

Exports and Economic Growth in Namibia, 1968-1992

by

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This short paper analyzes Namibia's data from 1968-1992 in order to determine the role of exports in economic growth. The analysis confirms the general importance of exports, but finds no discernible sign of accelerated growth. There is some evidence supporting the political economist's hypothesis about declining terms of trade due to external demand-side factors. Even so, Namibia seems to represent a vent-for-surplus example in which resource rents do neither sustain early, nor stimulate new, economic growth. An important finding is that domestic export supply factors are more important to growth than external demand factors.

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0. INTRODUCTION

Prior to 1980 Namibia grew relatively fast, but thereafter economic growth has greatly slowed, leaving no real growth to speak of during the entire 1968-1992 decade. The difference between the two periods is that before 1980 production focused on primary commodities for export, viz., minerals, with the trade surplus gains going into expanding the productivity of the traded primary goods sectors. To avoid the effects of UN-sponsored economic sanctions against Apartheid policies in that country, South Africa (which then controlled Namibia) attempted to incubate manufacturing and the non-traded secondary and tertiary sectors started to eat away at the gains from trade leading to weak economic performance. As it often happens, policy-makers took cover behind the old Prebisch blame that the primary sector overspecializes in the production and export of raw materials.

The theoretical basis for a positive correlation alleged between foreign trade and economic growth goes back to the role Adam Smith (1937) assigned to trade as a vent-for-surplus method for extending domestic markets, and was popularized by the success of Asian newly industrializing countries in the 1980s and 1990s (see Irwin, 1996).¹ To Smith's vent-for-surplus model David Ricardo

¹ According to Smith vent-for-surplus externalities are side-effects of trade which "give a value [to] superfluities, by exchanging them for something else, which may satisfy a part of [traders'] wants and increase their enjoyment, [and thus reducing

latter added that export-led growth is abetted by differential labor productivity (Chaudhuri, 1989). However, the trade effects on the economic growth of developing countries were essentially ignored until studies sparked by Nurkse's (1961) claim that "trade as an engine of growth" was *passé*, began to incorporate exports in an augmented production function along with capital and labor (see Kindleberger, 1962; Caves, 1965; Corden, 1971; Choi, 1983; Thirlwall, 1982). Incorporating exports double-counts exports, and introduces a misspecification error; as flows exports are part of output; as stocks they are part of capital.

The good thing that came out of the misspecification mentioned above was that it justified the search for less troubled expressions of the export-economic growth nexus, and led to many time-series, cross-sectional, and pooled data studies, among many Emery (1967), Syron and Welsh (1968), Sheehey (1995), Balassa, (1978), and Feder (1983). All, but Balassa and Feder, had assumed exports to be a cause and economic growth its positive effect. Balassa and Feder recognized the problems posed by the issue of joint determination of exports and output. From this recognition Salvatore (1983), Salvatore and Hatcher (1991), Sprout and Weaver (1993) have attempted to accommodate the simultaneous association among income (output), capital, and exports. Like others, however,

the] narrowness of the home market [that tends] to hinder a division of labor." (From Thirlwall, 1982, p. 338, [] added).

the functional forms they utilized remain open to the specification bias and the double counting misspecification error just mentioned. To-date a great deal of *ad hoc* evidence still supports skepticism over the tests of export (x)-led growth (Kravis, 1970; Kanamori, 1968), leaving enough room for an additional analysis.

1. ECONOMIC GROWTH AND TRADE IN NAMIBIA

In order to minimize the misspecification error output growth and labor productivity growth used here as measures of economic growth were estimated separately (see Amavilah, 1996; Amavilah and Newcomb, 1996). In one instance, output growth (\dot{Y}_{it}) was estimated as a function of the growth of labor (\dot{L}_{it}), capital (\dot{K}_{it}), and some sector-specific measure of technical change (T_i), in another instance output was assumed to be a function of capital, technical change (T_i), skilled (\dot{H}_{it}) labor, and unskilled (\dot{L}_{it}^*) labor, in the second instance, i.e.,

$$\begin{aligned}\dot{Y}_{it} &= f(\dot{L}_{it}, \dot{K}_{it}, T_i) \\ \dot{Y}_{it} &= f(\dot{H}_{it}, \dot{L}_{it}^*, \dot{K}_{it}, T_i)\end{aligned}\tag{1}$$

In that case (1) is the output growth measure of economic growth. An alternative measure of economic growth used was the annual average labor productivity (\dot{y}_t) as,

$$\begin{aligned}\dot{y}_{it} &= f(\dot{k}_{it}, T_i) \\ \dot{y}_{it} &= f(\dot{k}_{it}, \dot{h}_{it},\end{aligned}\tag{2}$$

The dot over a variable indicates its growth rate over time.

