

THE FEASIBILITY OF LATE INDUSTRIALIZATION IN LEAST-DEVELOPED COUNTRIES

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1. EARLY AND LATE INDUSTRIALIZATION

Late industrialization denotes a 20th century phenomenon, perhaps more pointedly referring to the North East Asian experience including Japan. It is heavily dependent on imports of machineries and equipment and exports of cheap manufactured goods, achieving the transition to industrialization within a remarkably short period of a few decades. Early industrialization, on the other hand is taken to refer to the development of today's advanced western countries during the 19th century. Countries of broadly comparable stage of development became industrialized producing their own capital goods. Imports of technology took place as disembodied entity. Similar technologies were applied in different countries during the transformation from agricultural to industrial economies, even if the transition did not occur at the same period.

2. ISSUE

Late industrialization is, at least on the face of it, often viewed as being imbued with a promise of a fast track for industrial growth compared to that traveled by the present day advanced countries of the West, if only the developing countries would seize the opportunity. How is it then that I propose to talk about the feasibility of this route?

There are, of course, several issues that arise along with late industrialization such as resource availability to import technology, transfer and absorption of technology, international competitiveness, foreign investment and openness of the economy. Some of these issues are difficult to resolve, others less so; to some developing countries resolution is difficult and to some others less so; and stringency of issues changes with passage of time, some being rendered more and others less tractable. These are matters will not deal with.

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Instead, the issue of feasibility of late industrialization in today's least-developed countries is raised in the context of a simple Harrod - Domar (H-D) type growth model incorporating the multiplier investment function and output share of capital and labour. There are three areas of concern. First, the multiplier effect of investment expenditure is small due to leakage of imports. Second, in developing countries, the industrial sector does not expand the domestic market base satisfactorily, since, given that the technology that gets imported is exogenously determined, labour's share in the sector income is relatively low. Third, the prospects of least-developed countries becoming successful in exports of manufactured goods do not appear good.

3. ANALYSES

To start with the H-D growth model may be recalled. It relates the growth rate of an economy to the savings ratio and capital-output ratio.

$$g = s/v$$

where: g = GDP growth rate
 s = savings ratio of GDP
 v = capital-output ratio.

The model was initially developed to define the "knife edge" conditions for steady state growth, at a constant rate of unemployment, wherein the increase in real income would have to be met by equilibrium between investment that is driven by the accelerator mechanism and savings. But it also acquired another importance in the hands of development economists as a tool for growth rate projection in developing countries. Indeed, many five-year development plans used this model to project their medium-term growth rates. In its transformed usage, the H-D variant growth model continued to be cast in terms of the accelerator mechanism. This has led to a missed opportunity (so far as I know) of incorporating the multiplier effect of investment into the H-D growth model, which brings out the peculiarity of the case of the developing countries.

The Multiplier Effect

Although the H-D model was initially constructed in a single-sector economy, it would just as well fit a two-sector economy of investment goods and consumption goods. Given that capital goods are produced domestically, one may conveniently assume that investment expenditures would ultimately be spent domestically, assuming that any imports of capital goods would be counter-balanced by exports. In this instance, there would be no leakage that would reduce the multiplier effect of the investment expenditure. If, in addition, full capacity utilization obtains in consumption goods

sector, then an increase in real income would come about entirely from an increment in capacity. The cycle would subsequently repeat itself on account of induced investment related to the accelerator mechanism.

As regards developing countries, the H-D growth model entails a three-sector economy comprising consumption goods, exports and imports. Investment expenditure would leak out of the economy into imports of capital goods, of machineries and equipment, as well as inputs for construction purposes. Here again, there would be an increase in real income in the same fashion as in the above, but the magnitude of the increase would be significantly less depending on the expansion of aggregate demand that results from the multiplier effect.

