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THE EXPORT-LED GROWTH MODEL OF ECONOMIC DEVELOPMENT

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ABSTRACT

This survey paper reviews the theoretical basis and associated empirical evidence in relation to the export-led growth (ELG) model. Advocates of the ELG model advance the developmentalist proposition that export growth can be utilised by government as a socio-economic steering mechanism, that is, as an engine of production and employment growth in an economy. But whilst in its most recent third incarnation the ELG-model has been promoted as a universal strategy for industrialisation, superior to the competing import-substitution model of growth, the debate as to the relative merits and explanatory powers of the competing models, remains some way from resolution. In particular, the ELG model's formulation of the causal linkage between exports and economic growth has been subject to increased theoretical and empirical scrutiny. Theoretical objections to the ELG model include counterclaims that the process of economic modernisation and growth is simply too complex to be accounted for by a simple model. Further, an increasing volume of ever more sophisticated empirical studies now lend little unambiguous support to the simple export growth-income growth linkage. For whilst a few countries provide evidence of a unidirectional linkage without feedback, this is exceeded by the number of countries in respect of which there is either (i) evidence of a bidirectional causal linkage or (ii) no evidence of a causal linkage at all. The continuing challenge for researchers is therefore to continue the quest for fresh insights into the nature of the variant, typically country-specific, interconnected mechanisms of economic development, growth and trade with a view to articulating policy guidelines for enlightened receptive governments.

Introduction

The issue of how a nation can accelerate the pace of its economic development, 'is one of the most enduring questions in economics' (Riezman *et al.* 1996, p.78). The importance of the issue to poor developing countries in particular can scarcely be over estimated, which Lucas adverted to with the rhetorical question:

> *Is there some action a government of India could take that would lead the Indian economy to grow like Indonesia's or Egypt's?'* (cited in Sarel 1995, p.247, emphasis added).

This paper surveys some aspects of the extensive economics literature concerning the export-led growth (ELG) model. In the first part, the basis of the ELG model as a theory of industrial development is considered. The second part comprises an overview of the extensive empirical literature with respect to the robustness of the ELG model, with a focus on Asian economies in light of the common view that their high investment rates and export orientation have, until recently, been 'engines of growth' (Sarel 1995, p.251)[1].

The Theoretical Basis of the Export-Led Growth Model of Development

There are at least three distinctive interpretations of the concept of export-led growth (Boltho 1996). The first contribution was from 'vent for surplus' models in which the rapid growth of world demand for natural resource commodities from temperate zone lands settled by European migrants boosted domestic growth in those colonial economies, through direct and indirect effects. The second version which was developed in the 1960s, placed stress on the initial competitive advantage which could be obtained from an undervalued exchange rate or low labour costs. Whilst more recently,

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[1] There has been an extensive, albeit occasionally ill-tempered, ongoing inquiry into the causes of the increasing wealth of Asia's newly industrialised countries. It now emerges that very little of the so-called "Asian miracle" remains unexplained beyond a one-shot increase in factor inputs, ie the rapid accumulation of financial, physical and human capital resources (World Bank 1993; Young 1995; Dowrick 1995). For example, Singapore's constant price investment to GDP ratio peaked at 47% in

> ... the focus has shifted to the developing countries and supply aspects have been given much greater importance in the debate of whether economic policies should be outward or inward looking. In this context it is openness to external trade that is considered crucial for growth ... (Boltho 1996, p.417)

The neoclassical theory of ELG has its basis in exogenous growth theory - the Swan-Solow model - with its constant returns to capital, and convergence thesis to the effect that all economies should converge on a unique steady state. Exogenous growth theory has however, been challenged on theoretical and empirical grounds (Yaghmaian 1994). A number of variant endogenous growth models have been developed, premissed on growth being the product of deliberate investment with spillover effects countering otherwise diminishing returns, as well as in some models (eg. Lucas 1988) the role of human capital and/or knowledge stocks as a complimentary input (Dowrick 1995, pp.20-25).

The most recent formulation of the ELG model – its application to developing countries – can be usefully appraised in conjunction with structuralist and neo-structuralist development theory in which industrialisation is viewed as a pre-condition for both aggregate growth and modernisation of "backward" societies. According to development theory, there are - besides agriculture based industrialisation strategies (Kuznets 1966) - two major competing modes or strategies of industrialisation available: (i) industrialisation via import-substitution; and (ii) industrialisation via an export orientation or "export substitution" in which the export of "non-traditional products" replaces primary products (Martinussen 1997, Chapter 6). However it should not be overlooked that the ELG growth theory is as frequently applied to middle income and the leading industrialised countries in an endeavour to ascertain the parameters of the linkages between real GDP growth, income and trade (eg Kugler 1991; Afxentiou and Serletis 1991; Marin 1992; Riezman *et al.* 1996).

The import-substitution model of industrialisation, as outlined by the pioneers of post-World War II development economics including Prebisch (1950), Singer (1950) and

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1984 (Young 1995) though some of this was sourced in foreign direct investment, which continues to be a prime driving force behind Singapore's economy.