1.1. Output-Export Growth Correlations

Like in previous research this analysis infers the role of exports in economic growth from the association between output growth and trade openness as,

$$\dot{Y}_{it} = \pi_i \dot{x}_{it}, \quad (3)$$

where π_i is the income elasticity of export growth over time t , x_{it} is for export, i is for the i^{th} export type or origin of the exports. While (3) is consistent with judging the merit of exports by noting the correlations between export growth and output growth, it does not suffer the double counting problem because (1) and (2) were estimated separately, not as direct determinants of an export-augmented production function approach (Fosu, 1996). In other other words, output growth depends on the growth of traditional inputs, but it is accelerated (decelerated) by the growth of exports.

1.2. Labor Productivity Versus Exports

Instead of depending on export growth labor productivity is affected by the volume of exports. The relationship between labor productivity and export volume is rich: it does not just say something about the productivities of the exporting sectors, and the openness of the trade regime itself, it also says something

about the welfare implications of foreign trade. Formally, changes in the growth of average labor product depends on increases in the volume of exports,

$$\dot{y}_{it} = \omega_i x_{it}, \quad (4)$$

where ω_i is the productivity elasticity of exports. The subscript i stands for 1 if primary exports, 11 if primary mineral exports, 12 if primary agricultural and fish exports, 2 if secondary exports, and 21 if manufacturing exports. Within mineral exports x_{d11t} is for diamond exports, x_{u11t} is for uranium exports, and x_{o11t} is for other (non-diamond and non-uranium) mineral exports. This means that whereas (3) is a definitional function (hence double counting), (4) is analytical in which x_{it} may be thought of as a proxy for (foreign) capital stock.

1.3. Factors Determining Export Supply

Once the relationship between exports and economic growth is examined, whatever its nature, it becomes essential to ask what the determinants of export supply are. From theory exports are determined by demand (external) and supply (internal) forces. According to that theory, the demand for Namibian total exports would be a function of own export prices (P_x), competitor's prices (P_w), a measure of the condition of the world market represented by world income (y_w), and export demand-related technical changes (T_{dx}),

$$X_d = f(P_x, P_w, y_w, T_{dx}). \quad (5.1)$$

On the supply side exports depend on export prices, variable costs (C), the ratio of x_{it} to Y_{it} , i.e., $K = x_{it} / Y_{it}$ as a measure of export productive capacity, and supply-related technical changes (T_{sx}),

$$x_s = f(P_x, C, K, T_{sx}) \quad (5.2)$$

Since in equilibrium supply equals demand (small country assumption under competition), (5.1) and (5.2) can be combined into,

$$x_j = e^{\lambda T_{dx}} e^{\lambda T_{sx}} f_w(q_w) f_d(q_d) = e^{\lambda T} f_w(P_w, y_w) f_d(P_x, C, K), \quad (5.3)$$

where $e^{\lambda T} = (e^{\lambda T_{dx}})(e^{\lambda T_{sx}})$ is net trade-related technical change, $f_w(\cdot)$ is a function of foreign factors, q_w , $f_d(\cdot)$ is a function of domestic factors, q_d . Here the world price (P_w) is approximately equal to the exchange-rate weighted domestic import price (P_m), and domestic import price is approximately equal to the general domestic price level (P_d). Now single-deflating (dividing both sides of) (5.3) by P_d one gets,

$$x_j = A e^{\lambda T} y_w^{\phi_1} P^{\phi_2} C^{\delta_1} K^{\delta_2}, \quad (5.4)$$

where P is the ratio of export price to import price index evaluated at the rates of exchange and domestic inflation. Eq. (5.4) is obviously a lame, but useful, cop-out because x_j is now either export demand or export supply depending on the empirical

signs of P, K, and C.

2. ESTIMATIONS AND TESTS

2.1. Output-Export Growth Correlations

Table 1 presents the associations between the growth in gross domestic product and the growth in exports. The results show that exports explain some of the variations in output growth. However,

Table 1 - Aggregate Output Growth and Export Growth²

$$\dot{Y}_{it} = \alpha_i + \beta_i \dot{Y}_{it-i} + \pi_i \dot{x}_{it}$$

Growth of Variable	Model A	Model B	Model C	Model D
CONSTANT	0.87 (2.07)	0.87 (2.47)	0.87 (2.41)	0.73 (2.31)
	1.26 (10.8)	1.26 (2.37)	1.27 (2.47)	1.14 (2.10)
Y-LAGGED	0.59 (12.4)	0.59 (13.3)	0.59 (12.9)	0.63 915.1 0
	0.50 (4.70)	0.49 (5.9)	0.49 (6.0)	0.52 (6.2)
TOTAL	-0.04 (-1.3)			
	0.06 (1.01)			
PRIMARY		-0.002 (-0.1)		
Minerals		0.076 (1.9)		
			0.003 (0.15)	
Diamonds			0.069 (2.01)	-0.01 (-1.0)
				0.04 (1.6)
Uranium				-0.001 (0.3)
Other				0.002 (0.2)

²Parentheses are t-ratios. The second row corresponds to the dependent variable derived from disaggregated labor.

