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A New Interpretation of Kaldor's First Growth Law for Open Developing Economies

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Abstract

Kaldor's first law of growth posits a positive causal relation between the growth of manufacturing output and the growth of GDP due to static and dynamic returns to scale in manufacturing and rising productivity outside the manufacturing sector as resources are transferred from diminishing returns activities. In an open economy, however, the Kaldor first law of growth is open to another interpretation because it is apparent across countries that there is a close association between manufacturing output growth and export growth, and between export growth and GDP growth. Results are presented for 89 developing countries over the period 1990-2011, also distinguishing between low income, lower-middle income and upper-middle income countries, and between the continents of Africa, Asia and Latin America.

Key Words: Kaldor's growth laws; manufacturing growth; export growth; and, GDP growth.

JEL Code: C21, E12, F43

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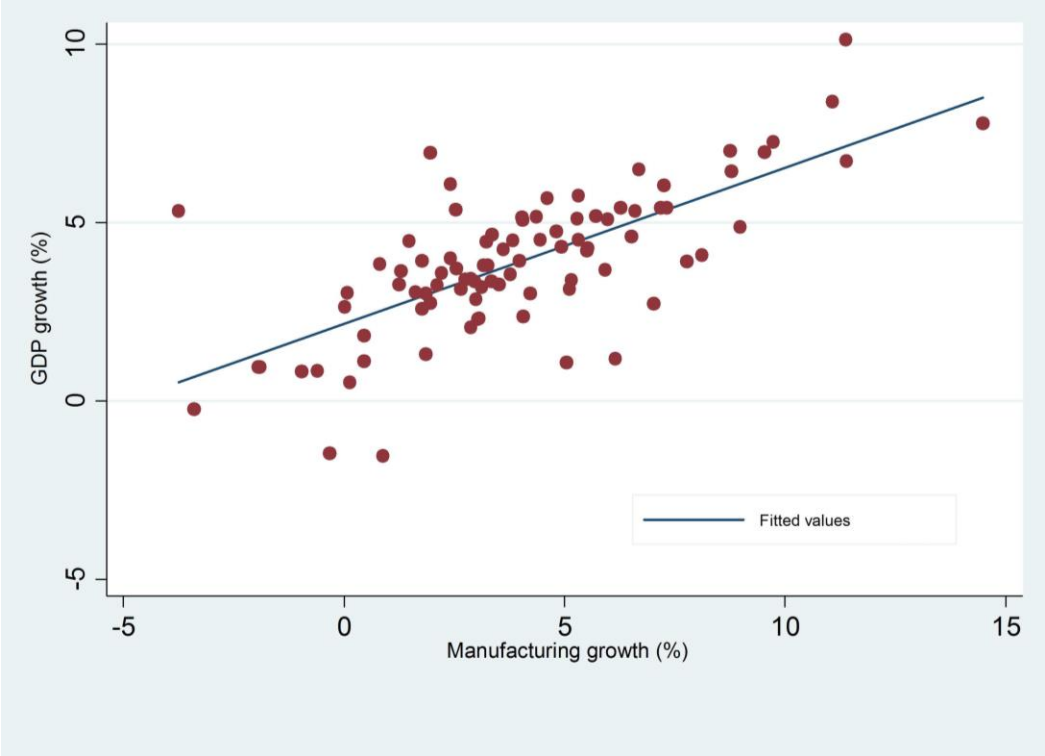
Introduction

It is now well established in the growth and development literature that there is a strong causal relation between the growth of manufacturing output and the growth of GDP. This is shown not only by direct tests of the relationship, but also by side-tests (to avoid the charge of spuriousness) which relate the growth of GDP to the *excess* of manufacturing output growth over non-manufacturing output growth, or the growth of non-manufacturing as a function of the growth of manufacturing output (for a survey, see Thirlwall, 2011, 2013). Manufacturing is the engine of growth. The fastest growing countries in the world today are the so-called newly industrializing countries where the share of manufacturing output in GDP is rising the most rapidly. This link between the growth of manufacturing output and the growth of GDP is sometimes referred to as Kaldor's first growth law after Nicholas Kaldor (1966, 1967) first put forward his structural theory of why growth rates differ between countries. According to Kaldor manufacturing has characteristics which make it the engine of growth for two main reasons. Firstly, manufacturing itself is subject to increasing returns, both static and dynamic, while land-based activities and petty services are subject to diminishing returns. Secondly, as the manufacturing sector expands, and draws labour from other sectors where there are diminishing returns, productivity in these activities rises automatically because the average product of labour is above the marginal product. Thus, the faster manufacturing output grows, the faster the growth of productivity in the economy as a whole, which is the major source of GDP growth and living standards.