Nurske (1953) was founded on export-pessimism (Bhagwati 1990). According to Prebisch the terms of trade for primary products, then the main export of developing countries, were secularly declining exogenously to the policies of their governments. Prebisch believed that such decline could be countered by industrialising, and which would otherwise avoid the inevitable government intervention in the form of tariff protection and domestic subsidies, with the accompanying price distortions. And Nurske advocated the equally pessimistic view that foreign markets had a low capacity to absorb developing countries' imports on a sufficient scale to sustain their development, and so promoted a policy of 'balanced growth' in which government provided incentives (tariffs and subsidies) to stimulate the process of domestic industrialisation.

Import substitution strategies were widely accepted by development economists and implemented during the period from the 1950s to the 1970s, notwithstanding the growing skepticism over that period of an increasing number of analysts whose adherence to free trade theory was buttressed by growing evidence of the superior performance of the more open and outward oriented economies vis-à-vis those countries adopting protectionistic trade regimes (Edwards 1993). And the structuralist view of economic development was associated with a strong commitment to central planning (the USSR's centrally planned large-scale capital intensive industrialisation providing the model) and creation of a domestic heavy capital good sector as a means of achieving economic independence (Bruton 1998, p.907).

India provides a classic illustration of the adoption of a development program premissed on an import substitution strategy, commitment to central planning, and state-led capital intensive industrialisation. Interestingly, the Indian economic strategy of a plan frame, the Mahalanobis model and import substitution as Nayar (1997, p.36) explains did not have their origin in post-World War II economic development theory, but preindependence, 'in Nehru's understanding of the logic of power in the international system and his admiration for the Soviet model'. Following the Government of India's formal adoption in 1954 of the social pattern of society as the goal of economic policy, the 1956 Industrial Policy Resolution and successive Five Year Plans thereafter, chalked out the development strategy of a mixed economy in

which the public sector would take the catalytic role of entrepreneurial substitution in economic transformation (Sarma 1995, p.289).

The implementation and management of import substitution strategies by many governments however, proved to be problematic. Understanding of the various forms of protection was primitive; in developing countries, planning was not able to be completely centralised and plans varied widely in extensiveness and sophistication; and there was only a partial comprehension of the process whereby domestic savings and investment levels might be lifted sharply (Bruton 1998, pp.910-911).

It is important to note at this juncture, that contrary to the export pessimism of Prebisch, Nurske and others – on which import substitution strategies have been premissed – since World War II, world trade has grown faster than world income; in other words, a pessimistic view of trade as between developed and developing countries, has proven to be unjustified (Bhagwati 1990, p.13).

The Export-led Growth Hypothesis

The ELG hypothesis, that export growth is a main determinant of production and employment growth in an economy, can be articulated as four propositions (Kugler 1991, p.73):

- export growth leads through the foreign trade multiplier to an expansion of production and growth;
- the foreign exchange generated by export growth enables capital goods to be imported, thereby increasing the economy's productive capacity;
- economies of scale are obtained by the competition to supply larger export markets which accelerates technical progress in production; and
- that the generally observed correlation of export and production growth can be interpreted as empirical evidence in favour of the export-led growth hypothesis.

The multiplier effect is at the core of the ELG theory. Trade is regarded as a leading key propulsive sector, 'an initial favourable shock in the export sector sets in motion forces

leading to additional economic growth' (Buffie 1992, p.215). To that core proposition Bhagwati (1990, pp.22-4) adds:

- the positive effects of resource allocation efficiency;
- lower levels of directly unproductive profit seeking and rent-seeking; and
- higher inward bound foreign direct investment.

As Bhagwati (1990) explains, developing countries which have adopted the import substitution as opposed to the export led growth mode of modernisation and industrialisation, tend to have a chaotic, nontransparent and uncosted regime of effective exchange rate measures (EERs) in place, which is applicable to a broad range of export and import-competing activities. This gives rise to highly differential social returns for varying activities some of which may occur simply from investment controls, thereby distorting the optimal allocation of typically scarce resources. Meanwhile, directly unproductive activities divert resources from socially valuable to less valuable activities, 'designed to earn profits (or income) by lobbying to change policies or to evade them or to seek the revenue and rents they generate' (Bhagwati 1990, p.23). Furthermore, inward bound tariff-jumping foreign direct investment in a country with import-substitution policies, can be immiserating, generating low social returns (by world or export-promoting country standards) and in any event, 'will be self-limiting in the long-run because they are aimed at the home market and therefore constrained by it' (Bhagwati 1990, p.24).

To sum up, those countries typically developed what is aptly described as "*the import substitution syndrome*", which engendered all kinds of departures from rational economic management in an illusory quest for poverty-reducing growth:

> ... including reliance on a central planning effort of greatly varying efficacy; a set of nominal tariffs and ERPs that generally show little economic rationale; quotas; exchange controls; overvalued exchange rates that contribute to underemployment and underutilization of capital in capital-scarce economies, and penalized exporting; and in many countries, a difficult wage-setting situation. In most countries, agriculture was also penalized in one way or another. The justification for all this

> seemed to be that once the structure of the economy was changed, learning would occur automatically and resolve the difficulties. Learning, however, proved more difficult. (Bruton 1998, p.914).