				-0.1 (-2.2)
				-0.1 (-1.1)
Agr. & Fishing			0.002 (0.5)	0.01 (2.15)
			0.006 (0.7)	0.02 (1.2)
MANUFACTURING		-0.03 (-2.1)	-0.03 (-2.1)	-0.04 (-1.3)
		-0.04 (-1.6)	-0.05 (-2.0)	-0.03 (-1.2)
Adj. R ²	0.8718	0.8780	0.8760	0.8935
Adj. R ²	0.4881	0.5737	0.5621	0.4983
DW (ρ)	2.01 (-0.01)	1.98 (0.01)	1.94 (0.03)	2.00 (0.00)
DW (ρ)	1.82 (0.001)	1.73 (0.02)	1.69 (0.04)	1.68 (0.03)

Table 2 - Output-Export Growth Correlations in Namibia, 1969-1992³

Exports	Model A	Model B	Model C	Model D
Total	+n			
Primary		+s		
Minerals			+s	
Diamonds				+n
Uranium				+n
Other				-s
Agriculture	+n		+n	+s
Manufacturing		-s	-s	-n

Table 3 - Export Effects on Productivity in Namibia, 1968-1992⁴

Exports	1968-1992	1968-1980	1981-1992
Total	+ss	+ss	+n
Primary	+n	+s	+n
Minerals	+ss	+ss	-ss
Diamonds	+ss	+n	+n
Uranium	+ss	+ss	-ss
Other minerals	+s	+s	+n

³n/a = not applicable; +s = positive and significant, -s = negative and significant; +n = positive and insignificant; -n = negative and insignificant.

⁴+ss = positive and very significant; +s = positive and significant; +n = positive and insignificant; -ss = negative and very significant; -s = negative and significant; -n = negative and insignificant.

Agriculture	+n	+n	+n
Manufacturing	-s/+s	-s/+n	+n/-n

their impacts are low. Mineral export growth has the expected positive and significant impact on economic growth, while non-mineral primary export growth is statistically nonessential to economic growth. In terms of mineral commodities, the effects of the exports of uranium and other non-diamond and non-uranium minerals remain weak. In fact, the significance of non-mineral primary exports is actually negative in this case. Thus, contrary to the literature for other regions, while export growth plays an obvious role in Namibia's economic performance, it is neither a dominant nor necessarily a positive growth factor.

2.2. Labor Productivity and Exports

In terms of productivity an increase of one percent in total exports leads to a positive but tiny rise in labor productivity, leaving unexplained a large portion of the observed variations in productivity (see Models 1 and 2). Mineral exports are positively associated with labor productivity (Model C). While diamond exports and other primary mineral exports are all statistically essential to productivity during the 25 years, in substance their importance is questionable given low partial coefficients (Model D). For the early years (1968-1980) 85.6% of variations in labor productivity are explained by uranium exports and other primary mineral exports. During the later (1981-1992) years uranium exports have a significantly negative effect on labor

productivity, while diamond and other primary mineral exports are weakly positive. Whichever period one looks at manufactured exports have either had a zero or negative influence on the Namibian economy. These findings clearly reflect the falling uranium price and output since 1983, and diamond price weakness during 1980's. Just as clearly they suggest that exports are a necessary but not sufficient condition for economic growth.

2.3. Export Volume Determination

Table 2 summarizes the results of (5.4).⁵ With respect to total exports, the effects of export market conditions such as foreign income and domestic export capacity are negative. The latter means that investment in the export sector has declined over the 1968-1992 years; the former reflects weak mineral markets in developed countries as noted by (Roberts, 1988). World demand conditions, export prices, and technical change have favored primary exports. Variable costs and export capacity have statistically zero effects on labor productivity. On the brighter side of things though, despite economic recession in the industrialized countries, Namibian primary exports held their own. That is not surprising given that a large part of primary exports is mineral exports for which both technical change and

