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A Schumpeterian theory of
underdevelopment –
a contradiction in terms?

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Abstract*

The aim of this paper is to show that the dynamics of Schumpeterian economics, in addition to explain the creation of wealth, also implicitly contain the elements of a theory of relative poverty. It is argued that the German tradition of economics, of which Schumpeter is a part, has always encompassed the necessary elements of a theory of *uneven* growth. List, Marx, and Schumpeter have all emphasized different aspects of this uneven growth. This contrasts sharply with the Anglo-Saxon tradition which, particularly since the 1890's, has produced theories of growth and trade which imply an even, converging distribution of world activity and income.

The organization of the paper is as follows: **Section 1** contrasts Anglo-Saxon and German economic traditions from the point of view of theories of *uneven* growth vs. theories of *even* growth. **Section 2** raises the question of the relationship between technical change and underdevelopment, and identifies two key mechanisms which create uneven distribution of the gains from technical change. The two are I) The consequences of the extremely uneven advance of the 'technological frontier', and II) *Classical* and *Collusive* spreads of technological gains. **Section 3** shows how these mechanisms work to create three cases of 'Schumpeterian Underdevelopment' in the Caribbean. In **Section 4** it is claimed that the factors identified in Section 2 may create conflicting interests between the two parts that every individual plays in economic life, that of *producer* and that of *consumer*. It is claimed that these are identical only under the assumptions of neo-classical economics and in special cases of what is labelled *symmetrical* trade. Finally, in **Section 5**, the policy conclusions of these findings are discussed. It is showed how the conflicting interests of man-the-consumer and man-the-producer, produced by *classical* and *collusive* spreads of technical change, were central to the creation of US industrial policy in the early 19th Century.

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1. Anglo-Saxon vs. German economics: Theories of even vs. theories of uneven growth

Friedrich List, Karl Marx and Joseph Alois Schumpeter are the German economists who have had major influence on economic policy outside the German-speaking area. The theories of Marx and Schumpeter are deeply rooted in the traditions of the German Historical School of economics, and although Friedrich List antedates what is generally seen as the starting point of the older historical school, his approach is clearly that of a 'proto-historical school'. The roots of this line of thought go back to the times of the cameralists, at least as far back as Wilhelm von Hornick's work of 1684.¹ All three authors - List, Marx, and Schumpeter - share an essentially very similar dynamic view of economic development. This is especially evident when their theories are contrasted with the Anglo-Saxon economic traditions, the tradition which provides the foundation for our present world economic order. The German tradition produces theories of *uneven* growth, Anglo-Saxon neo-classical economics tends to produce theories of *even* growth. This is particularly true when neo-classical economics is translated into international economic policy, and the finer points of the theory are lost. In terms of economic policy, a key difference between these two bodies of thought is that whereas in Anglo-Saxon economic theory the location of production in space is not an issue, this location is often crucial to economic wealth in German economic policy. Anglo-Saxon economics is primarily a theory of *exchange*, whereas German economic theory to a much larger extent involves *production*. In German theory, differences in circumstances of production translate into differences in wealth.

Prior to Adam Smith many English theories of growth were also theories of uneven growth. I have argued elsewhere that the mercantilist view was that economic growth was *activity-specific*, that it took place in some economic activities and not in others.² It should also be noted that in 19th Century United States the economic theories which served as guidance for economic policy (as opposed to what was often thought at 'ivy league' universities), were 'German-type' theories. Friedrich List's prolonged stay in the United States in the 1820's clearly provided a cross-fertilisation of German theories and US Hamiltonian thoughts on the matter of economic policy. Similarly, in Japan, the economic theories adopted after the Meiji restoration were specifically based on German *nationalökonomische* theories, openly rejecting the *cosmopolitical* aspects of English economic theory.

¹ *Österreich über alles wann es nur will*, Nürnberg, 1684. This important work appeared in 16 editions between 1684 and 1784, all in German. This was considerably more than the most famous English economists at the time. Mun's *England's Treasure* from 1664 reached 8 editions in English and 6 in translations, Child's *Brief Observations* of 1690 reached 10 editions in English and 2 translations. For a study of economic policy-making under the 'proto-historical' school after Hornick, see Tribe, Keith, *Governing Economy. The Reformation of German Economic Discourse 1750-1840*. Cambridge, Cambridge University Press, 1988.