Balasubramanyam *et al.* (1996) tested Bhagwati's hypothesis in relation to foreign direct investment using cross-country data for 46 developing countries over the 1970-85 period. The empirical evidence (despite shortcomings of the available data) provided a degree of support for Bhagwati's hypothesis that the growth enhancing effects of foreign direct investment were stronger for those countries adopting export-promoting policies.

Undue reliance however, on attracting foreign direct investment to a country, to produce for the export market, in a reversal of previous import-substitution policies, can come at an excessively high price and prolong economic dependence. For example, in the Republic of Ireland, hitherto one of Europe's more somnolent rusticated economies, a strategy of foreign direct investment based ELG was achieved by excessive subsidisation of foreign-owned high-technology capital intensive enterprises. For whilst attracting a sizeable level of foreign direct investment transformed the Irish economy as intended (by 1988 over 50 percent of its GDP was derived from industrial exports) it unintendedly perpetuated a dualistic manufacturing sector, as well as contributing to a burgeoning national debt of over 130 percent of GNP (1986-88) which consumed some 4 percent of GNP and 15 percent of export earnings. Furthermore, about 40 percent of annual export earnings were being repatriated to the home countries of the Republic of Ireland's foreign-owned companies (O'Sullivan 1993).

What was true for the Republic of Ireland as regards the excessive costs which may be sustained in an ELG strategy based on attracting foreign direct investment, is even truer for most developing countries. As Anwar Shah (1995, p.25) observed in the World Bank report *Fiscal Incentives for Investment and Innovation*, developing countries:

> ... would be well advised to limit the use of such tax preferences and instead concentrate on eliminating disincentives to invest that arise from infrastructural

deficiencies, the regulatory regime, and lack of a legal framework, institutions, and enforcement.

Whilst the ELG model has been extensively promoted as a universal strategy for economic modernisation and industrialisation, superior to the alternate import-substitution model, the on-going debate as to their relative merits and explanatory power is not yet resolved. For example, in the more successful developing countries import-substitution based industrialisation has facilitated the establishment of a capitalist home market as a precursor to export promotion, avoiding in the process the hazard of initially protected infant industries failing to mature, becoming "industrial geriatrics" reliant on continuing "soft budget constraints" (Kornai 1995) that is, government support, for their survival.

Secondly, the orientation of a country's policy settings in relation to the range of possible industrial policy measures is seldom polarised, but more typically occupies some moderated position on a continuum ranging from free trade at one end to a closed, protected economy at the other end. This was implicitly recognised by the World Bank (1987) in its *World Development Report* in which amongst other things, it sought to allocate 41 countries to one of four positions on an inward-outward orientation scale. According to that measure, just three of the four so-called Asian tigers were classified as being strongly outward-oriented.

Thirdly, as adverted to above, the process of developing an industrial economy partly in reliance on an export-led growth strategy over the medium term may require the interim adoption of import substitution and protectionistic measures to foster the initial development and maturation of infant industries in the domestic economy. For example, though small developing countries such as Hong Kong and Singapore were forced to adopt an export orientation at an early developmental stage owing to the confines of the home market, others such as South Korea went through an elongated phase of developing a domestic industrial base, capitalist home market and competitive capacity (with high tariff barriers, monopolistic conditions and pervasive levels of government intervention in the

economy) before entering the export expansion phase (Yaghmaian 1994; Sridharan 1996; Bruton 1998)

Fourthly, the formulation which the ELG model posits as to the causal linkage between exports and growth has been subject to extensive theoretical and empirical scrutiny and found often not to be statistically sustainable (this issue is examined further below). Also, the first two arguments as outlined by Kugler (1991) – as detailed above - in support of the ELG model, are based on a Keynesian-type short-run model with a demand orientation which is ill-suited to explaining economic growth (Kugler 1991, p.73).

And fifthly, higher total factor productivity is not necessarily determined by exports. Indeed, economic growth and a good export performance can be the cointegrated outcome of the process of development and structural change (Yaghmaian 1994, pp.1978-9). As Yaghmaian cogently argues (at p.1979):

> Development is a dynamic process of interrelated economic, social, cultural and institutional transformations, leading to changes in the composition of production and sectoral distributions of resources.

Import-Substitution and Export-Promotion Trade Strategies

Governments typically adopt a veritable raft of investment and trade measures and strategies in order to promote economic development, and which typically include import-substitution or export promotion strategies. In order to make cross-country comparisons, it was necessary to develop robust indicators of trade protection and orientation. The most widely accepted indicators of export promotion and import-substitution trade strategies relate to incentives. As Edwards (1993, pp.1361-1366), outlines, the concept of "effective rates of protection" was developed – by Corden, Balassa and Johnson in the mid-1960s – in order, 'to capture in a single indicator the rate of protection granted to *value added* in a given industry'.And subsequent studies by Krueger (1978) and Bhagwati (1981) developed methodologies for formally classifiying the overall degree of bias against exports in trade regimes (cited in Edwards (1993, pp.1364-5)).

These indicators are based on the relative (average) effective exchange rate for exports (EERx) and imports (EERm), so that a bias against exports - an import substitution strategy - occurs when EERx is less than EERm. Conversely, an export promotion strategy is said to occur where EERx equals EERm, and an 'ultra-EP' strategy where EERx is greater than EERm. However, by convention an export promotion strategy is deemed to encompass both the technically neutral EERx equals EERm strategy and the pro-export or 'ultra-EP' strategy (Milner and McKay 1995, pp.61-63).