⁵ Those interested in numerical magnitudes of estimated coefficients are referred to Amavilah (1996, Chapter 5), and/or Amavilah and Newcomb (1996, Table 3, p. 23, and Table 4, p24).

capacity building were already in place and the world state of the mineral economy as well as export prices were favorable. The variable costs in the mineral sub-

Table 4 - Export Supply Results in Namibia, 1968-1992⁶

$$\ln x_j = \alpha + \lambda T + \phi_1 \ln y_w + \phi_2 \ln P + \delta_1 \ln C + \delta_2 \ln K$$

Variable	$\ln x_t$	$\ln x_{1t}$	$\ln x_{11t}$	$\ln x_{21t} = \ln x_{2t}$
Intercept	-8.5 (-11.2)	-90.6 (-2.7)	0.6 (0.3)	-171 (-2.2)
$\ln y_w$	-0.1 (-1.1)	0.4 (1.6)	0.3 (1.5)	-0.5 (-1.5)
$\ln K$	-8.5 (-4.7)	-	-	-
$\ln P$	-	-	0.4 (3.1)	1.4 (1.1)
$\ln C$	-	0.5 (2.3)	-	-13.2 (-2.1)
T_{ex}	-	0.48 (2.86)	4.56 (4.29)	0.09 (2.34)
Adj. R^2	0.5017	0.4184	0.5794	0.5744
σ^2	0.0066	0.0164	0.0191	0.0397
DW	1.7213	1.698	1.625	1.498
ρ	0.128	0.136	0.169	0.245
N	24	24	24	24
χ^2 (df)	1.881 (1)	1.716 (4)	3.316 (4)	3.028 (3)
Mean x_{it}	6.9416	6.7511	6.5273	5.1347

⁶ Parentheses T-ratios, - = not applicable

sector were the most important constraint of export supply, which is understandable given the energy costs of the mid-1970s.

3. IMPLICATIONS AND CONCLUSIONS

3.1. Output Growth Versus Export Growth

An increase in the growth of exports resulted in a modest rise in the rate of output growth in the short-run and doubles in the long-run (Cf. Motinga, 2001). In that case the significance of manufacturing and nonmineral primary exports was almost nil (see Table 2). Table 3 indicates that exports were important to labor productivity in Namibia, especially in the first decade (1968-1980). However, after 1980 export effects on labor productivity slowed. In fact, export volume did worse in explaining economic growth measured as labor productivity than export growth.

The results clearly indicates that domestic supply factors were by far more important growth factors in Namibia than foreign demand factors. An important implication of the results is that countries like Namibia stand to gain little or nothing from blaming "foreigners" for their poor performance. Admittedly this short paper excluded other factors which are known to be also important to demand for and supply of exports such as tastes and preferences, as well as government policies (see Weder, 1996).

Nonetheless, it is clear from the data that a small growth trend in gross domestic product and average labor productivity in Namibia during 1968-1992 years breaks down to significant positive growth rates pre-1980 followed by a significant decline and stagnation after 1980. It seems that the shift away from emphasis on the leading primary sector towards an infant manufacturing industry did not result in increased factor productivities, and evidenced serious technical inefficiencies, in addition to the fall in the terms of trade.

A concluding implication is that exports are a necessary but not a sufficient condition for either output growth or labor productivity. Given the current conditions, Namibia cannot realistically expect rapid growth, unless domestic factor productivities return to their pre-1980 levels as export supply is largely a function of domestic factors and forces.

APPENDIX

Data

The data were drawn from a number of sources among them: G.M.E. Leister (1971), UNIDO (1990), and World Bank (1992). Useful background information also came from **various** Economist Intelligence Unit's *Country Profiles* and *Reports*,

IMF/International Financial Statistics Yearbooks, World Bank's *World Development Reports*, and *Country Tables*, the central Bank of Namibia, and *National Accounts Statistics*. Where appropriate and possible data was treated according to the guidelines of the revised *System of National Accounts* (SNA, 1993). All relevant variables were "single-deflated" using the consumer price index, a poor but only consistent deflator available for Namibia (see Stone, 1992; Amavilah, 1996). Even so, the quality of the available data remains open to the incumbent aggregation problems and measurement errors common to developing countries.

Table A.1 - Variable Definitions

Variable	Variable Definition
Y	real national product = GDP, Million 1980 N\$
x_i	real export value from ith exporting sector, Million 1980 N\$
m_i	real import from the ith importing sector, Million 1980 N\$
P_i	price of the ith export, $i = \text{export, import, domestic,}$
P	relative prices = P_x/P_m
C	variable costs, proxied by capital-labor ratio

K	export capacity, proxied by output of ith sector to total output
T _i	dummy variable for technical change

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