² Reinert, Erik S. 'Catching-up from way behind, A Third World view perspective on first world history', in Fagerberg, Jan et.al., *Catching Up, Falling Behind an Forging Ahead. The Dynamics of Technology, Trade, and Growth*, London, Edward Elgar, 1994.

The similarities of Marx and Schumpeter are readily admitted by Schumpeter, most clearly so in the foreword to the Japanese version of the *Theorie der wirtschaftlichen Entwicklung*. Schumpeter explains here how he was looking for ‘a source of energy within the economic system, that would of itself disrupt any equilibrium that might be attained ...It was not clear to me at the outset ..that the idea and the aim are exactly the same as the idea and the aim which underlie the teachings of Karl Marx’.³ The similarities in the two systems are, Schumpeter says, ‘obliterated by a very wide difference in general outlook.’⁴ Many authors, starting in the late 1940’s, have compared Marx and Schumpeter. A bibliography of ‘Works on Schumpeter’ lists 77 works treating both Marx and Schumpeter (of a total of 1916 entries).⁵

In spite of their similarities, the ‘wide difference in general outlook’ between the two economists has continued with their modern disciples. A special division of labour of Schumpeter’s *creative destruction* has taken place between Schumpeterians and Marxists: The Schumpeterians explain the *creative* part, e.g. the growth of the English cotton textile industry, whereas the Marxists concentrate on the *destructive* part: The bones of the Bengali weavers, the previous suppliers of the same product to the English and Indian markets, ‘whitening the plains of India’. Schumpeterians produce theories of *development*, Marxists produce theories of *underdevelopment*. Both these sets of theories, however, intrinsically contain the elements of the opposite view. Marxian economics (as distinguished from Marxist economics) produces a dynamic theory of development⁶, albeit uneven, where the ‘bourgeoisie cannot exist without constantly revolutionising the instruments of production’. The uneven distribution of wealth is kept up by, among other factors, the imperfect competition produced by constant innovations.

A similar picture of Schumpeter’s *dynamic income inequalities* can be found in his *Theory of Economic Development*: Schumpeter recognises that ‘the upper strata of society are like hotels which are always full of people, but people who are forever changing.’⁷ As opposed to Marx, Schumpeter’s interest in the fate of the groups not living in this upper class hotel, however, is very limited. The key factor which unites Marx and Schumpeter - and distinguishes both these approaches from Anglo-Saxon economic theory - is that theirs is essentially a theory of *uneven growth*. For this reason, in any ‘German-type’ theoretical approach, problems of income distribution are implicit in the system, whereas this type of problems is non-existent at the paradigm level in Anglo-Saxon economics.

If we compare the world of today with the world in which Marx wrote, two important developments have taken place, especially since World War II. These

³ Reproduced in English in Clemence, Richard V. *Essays of J.A. Schumpeter*, Cambridge, Mass., Addison-Wesley Press, 1951, p. 160.

⁴ *ibid.*, p. 161.

⁵ Augello, Massimo M., *Joseph Alois Schumpeter. A Reference Guide*, Berlin, Springer-Verlag, 1990. The largest numbers of publications comparing Marx and Schumpeter have appeared in Italian books and journals, a total of 23. The second most frequent nation is Japan.

⁶ For a comment on this see e.g. Rosenberg, Nathan, ‘Marx on the economic role of science’, in his *Perspectives of Technology*, Cambridge, Cambridge University Press, 1976, pp. 126-138.