Furthermore, so-called 'mixed interventions' of export promotion and import substitution are also possible, which for example, may combine for any given firm or industry level, selective interventions to assist export oriented industries by exempting critical imports from duty. This mixed intervention strategy was defined as 'protected export promotion' by Liang (cited in Milner and McKay 1995, at p.62).

The effective rate of protection ('*e*') or subsidisation, comprises the net effect of all taxes and subsidies on inputs and outputs, with the overall trade strategy of a country at a given time being expressed in terms of the trade regime bias indicator:

$$B = 1 + Em/1 + Ex \qquad (1)$$

Trade regime bias indices have been calculated for most countries. Table 1 below (Milner and McKay 1995, p.64) details the trade regime bias or incidence of protection for various countries. An indice of above 1.0 (EERm > EERx) shows an import-substituting bias. Countries also as one might suspect, not infrequently change the overall bias of their trade regimes over time. For example, as Table 1 reveals, South Korea had negative rates of protection for both imports and exports in 1968 for an almost neutral trade regime indice of 0.97. Then over the course of a decade, the variables Em and Ex had both become positive (at 33 and 14), to give an overall bias of 1.17. Accordingly, by 1978 with both Ex > 0 and Em > 0, South Korea's trade regime had markedly altered from one of neutrality to a mixed intervention strategy of 'protected export promotion' as defined by Liang.

However, obtaining the true measure of a country's trade regime bias is problematic. The equilibrium pattern of relative prices depends on the impact of policy measures on changes of both nontradeable goods prices and endogenous characteristics of the economy. In addition, measures of the trade bias need to be adjusted for currency overvaluation by reference to purchasing power parity though the adjusted real exchange rate will typically rise as non-uniform tariff and export subsidies lift the domestic price level relative to external prices (Milner and McKay 1995, p.71)

Table 1: Average Effective Rates of Protection for Importables and Exportables and Trade Regime Bias Indices for a Selection of Countries

	Effective Rates of Protection %		Trade Regime Bias
	Em	*Ex*	(*B*)
Barbados (1988/89)	221	10	2.92
Trinidad (1991)	154	-21	3.22
Mauritus (1990)	79	-3	1.85
Uganda (1992)	62	-15	1.91
South Korea (1968)	-12	-9	0.97
South Korea (1978)	33	14	1.17
Israel (1968)	14	-18	1.39
Argentina (1969)	41	-60	3.53
Singapore (1967)	2	-6	1.09
Taiwan (1969)	18	-13	1.36
Colombia (1969)	5	26	0.83

Source: C. Milner and A. McKay (1995) 'Neutrality and Export Promotion: Issues, Evidence and Trade Implications', in V.N. Balasubramanyam and D. Greenaway (eds) *Trade and Development: Essays in Honour of Jagdish Bhagwati*, Chapter 5, p.64 Table 5.1, simplified.

It is also necessary to distinguish Bhagwati's (1990) 'incentives-defined EP strategy' and the technical measurement of a country's trade bias from the traditional concept of export-led growth, the main subject of this paper, which addresses the broader issue of the income effects directly arising from trade and the alleged superiority of ELG, the

notion of which as Bhagwati (1990, p.20) notes is 'closer in spirit to the notion that underlay Nurske's and Lewis's pessimism'. Furthermore, the outcome of trade policy interventions is largely controlled by characteristics of the domestic economy and external economic forces which are mostly beyond the control of policy-makers (Milner and McKay 1995, p.77). This point is reinforced by Riezman *et al.* (1996 p.96), who in a study of 126 countries, found that the correlation between the openness of an economy and the relative strength of exports was a mere 0.0883 which suggested that, 'the success or failure of trade policies in stimulating growth depends on more than merely increasing the volume of trade'.

The Export-led Growth Model: Empirical Evidence

As already noted, the ELG model has been subjected to numerous increasingly sophisticated empirical investigations. The early unidirectional single variable correlation studies comprised fairly unsophisticated static cross-country comparisons (reverse causality being dismissed or ignored). These studies generally concluded that, where identified, rising exports caused income growth simply because they were highly correlated. Fortunately, such studies failed to achieve much in terms of policy prescription and were subject to criticism on several accounts: the correlation analyses lacked a good conceptual framework; the possible impact of other factors was ignored; and an understanding of the causality structure couldn't be obtained because of the failure to distinguish between endogenous and exogenous variables (Dutt and Ghosh 1996, p.168; Edwards 1993, pp.1379-1388).

In 1970, Kravis had rightly asserted (cited in Riezman *et al.* 1996, p.78) that the question was essentially a dynamic one: were exports the handmaiden or the engine of growth? To address this it was necessary to employ time series analysis to see if exports were really driving income, which a number of studies subsequently did, using Granger-causality tests (Jung and Marshall 1985; Chow, 1987; Afxentiou and Serletis 1991; Marin 1992, Serletis 1992, and Riezman *et al.* 1996.)