As far as developing countries are concerned, the strong link between manufacturing output growth and GDP growth is shown in Figure 1 for a sample of 89 developing countries over the period 1990-2011.[1]

[1] The countries taken, together with data on export growth, GDP growth and manufacturing output growth, are shown in Table A1 of the Appendix. Countries were chosen on the basis of data availability for a minimum of twenty years.

Figure 1. GDP growth and manufacturing growth, 1990-2011 (89 country averages)



Kaldor's theory is a plausible one, but there are at least three major issues that need discussion. First, what drives manufacturing output growth in the first place? Second, where is the demand for output in the story? Third, the model is essentially "closed-economy'. There is no foreign trade; there is no balance of payments or foreign exchange constraint. There is a fairly easy answer to the first question which Kaldor (1996) himself discusses, namely that in the early stages of development, the major source of demand for manufacturing output must be the dominant agricultural sector, but in the later stages of development, export growth will take over. But the two other issues remain.

The purpose of this paper is to suggest, and empirically test across a wide sample of developing countries from different continents, the proposition that Kaldor's first growth law as it stands can also be considered as a reduced form of two structural relations which embody the missing considerations mentioned above, namely that ultimately in an open economy, GDP growth is governed by export growth, and export growth itself is a positive function of manufacturing output growth because of the favourable demand

characteristics that manufactured goods have in world trade; specifically their higher income elasticity of demand in world markets than other commodities (primary and tertiary). In other words (in linear form) if:

$$g_{GDP} = a_1 + b_1(x) \quad (1)$$

where g is the growth of GDP and x is the growth of total exports, and

$$x = a_2 + b_2\,(g_m) \quad (2)$$

where g_m is the growth of manufacturing output, then substituting (2) into (1) gives:

$$g_{GDP} = a_1 + a_2b_1 + b_1b_2\,(g_m) \quad (3)$$

or

$$g = a + b(g_m) \quad (4)$$

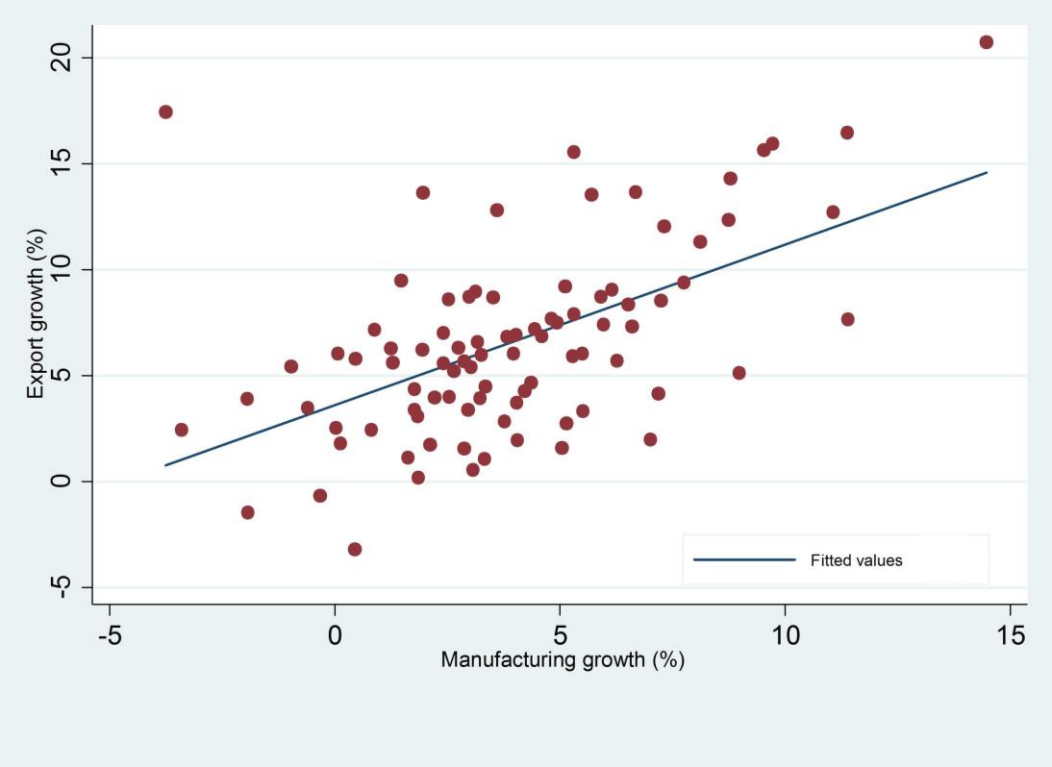
where $a = (a_1 + a_2b_1)$ and $b = b_1b_2$.

