Moreover, if one were to use asymptotic

[9] So do Grilli and Yang (1988) in their earlier paper.

Table 3. Number of cointegrating relationships by commodity price series. Notes: the first column refers to the price series used in the numerator of the commodity terms of trade. The numbers in parentheses give the number of rejections if asymptotic critical values are used.

Commodity price series in numerator	With oil price		Without oil price
Overall	24 (32)	→ 36%	14 (16)
Food	24 (32)	→ 36%	16 (16)
Non-food agriculture	15 (21)	→ 23%	7 (8)
Metals	7 (9)	→ 11%	4 (1)

Table 4. Number of countries with at least one cointegrating relationships. Notes: the first column refers to the price series used in the numerator of the commodity terms of trade. The numbers in brackets give the total number of countries in each group.

Total	35 (66)	→ 53%
Region		
Africa	14 (30)	→ 47%
Latin America	12 (23)	→ 52%
Asia	9 (13)	→ 69%
Income per capita		
Low	11 (22)	→ 50%
Medium	14 (22)	→ 64%
High	10 (22)	→ 45%

critical values, the number of cointegrating relationships would rise by around a third. The corresponding numbers (i.e. using asymptotic critical values) are indicated in parentheses.

However, due to the diversity of countries in the sample it is unlikely that any one particular index (of the four GY indices) would capture each individual country's NBTT. So the more appropriate question to ask is for how many countries one finds at least one cointegrating relationship between NBTT and CTT indices, with or without inclusion of the oil price variable. Table 4 shows this information. Overall, there is at least one significant cointegrating relationship for more than half the countries. Geographically, there are some differences, with the lowest percentage for the African subset of countries. This must be considered somewhat surprising, since these are the countries which are, on average, most reliant on primary commodity exports (see Table 2). The closest association between CTT and NBTT can be found among the Asian countries. In terms of income per capita, the highest number is found for the medium income countries, the lowest for the wealthiest countries in the sample.

Of particular interest are the estimates of the elasticity of country level NBTT with respect to the overall CTT indices. In Table 5, one finds the estimated elasticities for those 35 countries with at least one cointegrating relationship. For several countries, the NBTT forms a stationary relationship in more than one case (out of eight possible, since there are four CTT indices and two specifications, one with and one without the oil price), so several elasticities could be provided. It was therefore decided to first of all concentrate on the results with the overall CTT and oil price on

Table 5. Estimated elasticities (for cointegrated series).

Country	β_1	Comments	Country	β_1	Comments
Afghanistan	0.23		Malaysia	0.67	non-food agric.
Argentina	0.86		Mali	−0.08	
Bangladesh	0.24		Mauritania	0.40	non-food agric.
Barbados	0.94		Morocco	0.09	
Benin	0.48		Mozamb.	0.05	non-food agric., no oil P
Chad	−0.20	non-food agric.	Nicaragua	0.82	
Dom. Republic	0.64		Pakistan	0.61	
Ecuador	0.25		Panama	0.46	Metals
El Salvador	0.76		Paraguay	0.36	
Ethiopia	1.30	no oil P	Philippines	0.49	Metals
Gambia, The	0.66		Reunion	0.89	
Ghana	0.66	food, no oil P	Rwanda	1.00	
Guatemala	0.61		Sri Lanka	0.66	no oil P
Guyana	0.72		Thailand	0.51	non-food agric.
Jamaica	0.31		Togo	1.05	Food
Jordan	0.53		Tunisia	0.16	
Liberia	0.24		Uruguay	0.36	
Malawi	0.36				
			Mean	*0.518*	

the right hand side of equation (1). This provides 24 estimated elasticities. For the remaining 11 countries, I first considered the results with overall CTT but no oil price in the equation. If a significant cointegrating relationship was found in that case, the reported elasticity is marked with the comment 'no oil P' in Table 5. There are two such cases, Ethiopia and Sri Lanka. Should there be no evidence of cointegration with the overall CTT, the more specialized CTT regressions are considered. For those entries there is a comment indicating for which category of primary products one finds a cointegrating relationship. There are two cases for the food and metals CTT each, and five for the non-food agricultural products CTT.

If one takes the mean of all the country specific elasticities shown in Table 5, one obtains a value very similar to that obtained for the aggregate NBTT in equation (4), i.e. 0.518 compared with 0.528. However, the country-specific elasticities provide a lot of additional information. They demonstrate that the aggregation process masks the degree of variation with respect to the influence of the overall CTT on country level terms of trade. The estimated elasticities range from −0.20 (Chad) to 1.30 (Ethiopia). Only nine of the 35 are within a 50 per cent margin around the previous point estimates of Powell (1991) and Bleaney and Greenaway (1993). For a number of countries, i.e. Argentina, Barbados, Reunion, Rwanda and Togo, the two series move almost one for one in the long run. Ethiopia even appears to suffer from a long-run NBTT decline in excess of the overall CTT.

4 CONCLUDING COMMENTS

This paper has examined the statistical relationship between the overall commodity terms of trade indices developed by Grilli and Yang (1988) and the net barter terms of trade of 66 non-oil developing countries. This link in the debate about the long-term downward trend in the terms of trade, first postulated by Prebisch (1950) and Singer

(1950), has largely been neglected in the literature. Barro (1997) establishes a significant negative link between changes in a country's NBTT and economic growth; Lutz (1999) provides strong evidence for the downward trend in the overall CTT. Here we have addressed the question to what extent movements in a given country's NBTT can be linked to movements in the CTT. If there is a clear link, then Barro's findings suggest that trends in the overall CTT need to be taken seriously.