Empirical investigations of the ELG theory have been dogged by data difficulties not the least being obtaining reliable data for comparative analysis. This has now been solved in part by availability of the Summers and Heston purchasing power parity adjusted Penn World Table data covering the period 1950-1991. In addition, there have been various methodological shortcomings and other constraints. Fortunately recent advances in econometrics combined with more reliable data, have enabled researchers including Kugler (1991), Yaghmaian (1994), Dutt and Ghosh (1996) and Riezman *et al.* (1996) amongst others to undertake comprehensive, more sophisticated analyses which have generated findings that refine, if not contradict, much earlier work. Owing to its evident pre-eminence, the following discussion will focus somewhat on the Riezman *et al.* (1996) research.

The thrust of the Riezman *et al.* (1996) research was directed at not just detecting evidence of ELG, but to measure its strength, as well as taking into account the effect of other variables (especially imports), the possibility of bidirectional causality and the time horizon – that is, whether ELG is a short-term or long run phenomenon.

First, in a dynamic approach, Riezman *et al.* (1996) used a single data source, the purchasing power parity adjusted data of Summers and Heston, to provide a consistent set of comparable cross-country statistics on output in relation to 126 countries for the 1950-1991 period. The measure of income growth was total real GDP in current international dollars, and exports and imports measured the same way. The study also explicitly took account of imports, because ELG theory suggests that they may play a pivotal role - excluding them may mask or overstate the income-effect of exports. Further, they also addressed the issue of whether other typically excluded variables (human and/or physical capital) influenced the exports-income relationship, as well as the temporal response of income to exports.

Secondly, the definition of export-led growth to be tested was that:

> ... there exists a causal ordering (whether direct or indirect) from export growth to income growth, with no "return loop" to export growth. For example, the bidirectional causality found by Chow [1987] does not meet our

> definition of export-led growth, since output growth Granger-causes export growth. (p.85)

Thirdly, their bivariate Granger causality analysis (that export growth (x) caused income growth (y), meaning that the null hypothesis of no causality from x to y is rejected at the 10 percent level) as undertaken for 126 countries produced results consistent with previous studies in finding little evidence of export-led growth.

In brief:

- only 16 of the 126 countries displayed evidence of unidirectional causality from exports to income growth (at the 10 percent level);
- for 14 countries there was evidence of growth-led exports;
- 3 countries showed evidence of bidirectional causality between exports and income; and
- 93 countries exhibited no causal linkage at all between exports and income.

Riezman *et al.* (1996, p.86) then argued that 'the results of bivariate Granger causality tests do not provide a comprehensive picture of the evidence'. This led them to:

- add imports as a third variable because not accounting for imports could produce misleading results; and

- adopt two new statistical measures of ELG.

First, the statistical measure of forecast error variance decomposition (FEVD) was added to address the issue of how much of the variance in forecast errors in future income growth was attributable to innovations in export growth. For countries in which at least 25 percent of the 5 year ahead income forecast variance was explained by exports, the export growth variable was placed second on the decomposition sequence, thereby allowing imports 'the first shot at explaining the variance of income forecasts'. And secondly, the measure of conditional linear feedback, a statistical method which provided a measure of the causal

ordering between exports and income, and also allowed for a flexible time horizon, thereby identifying how long the causal link endured.

Some of the results of their added variable and statistically augmented analysis are as follows. In brief, for Hong Kong, 19 percent of the FEVD was explained by export growth, (controlling for import growth effects), while 25 percent of the forecast error variance for export growth was explained by income growth. Overall, their criterion for *export-led growth* was met for just 19 of the 126 countries. Conversely, there was evidence for *growth-led exports* in 10 countries including Japan and Korea.
Of nine leading Asian countries (Hong Kong, Indonesia, Japan, South Korea, Malaysia, the Philippines, Singapore, Taiwan and Thailand) a causal ordering was clear in just three, although the predictive power of exports to explain income growth rather than the converse, was also evident for the other six. For this group of nine countries, while the FEVD criterion provided weak support for ELG, as Riezman *et al.* (1996, p.94) observed, 'the strength of the causal relationship differs little on average from the rest of the world'.

Riezman *et al.* (1996) also explored the temporal nature of ELG. In two countries which displayed strong evidence of growth-led exports, Japan and South Korea, the temporal relationship varied markedly. For Japan, the feedback from exports to income was virtually nonexistent, while the income to exports feedback link was strong at all frequencies (from about 60 percent in the short-run to 90 percent in the long run), producing overall, weak growth-led exports for cycles longer than 2.29 years. South Korea displayed similar short-run characteristics, but it weakened over the long term, to produce weak export-led growth for cycles over 10.67 years. And adding human capital growth and investment growth (besides import growth) as additional conditioning variables had the effect of strengthening the conditional feedback in each direction (with the exception of Korea) which indicated that the results could be subject to some degree of omitted variable bias.

Finally, Riezman *et al.* (1996) compared their results with those of Jung and Marshall (1985), Bahmani-Oskooee *et al.* (1991) and Afxentiou and Serletis (1992).

Incidentally, the study by Bahmani-Oskooee *et al.* (1991) has been strongly criticised by Dutt and Ghosh (1996, p.168) for their use of quarterly data on the basis that annual data is the proper time reference because, 'the standard economic fundamentals used by the literature to relate exports with economic growth have long gestation periods'. Much the same criticism would equally apply to Kugler's (1991) study which relied on quarterly data for four European countries, the USA and Japan, as well as Bodman's (1996) study of Canada and Australia using seasonally adjusted quarterly data, both of which are discussed below.