This is Kaldor's first growth law, but now the interpretation is different. The extent to which manufacturing output growth promotes a faster growth of GDP depends on the impact of manufacturing output growth on total export growth (b_2) and the extent to which export growth governs output growth (b_1) –sometimes called the dynamic Harrod trade multiplier result (see McCombie and Thirlwall, 1994, 2002; Thirlwall, 2011).

The Link Between Manufacturing Growth and Export Growth

There is strong evidence across developing countries that the dynamism of countries' exports is closely related to the growth of their manufacturing sector. A scatter diagram of the two variables across 89 developing countries over the period 1990-2011 is given in Figure 2.

Figure 2. Export growth and manufacturing growth, 1990-2011 (89 country averages)

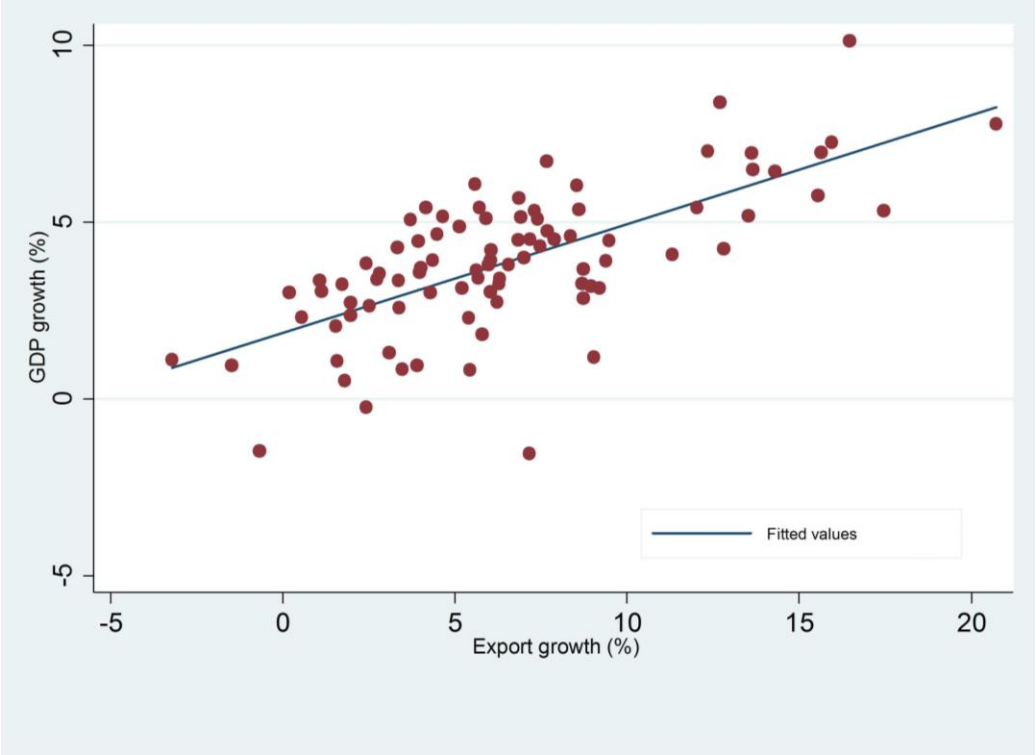


The strong positive link should occasion no surprise. For any given growth of world income, the growth of exports will depend on the structure of production and the income elasticity of demand for different products. Export growth is endogenous in this sense and is likely to be related to the growth of manufacturing output since all manufactures are potentially tradable. Domestic producers of manufactures deliberately promote exports to increase the total size of their market to reap economies of scale. Primary products are potentially tradable, but they do not have the same production and demand characteristics. Their demand growth in international trade is low (Engel's Law). Some services are tradable, but many are not, and their income elasticity in world markets is not likely to be as high as for medium to high-technology manufactured goods.

The Link Between Export Growth and GDP Growth

There is a strong link across countries between the growth of exports and the growth of GDP. A scatter diagram across the same 89 developing countries as before over the period 1990-2011 is given in Figure 3.

Figure 3. GDP growth and export growth, 1990-2011 (89 country averages)



There are three major reasons for expecting *a priori* such a close link. First there is the neoclassical supply-side argument (Feder, 1983) which focuses on the static and dynamic gains from trade and particularly on the externalities that the export sector can confer on the non-export sector and the rest of the economy. Exports also allow the import of inputs and investment goods which may be more productive than domestic resources, thus increasing the supply capacity of an economy. Secondly, if domestic demand is constrained by a shortage of foreign exchange, faster export growth will help to relax the constraint. All components of demand have an import content which needs to be paid for, and only exports can do so. Exports are a unique component of demand in this respect (McCombie, 1985). Thirdly, export growth may set off a virtuous circle of growth

whereby growth caused by exports has positive feedback effects on exports themselves arising from induced productivity growth (Verdoorn's Law). This is the idea of 'circular and cumulative causation' first articulated by Myrdal (1957); later taken up by Kaldor (1970), and formally modeled by Dixon and Thirlwall (1975).