⁷ Schumpeter, Joseph A. *The Theory of Economic Development*, Cambridge, Mass., Harvard University Press, 1934, p. 156. This part is not found in the first German edition, Leipzig, Duncker & Humblot, 1912.

developments have changed the geographical setting of distributional problems, from being essentially *national* to being *international* problems: i) Successful mechanisms for income redistribution in most industrialized countries have alleviated national problems of income distribution, and ii) ‘globalisation’ has substituted the present international division of labour for the previous national one, also in manufacturing goods, thus moving the distributional conflicts more and more from the national (between ‘classes’) to the international arena (between nations). National problems of income distribution, in the sense of poverty alleviation, have to a large extent been solved in the industrial countries, particularly in Europe and Japan. The enormous costs involved in this redistribution with the industrial nations are rarely debated, least of all on a theoretical level.

Since Adam Smith, Anglo-Saxon economics has been *cosmopolitical* economy. In English classical theory, as opposed to in economic policy, distributional issues were not a core issue. In classical and neo-classical theory, national and international distributive issues have been assumed away through the inclusion of simplifying assumptions. Over time these simplifications crystallised into the two key assumptions of neo-classical economics: perfect information and the absence of increasing returns. It is the inclusion of these two assumptions - both counterfactual - which have created the blind spot of neo-classical economics: the inability to account for the extremely different levels of development between the nations of the world. With the assumptions of perfect information and constant return to scale in place, any theory of economic growth automatically becomes a theory of *even* growth. These assumptions seem to remove the reasons for a Smithian ‘division of labour’: differences in human knowledge and fixed costs in specialised machinery. Perfect information seems difficult to reconcile with a notion of ‘human capital’. Constant returns to scale seems difficult to reconcile with the existence of fixed costs, which create varying degrees of ‘minimum efficient size’. These two assumptions - implicit or explicit - turned English economics into a *cosmopolitical* school of economics. As a reaction to this, 19th Century German economics became *Nationalökonomie* and *Volkswirtschaft* - terms which sticks to this very day both in Germany and in Scandinavia. Here, less restrictive assumptions were made.

What Marx and Schumpeter have in common are strong roots in the German Historical School of Economics. These roots are not clear to the observer of today, for at least two reasons. First of all the German historical tradition is hardly known outside the German-speaking world, very few works have been translated⁸ and secondly the followers of both Schumpeter and Marx have, for different reasons, consciously and/or unconsciously cultivated the originality of their leading man. In the communist block Marx’s doctrine was cultivated as being the product of what in another religion is called an ‘immaculate conception’: Marx could not be seen as having borrowed from despicable bourgeois economists. The fact is that Marx borrowed heavily from the founder of the German historical school, Wilhelm Roscher.⁹

⁸ Two volumes of Wilhelm Roscher’s works were published in Chicago, 1882, and , thanks to the efforts of Prof. Jürgen Backhaus, three volumes on Werner Sombart’s work will be published this year. We should also keep in mind that not even Schumpeter’s first book, on methodology, has been translated to English, whereas there are 3 editions in Japanese.

⁹ Roscher, Wilhelm, *Die Grundlagen der Nationalökonomie*, Stuttgart, Cotta, 1854.

Together with Charles Babbage¹⁰ and Andrew Ure¹¹, whom he both quotes several times, Roscher was probably the first economist to fully understand the economics of mass production: 'He (Roscher) created the image of large-scale industry whose essential feature is increasing returns or decreasing costs.'¹² Roscher also specifically pointed to the existence of increasing returns in research. Whereas Babbage and Ure wrote specialised treatises on the economics of large-scale industry, Roscher incorporated these insights into a holistic economic theory. Roscher's work was to be the standard textbook for a generation of Germans, appearing in 26 editions. Marx differed from the rest of the German school by subscribing to Ricardo's labour theory of value, which to Roscher and to the German historical tradition was un-German and 'typically English'. The importance given to economies of scale in German economics goes back before Roscher to previous works by Hufeland¹³ and Hermann¹⁴. Roscher also refers several times to Serra, whose 1613 treatise was the first to associate national welfare with increasing returns, and national poverty with the lack of it.¹⁵

Schumpeter's originality in the Anglo-Saxon environment was clearly to a large extent also a product of the ignorance, outside Germany, of the traditions on which he built. Most Schumpeterians, especially non-Germans, would probably be surprised by a recent German book that describes Schumpeter's 1942 book *Capitalism, Socialism and Democracy*¹⁶ as essentially a reworking of a German debate which had taken place decades earlier, where, the author carefully points out, Schumpeter neither refers to the debate itself, nor to its protagonist Werner Sombart.¹⁷ (Perhaps a wise thing to do considering the year of publishing).

