

## **HOW THE WEST GREW RICH**

**NATHAN ROSENBERG & L.E. BIEDZELL, BASIC BOOKS, 1986.**

### Part played by political institutions of Western Europe in its rise to wealth

In the 19<sup>th</sup> and 20<sup>th</sup> centuries, the manufacturing and trading sphere were largely autonomous from political or religious action or restriction compared to the all-inclusive politico-religious society of the Middle Ages. Rather, in the 19<sup>th</sup> century and earlier, Western governments were very active in facilitating manufacturing and trade. How? Governments supplied courts of law to enforce trading agreements and to protect credit by making loans collectible; they vigorously defined and protected property rights, which are essential to investment and trade; they supplied legal modes of organisation responsive to the needs of enterprises; they subsidised railways, canals, turnpikes; they protected domestic enterprise with tariffs and quotas against competition from foreign imports; they supplied a currency that provided a stable measure or value. Some governments provided free compulsory education, transport systems; granted monopolies to encourage the formation of new industries, and patents for new inventions.

From the 19<sup>th</sup> century on, it was out of fashion for governments to regulate trade, tax it appreciably, control prices or wages, or seek to iron out huge differences in individual incomes. The working assumption was that industry and commerce served the general purpose, so that it was the business of government to support and encourage them.

The relative freedom of the political sphere from the responsibility for the economic sphere enabled political leaders to concentrate on and develop other aspects of government – the consolidation of the nation state, the extension of the electoral franchise, the superseding of democratic governments over monarchies; the reform of the judicial system, the overhauling of the penal system; improvement of international relations to avoid wars. Similarly, the diffusion of authority was interwoven with the development of an essentially autonomous economic sector; with the widespread use of experiment to answer questions of technology, marketing, and organisation for which answers could be found in no other way.

The coming into being of the market as a powerful organising force, capable of inducing large numbers of people to form shared goals, dividing the work of achieving the goals among many specialists, and supplying the rewards and incentives needed to get the work done, further restricted interference from the state.

2. Incentives are necessary for the actors in the marketplace to bring about growth. However, when we consider the difficulties in the Third World attempts to achieve growth, it becomes evident that more than incentives are needed. Incentives cannot enable a community to do what it does not know how to do.

3. The immediate sources of western growth were innovations in trade, technology, and organisation, in combination with accumulation of more and more capital, labour, land applied natural resources. Innovation emerged as a significant factor in Western growth as early as the mid – fifteenth century, and from the mid-eighteenth century on it has been pervasive and dominant. Innovation occurred in trading, production, products, services, institutions, and organisation. The main characteristics of innovation – uncertainty, search, exploration, financial risk, experiment, and discovery – have so permeated the WEST'S EXPANSION OF TRADE AND THE West's development of natural resources as to make it virtually an additional factor of production.

Firms, markets, and competition have been important driving forces in the process of innovation.

The state delegated to enterprises the making of decisions basic in the innovation process: which ideas should be tested and which allowed to die. Such tests were costly; they required

resources and competence in engineering, manufacturing and marketing, especially if the innovator was to capture the financial rewards of the innovation.

Markets had been known to have a role in determining prices and allocating resources. They now determined who won the rewards of innovation and the quantum of the rewards. They tested the success or failure of the innovation.

Competition aided the innovation process. The rewards for innovation depended on the innovator's margin of priority in time over imitators and successors. The process of gaining the rewards of innovative ideas took on the characteristics of a race.

This process was comparatively free of political and religious controls.

The west's system of growth required a social class with the capacity to effect innovations, with incentives or motives for innovation, with a source of ideas for innovation, and with immunity from interference by the formidable social forces opposed to change, growth and innovation. It was the merchant class that turned from trading to manufacturing.