Empirical Estimation

Now let us turn to the empirical estimation of the hypothesis that Kaldor's first law can be considered as a reduced form of the two structural equations specified earlier: $g = a_1 + b_1 (x)$ and $x = a_2 + b_2 (g_m)$. To decompose the reduced form coefficient (b) in equation (4) into its two structural components (b_1 b_2) we first estimate equation (2) by ordinary least squares (since g_m is exogenous) and then estimate equation (1) by two-stage least squares (since x is endogenous) using the predicted x ($\hat{x}$) from equation 2.[2] By this procedure, the decomposition is exact.

The results for all developing countries and countries grouped by income level are shown in Table 1. Focusing first on the all-country sample, we see that the Kaldor first law is supported; there is a strong relation between the growth of manufacturing and the growth of GDP –but none of the tests for functional form, heteroskedasticity and normality of residuals are met. This is the result of the distorting effect of oil producing countries which have grown fast, but have a weak manufacturing sector. When sixteen oil producers are excluded from the sample, it can be seen from Table 2 that all the diagnostic tests are now met. The regression coefficient of GDP on manufacturing output growth is 0.48. The Kaldor explanation is static and dynamic returns to scale and induced productivity growth outside of manufacturing as surplus labour moves into industry. But the alternative hypothesis suggested here is also strongly supported. It can be seen from Table 2 where all the diagnostics tests are met that there is a strong relation between manufacturing output growth and export growth with an elasticity of 0.91, and a strong relation between the growth of GDP and export growth with a coefficient of 0.52. The

[2] The two-stage least squares estimate of equation (3) gives the same r^2 and test statistics as equation (1) because, since g_m is the only autonomous variable in the system, the predicted x($\hat{x}$) from equation (2), used as an instrument in equation (1), is perfectly correlated with g_m. But, of course, the coefficient estimates of x and g_m in equations (1) and (3) are different.

product of b_1 and b_2 gives the relation between manufacturing output growth and GDP growth. The biggest impact comes from the strong effect that manufacturing output growth has an export performance.

Table 1. Equations by income level

Dependent variable	Constant	Independent variable	R^2	Diagnostic tests	Breusch-Pegan/Cook-Weisberg test[1]	Shapiro-Wilk test[2]	Ramsey RESET test[3]
Developing countries							
gdp	2.16 (9.07)*	0.43 g_m (9.43)*	0.50		4.88 (0.027)	0.95 (0.002)	**0.60 (0.615)**
x	3.59 (5.70)*	0.75 g_m (6.19)*	0.30		4.39 (0.036)	0.94 (0.000)	5.69 (0.001)
gdp (2SLS)	0.09 (0.21)	0.57 x (9.43)*	0.50		4.88 (0.027)	0.95 (0.002)	**0.60 (0.615)**
Low income							
gdp	2.06 (7.27)*	0.48 g_m (10.22)*	0.80		**0.83 (0.360)**	**0.97 (0.762)**	**0.91 (0.451)**
x	2.55 (2.46)*	1.05 g_m (6.13)*	0.59		**0.12 (0.724)**	**0.96 (0.474)**	**0.58 (0.635)**
gdp (2SLS)	0.89 (2.39)*	0.45x (10.22)*	0.80		**0.83 (0.360)**	**0.97 (0.762)**	**0.91 (0.451)**
Lower-middle income							
gdp	1.98 (4.32)*	0.47 g_m (5.25)*	0.47		13.20 (0.000)	0.91 (0.010)	11.54 (0.000)
x	4.60 (3.77)*	0.53 g_m (2.24)*	0.13		11.75 (0.000)	0.88 (0.002)	8.20 (0.000)
gdp (2SLS)	-2.07 (-1.77)	0.88 x (5.25)*	0.47		13.20 (0.000)	0.91 (0.010)	11.54 (0.000)
Upper-middle income							
gdp	2.80 (5.55)*	0.22 g_m (1.85)	0.11		**0.11 (0.745)**	**0.98 (0.881)**	**3.00 (0.051)**
x	4.76 (4.98)*	0.27 g_m (1.20)	0.05		**0.14 (0.709)**	**0.92 (0.055)**	**0.20 (0.897)**
gdp (2SLS)	-1.08 (-0.43)	0.81 x (1.85)	0.11		**0.11 (0.745)**	**0.98 (0.881)**	**3.00 (0.051)**

Notes: Numbers within parentheses are t-value statistics. The asterisk (*) represents that the values are statistically significant at the 95% level. Diagnostic tests in bold represent that the test is accepted: 1. No heteroskedasticity. 2. Residuals normally distributed. 3. No omitted variables. The bracketed terms are the P values.