All of this is in sharp contrast to the Anglo-Saxon tradition. Adam Smith provided the great insight of the importance of 'division of labour', but he failed to see the organizational implications of this division of labour. Adam Smith assumed markets would continue to function as perfectly as the agricultural markets of his time. On the

¹⁰ Babbage, Charles, *On the Economy of Machinery and Manufactures*, London, Charles Knight, 1832.

¹¹ Ure, Andrew, *The Philosophy of Manufactures, or, an exposition of the scientific, moral, and commercial economy of the factory system of Great Britain*, London, Charles Knight, 1835.

¹² Streissler, Erich W., *Increasing Returns and the Prospects of Small-scale Enterprise*, Paper presented at the Sixth Annual Heilbronn Symposium in Economics and the Social Sciences, 'Wilhelm Roscher (1817-1894). A Centenary Reappraisal', June 1994, p. 1.

¹³ Hufeland, Gottlieb, *Neue Grundlegung der Staatswirthschaftskunst, durch Prüfung und Berichtigung ihrer Hauptbegriffe von Gut, Werth, Pries, Geld und Volksvermögen mit ununterbrochener Rücksicht auf die bisherigen Systeme*, Giessen and Wetlar, Tasche & Müller, 1807.

¹⁴ Hermann, Friedrich B. W., *Staatswirthschaftliche Untersuchungen*, München, A. Weber, 1832.

¹⁴ Stuttgart, Cotta, 1854.

¹⁵ Serra, Antonio, *Breve trattato delle cause che possono far abbondare li regni d'oro e argento dove non sono miniere*, Napoli, Lazzaro Scoriggio, 1613.

¹⁶ New York, Harper.

¹⁷ 'Ohne auf Sombart und die allgemeine Literatur der zwanziger und dreißiger Jahre hinzuweisen, bot Schumpeter (in *Kapitalismus, Sozialismus und Demokratie*) im wesentlichen nur daß, was bereits Jahrzehnte zuvor in den deutschen Diskussionen über die 'Zukunft der Kapitalismus' geschrieben und gesagt worden war, wobei er freilich die gesellschaftlich konservativen Folgerungen, die bei Sombart in der Forderung nach Reagrarisierung und Autarkie gipfelten, nicht übernahm.' In: Appel, Michael, *Werner Sombart. Theoretiker und Historiker des modernen Kapitalismus*, Marburg, Metropolis, 1992, p. 260.

other hand, he specifically states that the lack of progress of agriculture at the time of his writing was probably due to the ‘lack of scope for the division of labour’. Adam Smith goes half way to seeing the connection between ‘lack of division of labour’ and perfect competition, but not quite. The differences in organisation of production has been left out in neo-classical theory, as has any follow-up of the consequences of various degrees of ‘division of labour’. Neo-classical economics is essentially a theory of the exchange of goods already produced, taking no account of the diversity of conditions of production and their influence on pricing behaviour. Neo-classical theory is, it seems, a theory which cannot accommodate for the existence of fixed costs, since these create increasing returns. We are, seemingly, still victims of Adam Smith’s inability to see the necessary organizational consequences of his key insight of the importance of division of labour. The division of labour will create firms organized around the combining of tasks into which the manufacturing, assembly, and sale of a final product have been divided. The fixed costs invested in machinery and equipment will by definition create a minimum efficient size, increasing returns, barriers to entry, and imperfect competition. The understanding of this is traditionally part of German economics, but, since the early 1890’s definitely not of the paradigm of Anglo-Saxon economics.¹⁸