## **THE TECHNOLOGY LINK TO ECONOMIC DEVELOPMENT**

Pass Lessons and Future Imperatives – Edited by Susan U. Raymond, Annals of the New York Academy of Sciences, Vol. 787. 1996

*Knowledge, information, and innovation now surpass most natural resource endowments as strategic economic resources for development. Throughout the world, private and public sectors seek to chart directions for future growth using this triad as a guiding constellation..... All three (knowledge, information and innovation) imply a central role for technology in economics. Moreover, the compelling forces of global competition, the pace of technological advance, the shifting roles of government, and the decentralization of economic and regulatory functions all require that tomorrow's successful economic strategies (whether for firms, cities, states, nations) be premised on a high technological content, a skilled and flexible workforce, and an adaptation and resilience within and among economic institutions.*

### Relationship between technology and economic development

- a) Technological capacity is a critical aspect of productivity in virtually all industries
- b) High technology companies themselves are a growing determinant of the health of overall industrial development;
- c) Technology is also the base of infrastructure upon which all economic sectors depend;
- d) Technological skills, and technology as a mode of instruction, are critical aspects of a competitive workforce.

These dimensions together combine to point the way to the necessary components of future prosperity for any nation. They also define critical problems and opportunities in public policy that will set the stage for, or raise barriers to, that prosperity.

### Four dimensions into which the technology-economic development link may be discussed

- a) Technology and nation's economy  
What are the nation's strengths and weaknesses, particularly with regard to technological resources.
- b) Innovation and entrepreneurship  
What are the conditions needed to encourage the development of new technology? How might the nation create and/ or improve these conditions with an eye to future growth? Do we have a core of entrepreneurs capable of innovative leadership? If not, can this core be created? Who or what may double as the entrepreneurial group?
- c) Industries: Science, Technology and Growth:  
What are the nation's leading S&T industries today? How will the nation fare in attracting, developing, and retaining these industries and improving their technological edge in the future?

d) Labour: Technology and human resources

What will be the key skills needed to work in the nation's high-tech industries in the future? What resources are available to widely impart these skills today? And what initiatives will be necessary in the future to ensure that the nation's labour force advances apace with its technology economy?

There is a necessity for a partnership of private sector initiative, university excellence, and government policy as the engine needed to fuel a robust relationship between technology and economic growth.

## **SECOND BEST DEVELOPMENT STRATEGY**

### **Harmonious Development**

The key to development is the right application and combination of factor proportion – capital, labour, raw materials – and their balanced growth over time.

By using technology most suited to their factor proportions, almost all LDCs have the means required to make development possible without outside help. If the technology problem is not solved, exhortations about unity, hard work, appeal to non-corrupt practices, etc. are irrelevant.

No country starts the development process with lots of capital resources. Most countries have more labour and natural resources. These are usually combined with the little capital to create wealth. Wealth is accumulated as capital. The growth in capital stock changes the factor endowment proportions which, in turn, should lead to a continuous evolution of the technology towards an eventual capital-biased strategy of development.

Technology is in essence the science of factor combination of a given area. For harmonious development technology must seek the full utilization of its factor endowment. In other words, technology is not of universal application. Capital intensive projects in LDCs lead to uneven development because they allow the LDCs to finance these activities when their factor endowments do not justify them. Capital becomes scarce in the economy. Also, a psychological gap is created in a people when development activities in their country are outside their financial and 'technical' reach. No take-off can occur in an economy which has idle resources because these constitute heavy deadweight on the aircraft of development.

Given the right conditions, development happens spontaneously. The activities of men who are at the centre of development elude rational planning. Development occurs through the consistent efforts of individuals trying, modifying, testing, discarding and replacing. Development occurs through wasted and inefficiency but the tread is always finding new levels after each change has worked itself out. Planning should concentrate on:

- a) How to initiate and set up a programme of indigenous technology on a national scale
- b) The economic and political incentives needed for the massive exploitation of this technology
- c) Regulating the new concomitant economic and social relationships based on suitable political ideology.

### **Non-harmonious/Second-best development strategy**

Current strategy/model of development

- a) Consigns all initiative to government;
- b) Takes away the people's role in the process of development. The people become passive onlookers.

The capital accumulation model may not be suited to the conditions and needs of LDCs. Capital is the scarce factor in most LDCs and the adoption of the capital accumulation model necessitates support from outside. This support manifest itself in the form of import dependency, i.e. the use mainly imported equipment and machinery, intermediate inputs and

raw materials in the economy's development. Import dependency in an underdeveloped environment poses staggering limitations for economic growth and modernisation.