The multiplier effect can vary considerably between an advanced country and a developing country, or, alternately, between a two-sector and a three-sector economy. To analyse this, convert the H-D growth model thus:

$$g = i/v$$

where: i = investment ratio of GDP

Under conditions of equilibrium, and abstracting from foreign savings and investment, the converted equation yields the same result of growth rate as in the original model. It is then possible to incorporate the multiplier effect into the H-D growth model. First, the expansion of real income due to the multiplier effect is considered.

$$y' = e/i \quad (\text{advanced country})$$

where: y' and y'' = multiplied income;

$$y'' = \alpha e/i \quad (\text{developing country})$$

e = investment amount

α = ratio of investment spent domestically

The multiplied income in developing countries is less than in advanced countries by the proportion of $(1-\alpha e/e)$. If, for instance $(\alpha) = 0.5$, the multiplied income in developing countries is 50 per cent less than in advanced countries. In terms of growth rate, the comparison would be as follows.

$$\begin{aligned} g' &= i/v & (\text{advanced country}) \\ g'' &= (\alpha) \times (i/v) & (\text{developing country}) \end{aligned}$$

Terms of Trade Effect

In a three-sector economy corresponding to that of developing countries, particularly LDCs, exports of primary products are exchanged for imports of capital goods. Excluding some minerals, this exchange is typically marked by adverse terms of trade.

To import same or comparable capital goods more savings become increasingly required.

Again this makes the H-D growth model lead to different results between advanced and developing countries.

$$g' = s/v \quad \text{(advanced country)}$$

$$g'' = (1-\beta) \times (s/v) \quad \text{(developing country)}$$

where: β = Long-term percentage decline in terms of trade

Domestic Market Base

Aggregate demand increases on two counts within two subsequent stages. First, the multiplier effect at the investment stage, and second the gross domestic value added at the stage of production of consumer goods. Given that a large part of investment expenditure is used for imports, a substantial portion of depreciation will have to be excluded from domestic value addition. Furthermore, inputs of a significant amount that enter into the production process are also imported. Thus, domestic value added of the manufacturing sector is substantially less than the value of its gross output. This tends to lower the domestic market base of the manufacturing sector. For some industries, the size of gross domestic value added may not be that far off the net value added.

Factor shares of capital and labour is another source of difference between early and late industrialization which affects the domestic market size. The value added of the manufacturing sector in Europe and USA during the first half of the twentieth century was divided between capital and labour roughly in the ratio of one-fourth and three-fourth respectively. At the end of the century the share of labour had declined to about two-third. By contrast, capital has a predominant share of value added of the manufacturing sector under late industrialization. Table 1 shows the respective shares of labour and capital in the value added of manufacturing during 1994 – 97, based on a reconstruction of data of value added gross of depreciation. It reveals that in three European countries wages account for about 65 per cent of the value added, while in three newly industrialized countries of Asia wages represent only 33

per cent. Indeed, the respective shares of labour and capital in early and late industrialization appear to stand at somewhat inverse order.

Table 1: Factor Shares in Value Added of Manufacturing

	<u>Share of labour</u>	<u>Share of capital</u>
<i>Advanced countries</i>		
France	64.6	35.4
UK	65.9	34.1
Netherlands	62.2	37.8
Japan ^a	29.7	70.3
<i>NICS</i>		
Korea	34.4	65.6
Malaysia	39.2	60.8
Indonesia ^b	24.2	75.8
<i>Other countries</i>		
Brazil	27.9	72.1
India	34.0	66.0
Egypt ^a	37.9	62.1
Tunisia ^a	43.6	56.4

a - value added net of depreciation

b - average for 1994 - 96

Note: Original date of value added which were gross of depreciation were converted into value added net of depreciation based on assumption of (1) capital - output ratio of 3:1 and (2) annual depreciation rate of 7.5 percent of capital stock.

Source: International yearbook of Industrial Statistics, 2000

Both because gross domestic value added is relatively small and the factor share of labour in the net value added is low, the domestic market base of the manufacturing sector in developing countries becomes somewhat limited. In turn this affects the H-D growth model in the following manner.

$$g' = s/v \quad (\text{advanced country})$$

$$g'' = (\lambda xy) \times (s/v) \quad (\text{developing country})$$

where: λ = ratio of domestic to gross value added

y = share of labour in LDCs as a ratio of advanced countries

Note: It is assumed that wage income is all spent on consumption and that there is no savings from it.