Table 2. Equations by income level excluding oil producers [a]

Dependent variable	Constant	Independent variable	R^2	Diagnostic tests	Breusch-Pegan/Cook-Weisberg test[1]	Shapiro-Wilk test[2]	Ramsey RESET test[3]
Developing countries							
gdp	1.92 (7.38)*	0.48 g_m (9.88)*	0.57		**0.10 (0.756)**	0.95 (0.012)	**0.77 (0.512)**
x	2.89 (4.90)*	0.91 g_m (8.26)*	0.49		**0.58 (0.447)**	**0.98 (0.828)**	**1.32 (0.275)**
gdp (2SLS)	0.39 (1.01)	0.52 x (9.88)*	0.57		**0.10 (0.756)**	0.95 (0.012)	**0.77 (0.512)**
Low income (excluding oil producers)							
gdp	2.04 (7.00)*	0.48 g_m (10.07)*	0.80		**0.81 (0.367)**	**0.97 (0.712)**	**0.85 (0.481)**
x	2.26 (2.25)*	1.06 g_m (6.49)*	0.62		**0.20 (0.658)**	**0.95 (0.331)**	**0.64 (0.597)**
gdp (2SLS)	1.02 (2.74)*	0.45 x (10.07)*	0.80		**0.81 (0.367)**	**0.97 (0.712)**	**0.85 (0.481)**
Lower-middle income (excluding oil producers)							
gdp	1.10 (2.34)*	0.65 g_m (7.08)*	0.70		**1.38 (0.239)**	**0.92 (0.102)**	**1.34 (0.292)**
x	1.98 (2.03)*	1.07 g_m (5.69)*	0.60		**0.00 (0.996)**	**0.97 (0.817)**	**0.81 (0.506)**
gdp (2SLS)	-0.09 (-0.15)	0.60 x (7.08)*	0.70		**1.38 (0.239)**	**0.92 (0.102)**	**1.34 (0.292)**
Upper-middle income (excluding oil producers)							
gdp	2.85 (4.53)*	0.23 g_m (1.60)	0.10		**0.00 (0.997)**	**0.97 (0.876)**	3.57 (0.034)
x	5.71 (5.66)*	0.18 g_m (0.82)	0.03		**0.27 (0.604)**	**0.93 (0.112)**	**0.40 (0.754)**
gdp (2SLS)	-4.14 (-0.85)	1.22 x (1.60)	0.10		**0.00 (0.997)**	**0.97 (0.876)**	3.57 (0.034)

Notes: [a] Excluding 16 oil producers from the initial sample (89 countries). Note: Numbers within parentheses are t-value statistics. The asterisk (*) represents that the values are statistically significant at the 95% level. Diagnostic tests in bold represent that the test is accepted: 1. No heteroskedasticity. 2. Residuals normally distributed. 3. No omitted variables. The bracketed terms are the P values.

This conclusion for the full sample of countries (excluding oil producers) changes somewhat when the sample is disaggregated into low income, lower-middle income and upper-middle income countries. In the low income and lower-middle income countries, the elasticity of export growth is dominant (see Table 2 where the diagnostic tests are met), but in the upper-middle income countries, the elasticity of export growth to manufacturing output growth loses its significance. In fact, the relationship between GDP growth and manufacturing output growth is only significant at the 90 per cent confidence

level, and there is no significant relation between GDP growth and export growth, which is surprising.

We now turn to the results in Table 3 and 4 which disaggregate the sample of countries by the continents of Africa, Asia and Latin America, including and excluding oil producing countries. For Africa, the Kaldor first law is strongly supported (see also Wells and Thirlwall, 2003). All the diagnostic tests are satisfied. The elasticity of GDP growth to manufacturing output growth is 0.41, and it is the elasticity of export growth to manufacturing output growth which is dominant. In Asia, the Kaldor first law is also supported[3] and again the dominant influence is the elasticity of export growth to manufacturing output growth. In Latin America, however, the situation is different. The Kaldor first law is supported, but the relation between export growth and manufacturing output growth is weak. The dominant factor is the strong relation between GDP growth and export growth.