- I) The generally low technological sophistication of the Ghanaian and African environment has meant that there has been a chronic shortage of skills to repair maintain the imported equipment, and Ghana has been famous for being littered with a myriad of machines and equipment which have been used for half their life span and abandoned for lack of repair and maintenance;
- II) The lack of repair and maintenance capability has necessitated the importation of machines and equipment at more frequent intervals than had been expected, thus raising the cost of industrial production, i.e. there is accelerated depreciation and loss of capital equipment;
- III) Modern industry, whether of the ISI or FDI variety forges strong ties with foreign suppliers of technology because, admittedly, they are much more reliable and can guarantee continuity in supplies. Risk averse local entrepreneurs feel more comfortable in this environment. But that inhibits endogenous technological development;
- IV) There is very little scope, willingness or the technical ability for substituting local raw materials for imported materials; and because of this, there has been little attempt at transforming domestic resources into new products;
- V) Our undue dependence on imported technology means that we cannot rely on local S & T base for information on how to expand industrial activities;
- VI) The dependence on imported technology, foreign technology suppliers, and foreign direct investment exacts a huge cost in transfers of profits, interests, royalties, technical assistance fees, salaries and other financial inducements paid to foreign personnel, both from local entrepreneurs and from TNC subsidiaries to their headquarters;
- VII) Increased and continuous production is dependent on increased and continuous inflow of export proceeds and/or foreign capital to purchase intermediate inputs and spare parts – an uncertain expectation for a modern-day primary product exporting underdeveloped country;
- VIII) The massive imports of machinery and equipment has brought in modern technology rather than technological knowledge, which is what we need for a national endogenous development;
- IX) Tax rebates to encourage foreign investments;
- X) The overpricing of foreign goods for construction and other industrial projects;
- XI) Problems with management techniques and personnel and with an inexperienced civil service;
- XII) Assets which operate below optimum efficiency, e.g. power failures, faulty telephone systems, etc.

#### Foreign investment

The much touted benefits of foreign investment may be illusory

- a) The employment potential of modern capital intensive industry is negligible;
- b) The technology transferred is know-how, i.e. how to operate and maintain capital equipment and facilities. This merely sets the stage for further importation of equipment, machinery, gadgets from the advanced countries.

#### Developmental effect of these leakages and costs

1. Present development efforts make only marginal contributions to the economies of LDCs. A unit of capital invested in an LDC yields much less benefit because of these leakages than the same investment would yield if invested in an advanced economy.

2. Capital projects, whether they are factories, dams or refineries, have no leverage effect. They do not enthuse and incentivize the local people to try out new techniques and ideas. Instead, they heighten the psychological barrier between traditional and modern techniques. An LDC thus propped up by foreign capital and expertise is likely to be increasingly dependent on outside help. Such a development thus ignores one of the major requirements for true economic development, namely, that the development process must be invigorated and vitalized from inside by the actual peoples of the area. This is a variants of the theory of the ‘big push’, and for the economy to take off, a critical minimum of internal energy must be developed through the action of a people from within – in the same way as propulsion by internal energy is crucial to get jet engines off the ground.
3. Building infrastructure for development is capital intensive. Capital is the result of a transformation involving labour and natural resources utilizing technology. Therefore, the beginning of development should be the development of capital through this interaction of labour and natural resources. Thus, a pattern of development that starts by investing in a large infrastructure cannot provide a base for development but a means for underutilizing or rejecting human and other resources in the development process. This pattern cannot be called development.
4. Factor proportions differentiate the advanced industrial economies from LDCs. Capital is the least scarce factor in developed countries; labour and/or natural resources are least scarce in LDCs. This difference should imply very different development strategies. The case for ‘big push’ rests on the fact that to get the maximum impact from any development effort, the full utilization of the least scarce factor(s) has to be involved. In LDCs, it is only when these factors are operating together with scarce resources that one can expect a take-off.
5. Development has to be balanced, meaning factor proportion endowment of the economy – to avoid distortions and leakages. Distortions occur when wages and salaries differ as between agriculture and industry, i.e. between labour intensive and capital intensive sectors. Distortions occur when there is under utilisation of factors, i.e. some activities are overcrowded (in urban areas) while others are starved (in rural areas). Labour forced to move to the urban areas because of economic activities may be underutilized. Distortions occur when development is pioneered by a relatively small elite of foreigners. They cannot achieve a take-off. Local people do not see this kind of development as belonging to them. People tend to be psychologically more used to the factor proportions which derive from their immediate environment. Local entrepreneurs feel estranged from exploiting the opportunities that arise from this type of development. The claimed scarcity of entrepreneurs in LDCs arises from the use of technologies and ideas which are out of reach of their psychological scope.