The paper highlighted two reasons why one may not expect there to be a significant relationship between the two. First, it was shown that the composition of developing country exports has changed substantially during the post-war period. Here we saw that, even over the relatively short period between 1970 and 1990, the share of manufacturing exports nearly doubled, whereas the share of primary exports declined by a third. Second, the heterogeneity between countries was highlighted. It must therefore come as somewhat of a surprise that for more than half the countries a significant relationship between NBTT and overall CTT could be detected. Illustrating further how heterogeneous developing countries are, the responsiveness of the country terms of trade to the overall index was found to vary considerably between countries. Overall, the findings suggest that the long-term trend in the overall terms of trade is still relevant to developing countries today.

ACKNOWLEDGEMENTS

An earlier version of this paper was presented at a conference at the University of Innsbruck, 10 October 1997, to celebrate the presentation of the *Honorary Doctorate* of the University of Innsbruck to Sir Hans Singer. Comments and suggestions from conference participants proved very useful: all remaining errors are mine.

REFERENCES

Aizenman, J. (1997). 'Entwicklungsländer: Wachstumsursachen — Wachstumshindernisse'. In von Hagen, *et al* (ed.) *Handbuch der Volkswirtschaftslehre: Wirtschaftspolitik und Weltwirtschaft*. Berlin: Springer, pp. 407–442.

Barro, R. (1997). *Determinants of Economic Growth*. Cambridge, MA: MIT Press.

Bleaney, M. and Greenaway, D. (1993). 'Long-run trends in the relative price of primary commodities and in the terms of trade of developing countries', *Oxford Economic Papers*, **45**, 349–363.

Engle, R. and Granger, C. (1987). 'Co-integration and error correction: representation, estimation, and testing', *Econometrica*, **55**, 251–276.

Grilli, E. and Yang, M. C. (1988). 'Primary commodity prices, manufactured goods prices, and the terms of trade of developing countries: what the long run shows', *World Bank Economic Review*, **2**(1), 1–47.

International Monetary Fund *International Financial Statistics*. Washington, DC: International Monetary Fund (various dates) (various issues and CD-Rom).

International Monetary Fund (1995). *IMF Survey*. Washington, DC: International Monetary Fund.

Lutz, M. (1999). 'A general test of the Prebisch-Singer hypothesis', *Review of Development Economics*, **3**(1), 44–57.

MacKinnon, J. (1994). 'Asymptotic distribution functions for unit-root and cointegration tests', *Journal of Business and Economics Statistics*, **12**, 167–176.

Nafziger, E. W. (1997). *The Economics of Developing Countries*, (2nd ed.). New Jersey: Prentice-Hall International.

Newbold, P. and Vougas, D. (1996). 'Drift in the relative price of primary commodities: a case where we care about unit roots', *Applied Economics*, **28**, 653–661.

Powell, A. (1991). 'Commodity and developing country terms of trade: what does the long run show?', *Economic Journal*, **101**, 1485–1496.

Prebisch, R. (1950). *The Economic Development of Latin America and its Principal Problems*. New York: United Nations.

Sapsford, D. and Balasubramanyam, V. N. (1994). 'The long-run behaviour of the relative price of primary commodities: statistical evidence and policy implications', *World Development*, **22**, 1737–1746.

Singer, H. W. (1950). 'The distribution of gains between investing and borrowing countries', *American Economic Review, Papers and Proceedings*, **11**, 473–485.

Singer, H. W. (1991). 'Terms of trade: new wine and new bottles?', *Development Policy Review*, **9**, 339–351.

World Bank (1995). *World Data 1995 — World Bank Indicators on CD-Rom*. Washington, DC: World Bank.

World Bank (1997). *World Development Indicators 1997* (on CD-Rom). Washington, DC: World Bank.

DATA APPENDIX

CTT: The data up to 1986 is from Grilli and Yang (1988) which can be consulted for a more a detailed description. The overall commodity price index is a weighted average of the prices of food products, non-food agricultural raw materials and metals. The manufactured goods price index, pm_t, is based on export unit values of industrial countries (MUV in Grilli and Yang). For the remainder, data for the primary commodity price indices comes from the IMF's *International Financial Statistics*, and for manufacturing prices from the United Nations *Monthly Bulletin of Statistics*.

NBTT: World Bank: *World Data 1995* (on CD-Rom).

Export Structure: World Bank: *World Development Indicators 1997* (on CD-Rom).

Oil Price: IMF: *International Financial Statistics*.

Sample Selection: The selection of the sample proceeded on the basis of data availability. Of all the developing countries selected, the major fuel and minerals exporters were then excluded from the sample. The criterion here was if the average share of these items in total merchandise exports exceeded fifty per cent. For some of the more ambiguous countries, I proceeded as follows: on the one hand, Cyprus, Greece, Israel and Spain were not included in the sample, although they may be called semi-industrialized countries (during the sample period); on the other hand, the French dependencies of Martinique, Guadeloupe and Reunion were included. This leaves a sample comprising 66 countries.