Table 3. Equations for different continents

Dependent variable	Constant	Independent variable	R^2	Diagnostic tests	Breusch-Pegan/Cook-Weisberg test[1]	Shapiro-Wilk test[2]	Ramsey RESET test[3]
Africa							
gdp	2.08 (7.25)*	0.45 g_m (6.86)*	0.58		**0.01 (0.906)**	**0.97 (0.469)**	**0.34 (0.795)**
x	1.44 (1.61)	1.21 g_m (5.82)*	0.50		**0.06 (0.805)**	**0.96 (0.312)**	**1.12 (0.357)**
gdp (2SLS)	1.53 (4.35)*	0.37 x (6.86)*	0.58		**0.01 (0.906)**	**0.97 (0.469)**	**0.34 (0.795)**
Asia							
gdp	2.34 (4.37)*	0.47 g_m (7.20)*	0.77		8.09 (0.004)	**0.95 (0.555)**	**1.93 (0.177)**
x	1.12 (0.65)	1.19 g_m (5.56)*	0.67		**1.09 (0.296)**	**0.96 (0.657)**	**0.37 (0.772)**
gdp (2SLS)	1.89 (3.18)*	0.40 x (7.20)*	0.77		8.09 (0.004)	**0.95 (0.555)**	**1.93 (0.177)**
Latin America							
gdp	2.67 (5.96)*	0.38 g_m (2.87)*	0.31		**0.00 (0.984)**	**0.93 (0.216)**	**0.07 (0.977)**
x	4.81 (5.08)*	0.40 g_m (1.46)	0.10		**0.01(0.911)**	**0.92 (0.136)**	**0.35 (0.787)**
gdp (2SLS)	-1.82 (-0.92)	0.93 x (2.87)*	0.31		**0.00 (0.984)**	**0.93 (0.216)**	**0.07 (0.977)**

Notes: Numbers within parentheses are t-value statistics. The asterisk (*) represents that the values are statistically significant at the 95% level. Diagnostic tests in bold represent that the test is accepted: 1. No heteroskedasticity. 2. Residuals normally distributed. 3. No omitted variables. The bracketed terms are the P values.

[3] The residuals are heteroskedastic, but this does not bias the regression coefficient.

Table 4. Equations for different continents excluding oil producers [a]

Dependent variable	Constant	Independent variable	R^2	Diagnostic tests	Breusch-Pegan/Cook-Weisberg test[1]	Shapiro-Wilk test[2]	Ramsey RESET test[3]
Africa (excluding oil producers)							
gdp	2.23 (7.39)*	0.43 g_m (6.43)*	0.60		**0.02 (0.892)**	**0.97 (0.779)**	**1.14 (0.351)**
x	1.68 (1.84)	1.14 g_m (5.54)*	0.53		**0.41 (0.520)**	**0.97 (0.684)**	**1.49 (0.241)**
gdp (2SLS)	1.58 (4.12)*	0.38 x (6.43)*	0.60		**0.02 (0.892)**	**0.97 (0.779)**	**1.14 (0.351)**
Asia (excluding oil producers)							
gdp	2.35 (4.17)*	0.47 g_m (6.91)*	0.77		6.86 (0.008)	**0.95 (0.650)**	**1.78 (0.209)**
x	1.23 (0.68)	1.18 g_m (5.33)*	0.67		**0.87 (0.351)**	**0.95 (0.618)**	**0.38 (0.767)**
gdp (2SLS)	1.86 (2.95)*	0.40 x (6.91)*	0.77		6.86 (0.008)	**0.95 (0.650)**	**1.78 (0.209)**
Latin America (excluding oil producers)							
gdp	2.69 (4.53)*	0.37 g_m (2.13)*	0.25		**0.00 (0.967)**	**0.93 (0.308)**	**0.35 (0.793)**
x	5.46 (5.32)*	0.32 g_m (1.06)	0.07		**1.28 (0.258)**	**0.89 (0.079)**	**0.59 (0.635)**
gdp (2SLS)	-3.66 (-1.04)	1.16 x (2.13)*	0.25		**0.00 (0.967)**	**0.93 (0.308)**	**0.35 (0.793)**

Notes: [a] Excluding 16 oil producers from the initial sample (89 countries). Note: Numbers within parentheses are t-value statistics. The asterisk (*) represents that the values are statistically significant at the 95% level. Diagnostic tests in bold represent that the test is accepted: 1. No heteroskedasticity. 2. Residuals normally distributed. 3. No omitted variables. The bracketed terms are the P values.