Revised H-D Growth Model

The above arguments reveal that the H-D growth model, in fact, yields different growth rates for developing and advanced countries with the same s/v ratios, due to parametric changes. Bringing together these changes we have:

$$g' = w^{\wedge}[s/v] + w^*[s/v] \quad (\text{advanced country})$$

$$g'' = w^{\wedge}[(\alpha) \times (s/v)] + w^*[(1-\beta) \times (s/v) \times (\lambda \times \gamma)] \quad (\text{developing country})$$

where: (α) , (β) , (λ) , and (γ) are all less than 1, and $w^{\wedge}$ and w^* denote weights and add up to 1.

In an advanced country the leakage on investment multiplier due to imports is likely to be negligible in aggregate terms, as capital goods are traded on both fronts as imports and exports, and, likewise, the disparity between gross output and gross domestic value is likely to be negligible as inputs are internationally traded both ways.

Thus the model,

$g = s/v$, is applicable in its simple form. By contrast, in a developing country the investment multiplier is considerably constrained by leakages of imports of capital goods. Moreover, there is substantial disparity between gross output and gross domestic value in the manufacturing sector, and the labour share in net value added is much lower than in an advanced country. As a result the H-D model as it stands does not capture adequately the condition of developing countries, and requires adjustments of the parameters implicit in the model.

The import of the adjustments is big in two senses. First, for the same savings ratio in an advanced country, the growth rate that obtains in a developing country is much lower.

To illustrate:

Item	Advanced country	Developing country
s	10	10
v	3	3
α	1	0.5
β	n.a.	-0.5
λ	1	0.6
γ	1	0.6
$w^{\wedge}$	0.8	0.8
w^*	0.2	0.2
g'	3.33	
g''		1.45

$$g' = 0.8[0.1/3] + 0.2[0.1/3] = 3.33\%$$

$$g'' = 0.8[0.5 \times 0.1/3] + 0.2[(0.5 \times 0.1/3) \times (0.6 \times 0.6)] = 1.45\%$$

Thus, the differences in growth rate are huge, with a real possibility of developing countries growing at half the rate of the advanced countries!

Second, the focus of concern shifts drastically from the "knife edge" conditions for a steady state growth to an underdevelopment trap, reflecting a fundamental change in the problematic of the H-D model. In a two-sector economy, the H-D model could throw up an issue of imbalance marked by excess demand over supply, whereas in a three-sector economy the issue gets reversed into that of excess supply over demand, with unused capacities and lack of demand inter-twined. Underdeveloped countries fail to realize their full potential of economic growth due to import leakages that weaken the effect of the multiplier mechanism in domestic market creation, further reinforced by the erosion of the capacity to import capital goods due to adverse terms of trade. They get mired in a cumulative process wherein less demand creation leads to less growth, which in turn leads to less savings and investment. Export-led growth appears to provide a way out from this trap.

4. NEWLY INDUSTRIALIZED COUNTRIES

Despite its weaknesses in domestic market creation, late industrialization has shown a remarkable success in North and South East Asia. There are two factors which enabled these countries to surmount this problem and realize fast growth. First, competitiveness in exports of manufactured goods and, second, high ratio of investment. Given the differences in the multiplier effect, domestic value added of manufacturing of consumption goods, and the share of wages in the value added of manufacturing, the gap between the growth paths of two-sector and three-sector economies could be substantial. Growth in the latter group of economies would seriously lag behind the former group. To equalize growth, the gap in the domestic market creation has to be bridged through external market outlets. Hence the importance of exports under late industrialization. The newly industrialized countries (NICs) registered fast growth rate of exports, shifting from exports of primary commodities to exports of manufactured goods at a fairly early stage of their movement towards industrialization. At the same time, NICs had a much higher ratio of savings and investment compared to those of early industrialization. This coupled with external market outlets, made it possible to shorten the period required for industrialization dramatically as they did. Invariably they had export-led growth, which, in hind sight, at least, could be viewed as the optimal route which avoids falling into a trap of unused capacities and lack of effective demand, and permits attainment of a very high level of investment.