For this reason, a most significant long-term pattern of economic policy emerges: ‘German-type’ theories of uneven growth dominated the take-off stage of all industrialized countries, including England from the late 1400’s up until the late 1800’s. The economic policies of these nations have gradually changed to ‘English-type’ theories as they, one by one, reached the ‘technological frontier’. At that point increasing returns in industrial activities turn from being a barrier to growth (for nations not engaged in such activities), into a mechanism where international trade is beneficial to both trading partners. In the early stages, increasing returns creates a barrier to development and is an obstacle, as the economy industrialises the same factor becomes an important ally. As a consequence of this, to a poor country with an economy based on natural resources, free trade was seen as a poverty-trap (due to the existence of diminishing returns and perfect competition). To a nation engaged in increasing return activities, the existence of these factors become yet another reason for free trade¹⁹. In a successful strategy, increasing returns must be part of economic growth theory in the early take-off stage. Therefore a ‘German-type’ theory has always been present at an early stage in all industrialized countries. Once a nation is established in a virtuous circle of increasing return activities and dynamic imperfect competition, leaving increasing returns out of economic theory is not harmful on a short-term basis. Consequently, the successful former laggard countries all convert to Anglo-Saxon type theories - especially with respect to international trade - without any short-term damage.

In Anglo-Saxon economics all economic activities are ‘alike’, they are all equally suited to promote national welfare. In German economic theory some economic activities are ‘better’ than others: Those exhibiting dynamic imperfect competition

¹⁸ For a recent treatment of the consequences of ‘division of labour’ in the history of economics, see, Rosenberg, Nathan, *Exploring the Black Box. Technology, economics, and history*, Cambridge, Cambridge University Press, 1994. Chapter 2 ‘Charles Babbage: Pioneer Economist’, pp. 24-46.

¹⁹ The earliest clear statement of this is probably found in Charles King’s 1721 book, *The British Merchant or Commerce Preserv’d*, London, John Darby, 1721. 3 Vols., Vol. 1, p. 3.

produced by 'historical increasing returns'. Engaging in these 'better' activities is a necessary requirement if a country is to 'catch-up' with the leading nations of the world.

'German' economic theory has been the basis of the economic policies of the 'laggards', including England when she was a laggard. Anglo-Saxon economics has been the theory of the 'leaders' - the theory embarked upon when 'German' theory has brought a nation into international leadership. For this reason, all rich countries have attempted to export 'Anglo-Saxon' ideas, whereas they themselves have stuck to 'German' ideas. The policy of the United States imposing free trade on Japan and Latin America, while still engaged in extremely heavy-handed protection of national industry at home, is but one example. Today's *managed free trade* is an attempt to achieve the same thing: The advantages of 'German' theories for home use combined with Anglo-Saxon for the rest of the world.

The basic difference between a rich and a poor nation in the world of today, is that whereas *all* rich nations - except some small city-states - have been through a long stage of 'German' economic policy, (combining competition *and* protection) in most cases lasting at least 100 years. It is difficult to find a poor nation which has been through this stage.

2. Technological change and Schumpeterian underdevelopment

As stated in the previous section, in German economic theory, some economic activities are ‘better’ than others, in the sense that they produce dynamic technical change and increasing returns. English economic theory tended to neglect these factors, and, for this reason, for the purposes of economic growth, all economic activities became ‘alike’. This was a necessary condition for equilibrium. Increasing returns was, however, still important in the first edition, but not in the later, of Alfred Marshall’s *Principles*. Marshall, consequently, is able to give us a formula for an excellent industrial policy: ‘A tax ...on the production of goods which obey the Law of Diminishing Return, and devoting the tax to a bounty on the production of those goods with regard to which the Law of Increasing Returns acts sharply’.²⁰ This insight had to be sacrificed in later editions, since the existence of increasing returns was incompatible with equilibrium. What in Marshall’s early writings start out as a ‘Law’ (with a capital ‘L’) of increasing returns, is reduced to being a ‘tendency’ in subsequent editions, later to disappear from mainstream theory altogether with John Hicks. Today, new trade theory and new neoclassical growth theory are about to rediscover the impact of increasing (but not diminishing) returns.²¹ Their policy conclusions are no different from Marshall’s in 1890, Roscher’s in the 1850’s, or Serra’s in 1613.