Conclusions

This is the first attempt, to our knowledge, to establish the link between manufacturing output growth and export growth across a wide sample of developing countries, and to provide an alternative open economy interpretation of the strong link between manufacturing output growth and GDP growth (Kaldor's first law) through the impact that manufacturing output growth has on export growth, and the effect that export growth has on GDP growth by providing foreign exchange for imports and relaxing a balance of payments constraint on demand. The results accord with the recent pioneering work of Hausmann, Hwang and Rodrik (2007) on 'what you export matters'. Countries grow fast if they have an export structure geared to the production and income levels of rich countries where the demand for high value-added goods is strong. Countries producing manufactured goods with a high income elasticity of demand in world markets will have

a higher growth of exports and a higher growth of GDP. Hausmann *et.al*. show a close correlation across countries between what they call PRODY (the income level of the country to which each export is geared to), EXPY (the weighted average of the PRODYs), and GDP growth. As they remark 'types of goods in which a country specializes has important implications for subsequent economic performance' (ibid. p.24), and our results support this conclusion.

In explaining the strong link between manufacturing output growth and GDP growth, there is no doubt a combination of mechanisms operating. Kaldor chose to concentrate on the static and dynamic returns to scale that characterize manufacturing more than agriculture and services, but he was also aware of the role of exports in the growth process, particularly for very open economies such as regions. In fact, his cumulative causation model (Kaldor, 1970) has both export growth and returns to scale in manufacturing as integral elements. In his basic growth laws, however, exports are missing. What we have shown here is that it is possible to estimate a similar elasticity of GDP growth with respect to manufacturing output growth which doesn't rely on returns to scale within industry and induced productivity growth outside industry but instead can be derived from two structural equations linking export growth to manufacturing output growth and GDP growth to export growth.

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Appendix

Table A1. List of countries and variables used in the analysis

	Country	Region	Income Group	Oil producer	x	g_m	g
1	Algeria	Africa	Upper middle income	yes	2.53	0.03	2.64
2	Argentina	Latin America	Upper middle income	no	6.84	3.83	4.50
3	Armenia	Asia	Lower middle income	no	0.18	1.86	3.01
4	Azerbaijan	Europe	Lower middle income	yes	17.45	-3.75	5.32
5	Bangladesh	Asia	Low income	no	12.03	7.33	5.40
6	Belarus	Europe	Upper middle income	yes	2.73	5.15	3.38
7	Belize	Latin America	Lower middle income	yes	5.90	5.28	5.10
8	Benin	Africa	Low income	no	3.33	5.52	4.29
9	Bhutan	Asia	Lower middle income	no	12.34	8.75	7.00
10	Bolivia	Latin America	Lower middle income	yes	6.02	3.97	3.91
11	Botswana	Africa	Upper middle income	no	3.71	4.04	5.07
12	Brazil	Latin America	Upper middle income	no	6.23	1.95	2.75
13	Bulgaria	Europe	Upper middle income	no	1.58	5.05	1.06
14	Burkina Faso	Africa	Low income	no	7.31	6.61	5.32
15	Cambodia	Asia	Low income	no	20.72	14.48	7.77
16	Cameroon	Africa	Lower middle income	yes	1.54	2.88	2.05
17	Central African Republic	Africa	Low income	no	-3.22	0.45	1.10
18	Chile	Latin America	Upper middle income	no	6.90	4.03	5.15
19	China	Asia	Lower middle income	no	16.46	11.39	10.11
20	Colombia	Latin America	Upper middle income	yes	5.62	1.30	3.63
21	Congo, Dem. Rep.	Africa	Low income	no	2.42	-3.40	-0.23
22	Congo, Rep.	Africa	Lower middle income	no	4.28	4.22	3.01
23	Costa Rica	Latin America	Upper middle income	no	7.69	4.82	4.75
24	Cote d'Ivoire	Africa	Lower middle income	yes	3.08	1.85	1.31
25	Cuba	Latin America	Upper middle income	no	5.80	0.46	1.82
26	Djibouti	Africa	Lower middle income	no	-1.48	-1.92	0.95
27	Dominican Republic	Latin America	Upper middle income	no	4.65	4.36	5.16
28	Ecuador	Latin America	Lower middle income	yes	5.68	2.88	3.42
29	Egypt, Arab Rep.	Africa	Lower middle income	yes	7.88	5.32	4.50
30	El Salvador	Latin America	Lower middle income	no	8.69	3.52	3.25
31	Eritrea	Africa	Low income	no	4.35	1.77	3.92
32	Ethiopia	Africa	Low income	no	6.85	4.61	5.68
33	Gabon	Africa	Upper middle income	yes	0.56	3.07	2.30
34	Gambia, The	Africa	Low income	no	1.74	2.12	3.24
35	Guatemala	Latin America	Lower middle income	no	4.00	2.55	3.71
36	Guinea	Africa	Low income	no	1.06	3.34	3.35
37	Honduras	Latin America	Lower middle income	no	2.82	3.77	3.54
38	India	Asia	Lower middle income	no	13.64	6.70	6.49
39	Indonesia	Asia	Lower middle income	yes	7.41	5.98	5.09
40	Iran, Islamic Rep.	Middle-East	Lower middle income	yes	5.12	8.99	4.87
41	Jordan	Middle-East	Lower middle income	no	4.16	7.18	5.41
42	Kazakhstan	Europe	Upper middle income	no	1.98	7.02	2.73
43	Kenya	Africa	Low income	no	5.20	2.65	3.14
44	Kyrgyz Republic	Europe	Low income	no	3.48	-0.60	0.84
45	Lao PDR	Asia	Low income	no	7.66	11.40	6.72
46	Latvia	Europe	Upper middle income	no	5.44	-0.96	0.82
47	Lebanon	Middle-Easte	Upper middle income	no	13.61	1.96	6.96
48	Lesotho	Africa	Lower middle income	no	11.32	8.12	4.08
49	Lithuania	Europe	Upper middle income	no	9.04	6.16	1.19
50	Macedonia, FYR	Europe	Upper middle income	no	3.90	-1.94	0.95
51	Madagascar	Africa	Low income	no	5.40	3.04	2.29
52	Malaysia	Asia	Upper middle income	no	8.54	7.25	6.03