Table 2 shows the ratio of exports to GDP, and the share of domestic and foreign market outlets of manufactured products in 1996 for the same group of advanced countries, NICs, and "other countries" as in Table 1. Generally, the ratio of exports was higher in NICs than in European countries (excepting Netherlands where re-

exports is quite high), and also higher than the group of "other countries" which includes Brazil and three developing countries. A more appropriate comparison which uses different dates to situate countries appropriately in terms of their attainment of industrialization, would have brought out even more clearly the extent to which NICs were much more export oriented than the European countries prior to the attainment of a mature industrial economy. For instance, the ratio of exports to GDP in France and UK would have been much less, and that of Korea much higher than for 1996.

Table 2: Manufactures Output and Market Outlet, 1996

	Mfg.% of merchandise exports	Merchandise exports % of GDP	Mfg. Gross output % of GDP	Mfg. market	
				External	Internal
A. Advanced countries					
France	79	22.9	63.7	28.4	71.6
Uk	82	23.7	NEW		
Netherlands	63	52.4	60.2	54.8	45.2
Japan	95	9.2	65.7 ^e	13.3 ^e	86.7 ^e
B. NICS					
Korea	92	31.9	60.0	48.9	51.1
Malaysia	76	92.7	119.0 ^e	59.2 ^e	40.8 ^e
Indonesia	51	27.4	65.3 ^e	21.4 ^e	78.6 ^e
C. Other countries					
Brazil	54	7.0	40.4	9.4	90.6
India	74	12.8	66.5 ^e	14.2 ^e	85.8 ^e
Egypt	32	9.8	76.8	4.1 ^e	95.9
Tunisia	80	35.9	55.1	52.1	47.9

e - estimate.

Note: Original data of manufactures value added as a percentage of GDP was used to derive the ratio of gross output of manufactures to GDP, so as to get compatibility with figures on manufactured goods (mfg) as per cent of GDP.

Source: World Bank, World Development Report, 1998/99, and UNIDO, International Yearbook of Industrial Statistics, 2000.

The market shares of internal and external sales shown in Table 2 have to be treated with caution as they are derived from rough estimates of the ratio of manufacturing output to GDP. Still they give a strong indication that reliance on external market was much higher in NICs than in European countries. While the domestic market

accounted for 72 per cent in France, it covered only 51 per cent in Korea. The figure for Malaysia shows 41 per cent while that for Indonesia shows 79 per cent.

Japan offers an instructive case. It has an economic structure of an advanced country, with GDP contribution of 2 per cent for agriculture, 38 per cent for industry, 25 per cent for manufacturing, and 60 per cent for services in 1997. Furthermore, exports, in 1996, amounted to only 9.2 per cent of GDP and accounted for as little as 13 per cent of the total market of manufactures, 87 per cent being accounted for by the domestic market. Yet, the share of labour in the value added of manufacturing during 1994 – 97 stood at 30 per cent, less than half of European countries. Indeed, in this respect, the position of Japan was broadly similar with NICs and "other countries". Table 1 may be read as a cross section data of share of wages in late industrializing countries at different levels of income per capita or development. It is observed that the wage share does not increase when income per capita increases, and that, in fact, it remains more or less stable. This is an intriguing observation as disparities in the wage share are meant to persist even if productivity of labour becomes comparable between late and early industrializing countries. If so, the explanation for the difference in the share of wages seems to reside in history. Differences in wage level and the process of technological progress during the early stages of industrialization could be important explanatory factors.

5. LATE INDUSTRIALIZATION AT PRESENT

The macro-economic challenge of late industrialization, as distinct from early industrialization, arises from the possible co-existence of unused capacities and lack of effective demand. On one hand, the manufacturing sector is unable to use its capacities fully, and, on the other hand, effective demand cannot be increased to bridge the gap. NICs met this challenge through exports of manufactured goods. By contrast, today's developing countries seem unable to compete effectively in the world trade of manufactured goods.