Schumpeter’s dynamic system, with the role of ‘historical increasing returns’, retains the characteristics of other authors of the German school, and therefore of a system which produces uneven growth. My notion of Schumpeterian underdevelopment relates to two aspects of technological change, I and II below. Both of these mechanisms are based on the existence of increasing and diminishing returns, imperfect information, barriers to entry, and resulting imperfect competition:

I. The uneven advances of the ‘technological frontier’. It is often visualised that technological knowledge moves forward in the form of a technological ‘frontier’ of knowledge. The word ‘frontier’ conveys a notion of a fairly orderly and even progress, where a borderline is being pushed ahead, somewhat reminiscent of the ‘frontier’ being pushed from the East to the West coast in US history. I feel our understanding of wealth and poverty is hampered by this vision of an orderly ‘frontier’. The historical patterns of technological change looks more like a scatter diagram than an orderly frontier. Technical change happens very fast in some areas, dragging with them others, but in some areas the ‘frontier’ hardly moves at all for centuries. At any particular time both the search for new technologies, and technological change itself, are - in Nathan Rosenberg’s words - ‘focused’²² on

²⁰ Marshall, Alfred, *Principles of Economics*, London, Macmillan, 1890, p. 452.

²¹ An excellent survey of these models is found in Verspagen, Bart, ‘Endogenous Innovation in Neoclassical Growth Models: A Survey’, in *Journal of Macroeconomics*, Fall 1992, Vol. 14, No. 4, pp. 631-662. See also Romer, Paul M., ‘The Origins of Endogenous Growth’, in *Journal of Economic Perspectives*, Vol 8, No. 1, Winter 1994, pp. 3-22.

²² See Rosenberg, Nathan, ‘The direction of technological change: inducement mechanisms and focus devices’, Chapter 6 in *Perspectives on Technology*, Cambridge, Cambridge University Press, 1976.

specific areas of technological problems and opportunities. In the stone age, technical change was concentrated in the stone implements industry, in the bronze age in bronze implements, and in the machine age in the activities which were being mechanized. Even today, 200 years into the machine age, some activities are still not mechanized - cutting hair, picking strawberries or sewing baseballs.

'If improvements in all the arts were to take place *at the same rate*, they would obviously have no effect to alter the exchangeable value of things', said US economist Henry Vethake in 1844.²³ In a system with perfect information and constant returns to scale, the sequence of technological change makes no difference to the distribution of wealth. On the other hand, in a system with increasing and diminishing returns and imperfect competition, *choosing economic activity* becomes a crucial strategic decision. Where your activities are in the sequence of technological waves - what technological vintage they are - consequently becomes important. We shall see examples of this from the Caribbean in Section 3 of this paper. A formal model in which learning takes place at different rates in different sectors of the economy is contained in a 1988 paper by Robert Lucas.²⁴ As to the practical consequences of uneven learning, Lucas provides an unusually candid remark from a formal economist: 'The consequences for human welfare involved in questions like these are simply staggering: Once one starts to think about them, it is hard to think about anything else'.

II. The two alternative ways in which the benefits from technical change spread.

Under perfect competition, the advances from technical change will spread in the economy in the form of lowered prices to the end user. This is the assumption made by both Adam Smith and David Ricardo.²⁵ In an earlier paper²⁶ I have argued that the benefits from technological change always will be distributed in one of the following ways:

- *To the customers* buying the product in the form of lowered prices an/or better quality. I call this the **classical** form of distribution of the gains from technological change, because Adam Smith and David Ricardo both state that this will be the effect of technical improvements. This mechanism will operate when conditions of production and markets are similar to those assumed in neo-classical theory.
- *To the owners and workers* in the producing firm, and later to the *government* of the producing country in the form of higher taxable income. I call this the **collusive** form of distribution of the gains from technical change, because the forces of the producing country (capital, labour, and government) in practice - although not as a conspiracy - 'collude' to appropriate these gains. This mechanism will operate if the technical change is accompanied by the creation of barriers to entry, where increasing returns is a key mechanism.