Overall, Riezman *et al* (1996) found evidence of export-led growth more often, in 9 of the 37 countries examined by Jung and Marshall (1985) versus 4; and, in 3 of the 16 countries considered by Afxentiou and Serletis (1991) versus just 1. Furthermore, even when the conclusions of Riezman *et al.* (1996) matched the earlier studies, their results differed in general. For while confirming Jung and Marshall's (1985) findings for their four export promotion countries Indonesia, Egypt, Costa Rica and Equador, of 27 causal inferences made in the other studies, they concurred with just 8. This outcome was probably due in their opinion to, 'the fact that none of these papers includes import growth in their analysis, or to differences in data sets, length of sample period or technique' (pp.95-96).

In another recent sophisticated study which critically appraised the entire theory of export-led growth, Dutt and Ghosh (1996) concluded with the disclaimer that while they had cast some light on the export growth-economic growth relationship, the exact relation between the variables could only ascertained by use of a more complex economic model. Furthermore, because the causality structure of ELG appeared to be economy specific, they concluded that attempts at generalisations were inappropriate.

In a period which seems to have witnessed a renewal of interest in the ELG model, Boltho (1996) undertook a wide-ranging study of Japan that appears to have anticpated the criticism by Dutt and Ghosh (1996) of typical empirical studies of the ELG model. Boltho (1996) found that for three periods selected from the 1885-1990 time span, none of the five

tests proposed (Granger-causality, demand shifts versus supply shifts, market growth, the exchange rate and microeconomic evidence) supported the idea of export-led growth in respect of the Japanese economy. On the contrary, economic growth in Japan was propelled by internal forces. Her findings broadly cohere with those of Riezman *et al.* (1996) for Japan, though she did not control for the role of imports.

Earlier on, Kugler (1991) had tested for the existence of a long run/trend relationship between GDP and exports using recently developed multivariate cointegration techniques, by analysing quarterly data (note the criticism by Dutt and Ghosh (1996) above) for six countries (the USA, Japan, Switzerland, West Germany, France and the UK) over the 1970-87 period. He found only weak empirical evidence to support the view of ELG in just two cases (France and West Germany), and that, there seemed to be a 'strong interrelationship between the trend movement of exports and the three other key macroeconomic variables' (pp.79-80).

Yaghmaian (1994) applied cross-section and time series regression analysis to test the neoclassical ELG hypothesis and an alternate hypothesis, that exports and economic growth are preceded by economic development and structural change, to the data of 66 developing countries for the time periods 1971-80 and 1981-90. The regression analysis supported his alternate hypothesis that 'both exports and economic growth are preceded by economic development and structural change'. And while there was statistical support for a positive exports-economic growth linkage, in most cases, 'the estimated coefficient of the average rate of growth of industrial output weighted by the share of industry in total output was larger than the coefficient of exports growth' (p.1984).

Henriques and Sadorsky (1996) investigated the ELG hypothesis for Canada, using annual data for two periods, 1877-1945 and 1946-1991. Their study differed from the earlier Serletis (1992) study of Canada (which had controlled for imports), by using a terms of trade variable and a multivariate estimation method to deal with possible feedback and simultaneity effects, as well as the data's long-run properties. The evidence indicated that the growth-driven exports hypothesis could not be rejected, but

did not support the ELG hypothesis. According to Henriques and Sadorsky (1996, p.552), their finding that changes in growth preceded changes in exports,

> ... is in accord with the development of a small open economy, since a small economy developing efficiently in line with its comparative advantage will specialise and hence turn to foreign markets for exports of goods that use its most abundant factor of production most intensively.

In a somewhat similar vein, Hodne (1994) argued that the theory of ELG was really one of export specialisation, and that the Nordic countries belonged to a group of small countries which had pursued 'a policy of export-market adaption in both the upswings and downswings' (p.303). Furthermore, a good indicator of export specialisation in their economies was the fact while their trade income ratios fluctuated inter-temporally, there was a discernible tendency over the long run for the trade income ratios to rise.

By way of contrast to the Henriques and Sadorsky (1996) study, Bodman (1996) found that in respect of Canada and Australia (albeit relying on quarterly data for the 1960-1995 period) exports Granger-caused economic growth, though the quantitative effect of the short-term relationship was not large. Bodman (1996, p.25) also rejected (at the 95 percent level) causality from productivity to exports, for both countries, except for the Canadian manufacturing sector for which, 'a significant but quantitatively small positive causal relationship cannot be rejected'.

In a recent study of the cyclical relationship between exports and output in the UK for three periods (1885-1913; 1919-1938; 1946-1993), Moosa (1996) found no evidence for causality from exports to output, except for the post-1945 period. These slightly puzzling results, given the UK's trade oriented economy, were accounted for on two grounds. First, estimation limitations. And secondly, the change in the UK's economic position from dominant producer of capital goods up until 1913, to that of a purchaser of capital goods in the post-1945 period of USA industrial leadership when exports provided foreign exchange to import the capital goods and technology necessary to underpin economic growth.