Table 3 shows the economic structure of NICs and selected "other countries". The contribution of manufacturing to GDP was, in some instances, comparable between the two groups. In 1997, manufacturing accounted for 26 per cent in Korea, 25 per cent in Indonesia and 34 per cent in Malaysia (three NICs), and for 25 per cent in Egypt, 19 per cent in India, 18 per cent in Tunisia and 23 per cent in Brazil having declined from 33 per cent in 1980. But there were major differences in the performance of exports of manufactures, and the extent to which the internal and external markets serve as bases of manufacturing as can be seen in Table 2.

Table 3: Structure of Output, in percent

	Agriculture		Industry		Manufacturing		Service	
	1980	1997	1980	1997	1980	1997	1980	1997
NICs								
Korea	15	6	40	43	28	26	45	51
Malaysia	22	13	38	46	21	34	40	41
Indonesia	24	16	42	42	13	25	34	41
Other Countries								
Brazil	11	14	40	43	28	26	45	51
India	38	27	26	30	18	19	36	43
Egypt	18	16	37	32	12	25	45	53
Tunisia	14	14	31	28	12	18	55	58

Source: World Bank: World Development Report, 1998/99

As in NICs (excepting Indonesia), the merchandise exports of India and Tunisia among the group of "other countries" were predominantly manufactures. These were not exports with only a little or nominal domestic value addition to infer from a comparison of the ratio of gross manufacturing output to GDP shown in Table 2 and manufacturing output to GDP in Table 3. Malaysia's exports appear to depend heavily on such type of exports, but it also has the highest ratio of manufactured output to GDP all of which suggest that lack of depth is compensated by breadth of activity. Where India and Tunisia differ from the NICs, is, however, in the extent to which their economies are export-oriented. In 1996, merchandise exports amounted to 12.8 per cent of GDP in India compared to 31.9 per cent in Korea. Correspondingly, the market for manufactures was about 86 per cent domestic in India, compared to 51 per cent in Korea (and 41 per cent in Malaysia). Thus, although India's exports were mostly manufactured goods, these accounted for a minor share of the output of the sector, which, in fact, was predominantly sold in the domestic market. Tunisia's case, on the other hand, is similar to NICs. Merchandise exports amounted to 35.9 per cent of GDP and the market for manufactures was 52 per cent external.

The other two countries, Egypt and Brazil, have a different picture. Manufactures accounted for a relatively small proportion of 32 per cent of merchandise exports in the case of Egypt, and 54 per cent in Brazil, perhaps not too far off the mark for an NIC. But neither were export-oriented. Merchandise exports amounted to 7 per cent of GDP in Brazil and 9.8 per cent in Egypt, and the external market was for both countries just a small outlet, accounting for only 9 per cent and 4 per cent respectively of their output of manufacturing.

Unlike NICs, foreign trade is not an important market outlet for the manufacturing sector of the group of "other countries", and, possibly, most developing countries excepting countries on a similar track as Tunisia. But this does not foreclose the possibility of industrialization, as evidenced by the case of Egypt and Brazil, whose manufacturing sector stand at a high ratio of GDP. How would the possible constraint of lack of effective demand for manufactured goods be resolved in such instances?

One way would be expansion of domestic market through agricultural development. A well developed agricultural sector, particularly if based on smallholder production, can constitute a significantly large domestic market for manufactures. External market outlet for agricultural products would, however, be necessary in this case. Another way, is development of tourism and other services, which again can contribute to the widening of the domestic market base to support growth of manufacturing. It is worth underlining that in both these instances the problem of effective demand becomes resolved through intermediation of exports. On the face of it, Egypt's success in having a relatively large manufacturing sector which accounts for about one-fourth of its GDP, appears to be the result of a growth process that evolved along both routes of agriculture, tourism and other services (notably transport visa Suez canal). The emergence of a relatively developed manufacturing sector in Brazil is a more complex phenomenon, partly to be explained by starting position of the country related to the Portuguese presence and the industrial substitution policy as far back as the 1930s.

Although success in late industrialization may be feasible through other routes than that taken by the NICs, there is no evidence for this yet. As to the replication of the achievements of NICs in other developing countries or the relatively developed economies of Latin American, there is not enough indication of credible successor examples so far.