	Country	Region	Income Group	Oil producer	x	g_m	g
53	Mali	Africa	Low income	no	9.48	1.48	4.48
54	Mauritania	Africa	Low income	no	2.42	0.82	3.83
55	Mauritius	Africa	Upper middle income	no	4.48	3.35	4.66
56	Mexico	Latin America	Upper middle income	no	8.73	3.00	2.85
57	Moldova	Europe	Lower middle income	no	7.16	0.89	-1.54
58	Morocco	Africa	Lower middle income	no	6.57	3.17	3.79
59	Mozambique	Africa	Low income	no	14.30	8.79	6.43
60	Myanmar	Asia	Low income	no	12.70	11.07	8.39
61	Nicaragua	Latin America	Lower middle income	no	9.21	5.12	3.13
62	Pakistan	Asia	Lower middle income	no	6.04	5.51	4.21
63	Panama	Latin America	Upper middle income	no	5.58	2.42	6.07
64	Papua New Guinea	Asia	Lower middle income	no	7.00	2.42	3.99
65	Paraguay	Latin America	Lower middle income	no	6.02	0.08	3.03
66	Peru	Latin America	Upper middle income	no	7.18	4.45	4.51
67	Philippines	Asia	Lower middle income	no	5.97	3.26	3.80
68	Poland	Europe	Upper middle income	no	9.38	7.77	3.91
69	Rwanda	Africa	Low income	no	8.61	2.53	5.36
70	Senegal	Africa	Low income	no	3.37	2.96	3.35
71	Seychelles	Africa	Upper middle income	no	8.72	5.92	3.67
72	South Africa	Africa	Upper middle income	no	3.37	1.78	2.57
73	Sri Lanka	Asia	Lower middle income	no	5.71	6.28	5.40
74	Sudan	Africa	Lower middle income	yes	15.55	5.32	5.76
75	Swaziland	Africa	Lower middle income	no	6.30	2.75	3.40
76	Tajikistan	Europe	Low income	no	1.81	0.13	0.51
77	Tanzania	Africa	Low income	no	13.53	5.71	5.17
78	Thailand	Asia	Lower middle income	no	8.36	6.52	4.60
79	Togo	Africa	Low income	no	1.96	4.07	2.37
80	Tunisia	Africa	Lower middle income	no	3.93	3.23	4.45
81	Turkey	Asia	Upper middle income	no	7.49	4.94	4.32
82	Uganda	Africa	Low income	no	15.63	9.53	6.97
83	Ukraine	Europe	Lower middle income	no	-0.68	-0.32	-1.47
84	Uruguay	Latin America	Upper middle income	no	6.28	1.24	3.25
85	Uzbekistan	Europe	Low income	no	3.97	2.21	3.57
86	Venezuela, RB	Latin America	Upper middle income	yes	1.12	1.63	3.05
87	Vietnam	Asia	Low income	no	15.94	9.74	7.25
88	Yemen, Rep.	Middle-East	Low income	yes	12.80	3.61	4.24
89	Zambia	Africa	Low income	no	8.95	3.13	3.18

Source: World Bank, *World Development Indicators 2013*, Washington D.C.