While the study by Moosa (1996) of the UK may have failed to lend support to the ELG hypothesis, a case study of China in relation to the 1952-1985 period by Kwan and Kwok (1995) found support for the validity of the ELG hypothesis. In addition, they claimed that their test results indicated that the coefficient of export growth was structurally invariant to the so-called "Four Modernizations" of 1978, which were government industrial policy interventions designed to promote an outward looking strategy.

Finally, a time series study by Doraisami (1996) of annual data for Malaysia over the 1963-93 period found, in contrast to previous studies, 'strong empirical support for bi-directional growth between exports and output and a positive long-run relationship between exports and growth' (p.228). These findings were in any event not inconsistent with the commonly held view that exports had been the Malaysian economy's engine of growth. But while Malaysia's export-led industrialisation strategy ostensibly promoted growth with equity, real wage growth proved to be surprisingly modest: at 1990 = 100, wage growth from 97.6 to 112.9 over the 1984-1994 period was at best mediocre (Athhukorala and Menon 1997).

Conclusion

The ELG model has been advanced as a mode of outward oriented industrialisation which generates faster GDP growth than the competing import-substitution model. However, the ELG model has been subjected to increasingly critical theoretical and empirical scrutiny. One of the main arguments is that the transformative process of economic modernisation and growth is much too complicated to be reduced to and accounted for by a simple model in which growth is best achieved with an economy oriented to exports.

Although the ELG model has the virtues of parsimony and elegant simplicity, Yaghmaian (1994, p.1979) is undoubtedly correct in asserting that, 'development is a dynamic process of interrelated economic, social, cultural and institutional transformations, leading to changes in the composition of production and sectoral

distribution of resources'. Along similar lines, Harberger (1998) suggests that it is somewhat naïve to try to express the relation between policies and economic growth by resorting to the straightjacket of cross-country growth regressions, but nonetheless offers a vision of the growth process which can be reduced to, 'macroeconomic prudence, outward orientation and domestic liberalization' (p.28).

It is evident nonetheless, that over the long-run, countries which have adopted sustained inward-looking, import-substitution strategies as a key component of a program of modernisation, economic development and growth, have achieved lower levels of GDP growth in respect of which the divergent development trajectories of South Korea and India are highly illustrative.

The empirical evidence, however, lends little unambiguous support for the simple export-led growth-income growth linkage. A few countries provide evidence of a unidirectional linkage without feedback, however this is well exceeded by the numbers of countries in which (i) there is evidence of a bidirectional causal linkage particularly when the imports variable is added, and (ii) there is no evidence of a causal linkage at all.

The continuing challenge for researchers is therefore to gain new insights into the precise nature of the multifaceted mechanisms connecting modernisation, economic development, growth and trade with a view to developing policy guidelines for enlightened, receptive governments.

REFERENCES

Afxentiou, P. and Serletis, A. (1991) "Exports and GNP Causality in the Industrialised Countries", *Kyklos*, Vol.44 No. 2, pp.167-179.

Athukorala, P-C. and Menon, J. (1997) "Export-Led Industrialisation, Employment and Equity: The Malaysian Case", *Agenda* Vol.4 No. 1, pp.63-76.

Bahmani-Oskooee, M., Mohtadi, H. and Shabsigh, G. (1991) "Export Growth and Causality in LDCs: A Re-examination", *Journal of Development Economics,* Vol.36 No.2, pp.405-415.

Balasubramanyam, V.M., Salisu, M. and Sapsford, D. (1996) "Foreign Direct Investment And Growth In EP and IS Countries", *The Economic Journal,* Vol 106 No.434, pp.92-105.

Bhagwati, J. (1990) "Export-promoting trade strategy: Issues and evidence", in Chris Milner (ed) *Export Promotion Strategies: Theory and Evidence from Developing Countries*, New York University Press: New York, Chapter 2.

Bodman, P.M. (1996) "On Export-Led Growth in Australia and Canada: Cointegration, Causality and Structural Stability", *Australian Economic Papers* Vol.35 No.67, pp.282-299.

Boltho, A. (1996) "Was Japanese Growth Export-Led?" *Oxford Economic Papers,* Vol. 48, pp.415-432.

Bruton, H.J. (1998) "A Reconsideration of Import Substitution", *Journal of Economic Literature*, Vol.36 No.2, pp.903-936.

Buffie, E.F. (1992) "On the condition for export-led growth", *Canadian Journal of Economics,* Vol. 25 No. 1, pp.211-225.

Chow, P. (1987) "Causality Between Export Growth and Industrial Development: Empirical Evidence from the NICs", *Journal of Development Economics,* Vol.26 No.1, pp.55-63.

Dodaro, S. (1991) "Comparative Advantage, Trade and Growth: Export-Led Growth Revisited", *World Development* Vol.19 No.9, pp.1153-1165.

Doraisami, A. (1996) "Export Growth and Economic Growth: A Re-examination of some Time-Series Evidence of the Malaysian Experience", *The Journal of Developing Areas,* Vol.30 No.2, pp.223-230.

Dowrick, S. (1995) "The Determinants of Long-Run Growth", in Palle Andersen, Jacqueline Dwyer and David Gruen (eds) *Productivity and Growth*, Reserve Bank of Australia, Sydney, pp.237-259.