When we have capital intensive projects of FDI, and we do not produce the capital and machinery in the country, the multiplier effect from the appropriate capital goods industry is enjoyed in the country of origin. The cost of outside services for the imported assets – construction by foreign experts, consultancy, shipping and insurance – are all paid to foreign sources.

Capital intensive method of development is responsible for shortages, inflation and other distortions. (Shortages occur routinely the energy and water supply, and the supply of infrastructure). Supply of goods and services depends on availability of foreign exchange to import raw materials and/or intermediate inputs. Foreign exchange availability depends on agricultural exports for most LDCs. But

- a) Agriculture is usually neglected in the most LDC development strategies
- b) Declining TOT for agricultural exports

- c) Fluctuating prices for agricultural exports.

#### The psychology of foreign aid

There is a psychology of aid which tends to undermine the very essence of economic development by building up the attitude 'that someone else is better qualified to and can do it for me'. Aid of whatever variety can sap a people's energy and initiative, even though in principle everybody expects that aid should be complementary to local initiative. The use of foreign experts enables LDCs to escape their problems, but the consequence is to induce a whole population into a state of apathy arising from a feeling of mental impotence. That is what one expects when major economic activities which attract respect and publicity are manned entirely by foreigners. Local people are afraid to try out their own new ideas – afraid to making mistakes

#### **Excerpts from ASIAN INDUSTRIALISATION AND AFRICA Edited by Howard Stein, Macmillan Press Ltd., 1995**

Article by E. Wayne Nafziger --- Japan's Industrial Development 1868-1939

1. The Act of 1872 established a national system of education stressing scientific and technological education rather than skills for the junior civil service like schools in the C 19<sup>th</sup> and early C 20<sup>th</sup> European colonies in Africa.
2. Japan banned foreign investment between 1968 and 1899, preferring to hire thousands of foreigners to adapt and improve technology under ministry of local business direction.
3. The Meiji government invested large amounts in infrastructure – telegraphs, postal service, water supply, coastal shipping, ports, harbours, bridges, lighthouses, river improvements, railways, electricity, gas, and technical research.
4. The experience of Japan indicates the clear advantages of domestic political and economic control – a contrast to the African scene where colonialism and neo-colonialism from late C 19<sup>th</sup> reigned up to 1979-80 where OECD (Europe and Japan) have used the IMF and World Bank to retain economic suzerainty.
5. Technological Borrowing – Japan did not rely on foreign aid; she paid the full cost of acquiring foreign technical expertise. Between 1868 and 1892, the central government directed technological transfer by spending 1.5% of its total expenditures for foreign employees, and an additional 0.4% for expenses to send more than 4000 students and government officials for training and education abroad. The ministry of industry, which invested in heavy and chemical industries, mining, and infrastructure, employed almost 1000 foreign experts, advisors, and teacher from 1870 to 1885 to establish agricultural experiment stations to introduce Western farming methods and products and model factories to transfer technology to light industry. Ministry of finance drew on 125 experts to help set up a modern monetary system and introduce corporate business organisation. Other ministries and public enterprises hired almost 5,000 and the private sector about 12,500f foreigners during 1870-99.
6. Japan learned, as Africa is yet to learn, that importing replicas from western institutions and capital intensive technology may exacerbate unemployment and B/P problems if the local country lacks the capital and skills needed. Foreign techniques were modified to save capital, or conform to local conditions and factor proportions. For Meiji Japan, foreigners were teachers, transferring technology and other knowledge, not more or less permanent teachers as in Africa.

7. Restricting DFI was costly, but that way, Japan avoided the foreign restrictions placed on the transfer of technical knowledge, and continuing technological dependence on foreign sources that African countries face.
8. Meiji Japan borrowed from, and modified techniques and approaches from the advanced Western countries. Africa will find it more difficult to imitate Japan because Africa is far more technologically backward to the technologically advanced economies today than Japan was relative to the west in the late C 19<sup>th</sup>. Africa will also find it more difficult to import foreign technical experts not only because of remuneration but because the multinational Corporation has somehow obviated the need for it. The MNC itself introduces technology that flies right in the face of factor proportions of the host country.
9. Neither can African countries compete as Japan did in the C 19<sup>th</sup>. For Africa now has to compete in an integrated global economy against MNCs who operate markets that are international oligopolies with competition among few sellers whose pricing decisions are interdependent. They benefit from monopoly advantages such as patents, technical knowledge, superior managerial and marketing skills, and better access to capital markets, economies of large-scale production, and cost savings from vertical integration.
10. **Education**  
Japan's primary enrolment rate, 28.1% in 1873, reached virtually 100% by 1911. The government made serious efforts to expand primary and vocational education and stress Western scientific and technical education. Education in Sub-Saharan Africa then and even now provides the intellectual skills necessary for clerks, administrative assistants, and non-commissioned officers, and operative for the colonial government, army, or European firms **but not for engineers, scientists, farm and industrial managers, entrepreneurs, and government executives and technicians.**
11. In Sub-Saharan Africa, primary enrolment rate (as % of children aged 6-11) rose from 36 in 1960 to 79% in 1980 before falling to 67% in 1990. Secondary enrolment rate was 3% in 1960, 16% in 1980, and 18% in 1989. Low literacy and primary enrolment rates have impeded labour enskillment and economic growth in Africa

### **Import-Substitution and Export-Oriented: Southeast Asian Countries**

While the bottom-up approaches were being tried in Latin America and especially in Africa, countries of Southeast Asia were applying the principles of the old development model to their modernisation. In a study of the manufacture of textiles/garments and electronics products in six Southeast Asian countries, it was found that the governments of Korea and Taiwan adopted the interventionist industrialisation strategy of import substitution in the early 1950s and shifted to export promotion in the late 1950s. Malaysia and Thailand also embarked on import substitution industrialisation in the late 1950s and turned to export promotion in the late 1960s. Indonesia adopted export oriented industrialisation only in the 1980s, and post-unification Vietnam shifted to explicit export-led industrialisation in the context of the liberalisation measures associated with its transition from a socialist to a market economy. What factors accounted for the success of the process of industrial development?

#### **The Environment**

Because export-oriented investment is risky, the state provided direction, adopted measures to cushion losses, supported acquisition of skills.

The state provided a stable political and economic environment. The state invested heavily in education and assured basic literacy through provision of secondary schooling, and saw to the training of engineers, scientists and skilled technicians. The state invested in infrastructure –

power, transport, and telecommunication. There were also selective interventions. The state at various times undertook economic and trade policy reforms designed to remove biases against export-led investment, and to attract foreign direct investment.

### **The Process of Industrialisation**

All the countries started with domestic market-led industrial development. Virtually all of them made use of the cheap labour that then existed in the region, but they all recognised that cheap labour was ephemeral in a world of rising domestic real wages and the threat of competition from countries where wages were even lower.

To remain competitive they concentrated on training the work force and upgrading their engineering, managerial and technical skills “aimed at increasing productivity, reducing defects, raising quality, learning to cope with increasingly more sophisticated outputs and production processes and diminishing product delivery times” (Ganiatsos, Ernst, Mytelka). These skills, including the managerial skills were diffused among the indigenous working population, and may left the existing export-oriented enterprises, whether foreign or joint-venture, to establish their own companies. Of course, in order to survive they had to be very progressive minded – continuously investing in more modern plants and exploring new process and product ideas and markets. Where local capabilities are weak as in plant design, process engineering and selection of technology, expatriate personnel foreign experts have been brought in to impart their skills so that local personnel have been able gradually to acquire the relevant skills – process which is going on presently in all the countries except perhaps in Korea and Taiwan. In virtually all countries these firms have networked with local firms for the supply of engineering and design consultancy services or for subcontracting. The firms have also learned to make the adaptation necessary to meet the very exacting requirements of overseas markets.