Dutt, S.D. and Ghosh, D. (1996) "The Export Growth-Economic Growth Nexus:A Causality Analysis", *The Journal of Developing Areas*, Vol.30 No.2, pp.167-182.

Edwards, S. (1993) "Openness, Trade Libealization and Growth in Developing Countries", *Journal of Economic Literature*, Vol.31 No.3, pp.1358-1393.

Harberger, A.C. (1998) "A Vision of the Growth Process", *The American Economic Review*, Vol.88 No.1, pp.1-32

Henriques, I. and Sadorsky, P. (1996) "Export-led growth or growth-driven exports? The Canadian case", *Canadian Journal of Economics*, Vol. 29 No. 3, pp.540-555.

Hodne, F. (1994) "Export-led Growth or Export Specialization", *Scandinavian Economic History Review & Economy and History*, Vol. 42 No. 3, pp.296-310.

Jung, W.S.and Marshall, P. (1985) "Exports, growth and causality in developing countries, *Journal of Development Economics*, Vol. 8 Nos.1-2, pp.1-12.

Kornai, J. (1995) *Highways and Byways: Studies on Reform And Post-Communist Transition*, The MIT Press, Cambridge Massachusetts.

Kugler, P. (1991) "Growth, Exports and Cointegration: An Empirical Investigation", *Review of World Economics*, Vol. 127 No. 1, pp.73-82.

Kwan, A.C.C.and Kwok, B. (1995) "Exogeneity and the Export-Led Growth Hypothesis: The case of China", *Southern Economic Journal* Vol. 61 No.4, pp.1158-1166.

Kuznets, S. (1966) *Modern Economic Growth*, New Haven, Yale University Press.

Lucas, Robert E. (1988) "On the Mechanisms of Economic Development", *Journal of Monetary Economics, Vol. 22*, pp.3-42.

Marin, D. (1992) "Is the export growth hypothesis valid for industrialized countries?", *Review of Economics and Statistics*, Vol.74 No.4, pp.678-688.

Martinussen, J. (1997) *Society, State & Market: A Guide to Competing Theories of Development*, Zed Books Ltd: London.

Milner, C. and McKay, A. (1995) "Neutrality and Export Promotion: Issues, Evidence and Policy Implications" in V. N. Balasubramanyam and D.

Greenaway (eds) *Trade and Development: Essays in Honour of Jagdish Bhagwati*, Macmillan: London, Chapter 5.

Moosa, I. A. (1996) "The Cyclical Relationship Between Exports and Output In The UK: 1885-1993", *De Economist*, Vol. 144 No. 4, pp.653-647.

Nayar, B.R. (1997) "Nationalist Planning for Autarky and State Hegemony: Development Strategy Under Nehru", *Indian Economic Review*, Vol.32 No.1, pp.19-38.

Nurske, R. (1953) *Problems of Capital Formation in Underdeveloped Countries*, Blackwell, Oxford.

O'Sullivan, P. J. (1993) "An Assessment of Ireland's Export-Led Growth Strategy via Foreign Direct Investment", *Review of World Economics* Vol. 129 No. 1, pp.139-157.

Prebisch, R. (1950) *Economic Survey of Latin America, 1949*, United Nations, New York.

Riezman, R.G., Whiteman, C.H. and Summers, P.M. (1996) "The Engine of Growth or its Handmaiden?: A Time-Series Assessment of Export-Led Growth", *Empirical Economics* Vol. 21, pp.77-110.

Sarel, M. (1995) "Growth in East Asia: What We Can and What We Cannot Infer From It", in Palle Andersen, Jacqueline Dwyer and David Gruen (eds) *Productivity and Growth*, Reserve Bank of Australia, Sydney, pp.237-259.

Sarma, A. (1995) "Performance of Public Enterprises in India" in Dilip Mookherjee (ed) *Indian Industry: Policies and Performance*, Oxford University Press, Delhi, pp.289-321.

Serletis, A. (1992) "Export Growth and Canadian Economic Development", *Journal of Development Economics*, Vol.38 No.1, p.133-145.

Shah, Anwar (ed)(1995) *Fiscal Incentives for Investment and Innovation*, Oxford University Press, New York.

Singer, H.W. (1950) "TheDistribution of Gains between Investing and Borrowing Countries", *American Economic Review* Vol.40 No.2, pp.473-485.

Sridharan, E. (1996) *The Political Economy of Industrial Promotion: Indian, Brazilian and Korean Electronics in Comparative Perspective, 1969-1994*, Praeger, Westport Connecticut.

World Bank (1987) *World Development Report,* Oxford University Press, New York.

World Bank (1993) *The East Asian Miracle*, Oxford University Press, New York.

Yaghmaian, B. (1994) 'Am Empirical Investigation of Exports, Development, and Growth in Developing Countries: Challenging the Neoclassical Theory of Export-Led Growth', *World Development,* Vol. 22 No. 12, pp.1977-1995.

Young, A. (1995) "The Tyranny Of Numbers: Confronting The Statistical Realities Of The East Asian Growth Experience", *The Quarterly Journal of Economics*, Vol.110, No3, pp.641-680.