### **New Thinking on Import-Substitution and Export-Led Industrialisation**

It is now generally agreed that the only counties that made a success of this strategy of development were the East Asian countries of Singapore, Taiwan and the Republic of Korea. First of all, these countries which are numbered among the newly industrialising countries (NICs) followed the strategy temporarily in order to expand the size of the domestic market and build up industrial skills. Singapore went through the import-substitution phase between 1965 and 1967. Protection of domestic industries was considered temporary and was made subject to periodic reviews; quotas were superseded by tariffs, and the number of commodities subject to quotas and tariffs were reduced and the remaining tariffs lowered after 1967 (Balassa, 1982, 40). Korea and Taiwan completed the phase of import substitution that entailed the replacement of imports of non-durable consumer goods and their principal direct inputs by domestic production around 1960 and thereafter adopted-oriented policies. Secondly, considerations of comparative advantage guided their selection of industries to build at home, and these changed as their accumulated expertise, experience, resources and incomes changed. Initially and for a long time, comparative advantage lay in the use of labour intensive production technology in the manufacturing export sector. This mode of production greatly increased labour productivity at the same time as it produced rapid employment growth. Thirdly, all three countries changed to predominantly export-oriented industrialisation strategies even though they had raised incomes high enough to support a fairly wild range of industries (ibid).

Singapore offered incentives, mainly reduction in tax rates on profits, taxes royalties, licenses and technical assistance, to attract a large number of multinational companies, which set up higher technology industries to cater to regional, and world markets. The country went as far as exempting company income from taxation if the companies used the money for equity financing of manufacturing industry in the country (ibid).

Taiwan and Korea liberalised import controls through reducing tariff rates on commodities, and the advanced depend required for ordinary imports; and promoted exportation through rebates of customs duties and on commodity tax on imported raw material, through reduction of taxable income from export earnings, and the retention of foreign exchange earnings to import raw materials and machinery. They established export promotion facilities including export inspection, managerial, technical and trade consultation services, and market research. Duty-free export processing zone were established, and the investment climate was improved by liberalising laws and regulations governing investment; and rapid financial growth was ensured by offering a positive real rate of return to savers, and move which greatly increased net private savings (ibid., 212-350).

These policies were made even more effective by other favourable conditions in the countries, namely a highly educated, disciplined, skilled, and trainable labour force; a significant amount of US foreign aid for Taiwan in the 1950's and early 1960's which increased the country's foreign exchange resources and made possible the importation of essential inputs in production; foreign investment in all the countries which helped to develop indigenous technological capability and provide access to the markets of industrial countries; strong development-oriented governments able to take far reaching decisions and see to their implementation; a sophisticated social and economic overhead capital; and a dynamic entrepreneurial class. The countries plus Hong Kong which did not go through a period of import-substitution development but proceeded directly to the export-oriented strategy, and Japan have exerted a pull on the rest of the East and Southeast Asian countries, notably Malaysia, Thailand, Indonesia and the Philippines so that in their own individual ways they adopted export-oriented policies in the 1970's, and now being called the 'near nics'. Japan and the 'nics' are the largest foreign investors in the 'near nics'. The latter countries also took advantage of the improved access to private international financial markets in the 1970's but wisely withdrew and avoided the debt problem of the 1980, except the Philippines. One notable feature of each of the 'near nics' is the existence of the Chinese population, which provides the economic, and risk taking leadership. However, the countries, especially the Philippines and Indonesia, have not completely shed off the underdeveloped status. In those countries, there is an abundance of poorly educated and unskilled workers, and there is a shortage of technical, managerial and professional manpower. The important point, though, is that they are caught up as it were, in a development-oriented environment.