²³ Vethake, Henry, *Principles of Political Economy*, 2nd. edition, Philadelphia, J.W. Moore, 1844. p. 95.

²⁴ Lucas, Robert, 'On the Mechanisms of Economic Development', *Journal of Monetary Economics*, Vol. 22, 1988, pp. 3-42.

²⁵ This is discussed in Reinert, 'Catching up...', op. cit.

²⁶ Ibid.

A typical example of the *collusive* form would be January 5, 1914, when Henry Ford increased the wages of his workers from an average of 2,34 dollars for a nine-hour day to 5 dollars for an eight-hour day.²⁷ A typical example of a *classical* distribution would be the employment of bar code readers in supermarkets. This technological improvement would not show up as higher wages to the store staff. Harvard's Zwi Griliches uses this case to show what I call 'invisible economic growth', those cost-cuts and quality improvements which never show up in any statistics: 'For example, more and more supermarkets have installed bar code readers in their checkout lines, making them faster and more accurate. Yet these gains to consumers do not show up in the government's numbers.'²⁸ For a closer comparison of the two modes see Reinert, op. cit.

Most technical changes contains an element of both *classical* and *collusive* distribution of the benefits from technical change. What we measure as economic growth is largely the *collusive* mode. *Collusive* technical change is accompanied by the creation of higher barriers to entry, more imperfect competition, and it normally affects the minimum efficient size of an operation. The effects of *classical* technical change 'fall through' the producing organization without changing the structure of the firm or the industry, and is visible mainly as lower prices of the end product. This *classical* technical change does not affect the bargaining power of labour. *Classical* technical change takes place under conditions that do not strongly violate the neo-classical assumptions of perfect competition, and is most frequently found in agriculture and in the traditional service sector. Typically an invention initially creates a temporary monopoly which allows for *collusive* spread of benefits, but as the technique in question becomes commonplace, its benefits will spread more and more as lower prices, not as higher wages and profits. Table 1 illustrates the characteristics of classical and collusive spread of technical change.

²⁷ For an account of this see Raff, Daniel M. R., 'Wage Determination Theory and the Five-Dollar Day at Ford', in *The Journal of Economic History*, Vol. 43, No. 2 (June 1988), p. 387.

²⁸ 'America's New Growth Economy', *International Business Week*, May 16, 1994, s. 47.

TABLE 1.

CHARACTERISTICS OF THE 2 MODES OF DIFFUSION OF PRODUCTIVITY IMPROVEMENTS

<u>CHARACTERISTICS OF MODE</u>	<u>THE COLLUSIVE MODE</u>	<u>THE CLASSICAL MODE</u>
DIVISIBILITY OF INVESTMENTS	INDIVISIBLE, COMES IN <i>CHUNKS</i>	DIVISIBLE
DEGREE OF PERFECT INFORMATION	IMPERFECT (E.G. PATENTS, INTERNAL R&D)	PERFECT (COMPETITIVE MARKET FOR TECHNOLOGY ITSELF)
SOURCE OF TECHNOLOGY FROM USER COMPANY POINT OF VIEW	INTERNAL, OR EXTERNAL IN <i>BIG CHUNKS</i> = HIGH DEGREE OF ECONOMIES OF SCALE	EXTERNAL
BARRIERS TO ENTRY	INCREASE	NO CHANGE
INDUSTRY STRUCTURE	INCREASES CONCENTRATION	NEUTRAL
ECONOMIES OF SCALE	INCREASE	NO CHANGE
MARKET SHARES	VERY IMPORTANT	UNIMPORTANT
<u>HOW BENEFITS SPREAD</u>		
GNP AS MEASURED	HIGHLY VISIBLE	TENDS NOT TO APPEAR ('SOLOW-PARADOXES')
PROFIT LEVEL	INCREASES STAKES: POSSIBILITY FOR LARGER PROFITS OR LOSSES	NO CHANGE
MONETARY WAGES	INCREASE	NO CHANGE
REAL WAGES (NATIONALLY)	INCREASE	INCREASE
PRICE LEVEL	NO CHANGE	DECREASES
TERMS OF TRADE	NO CHANGE	URNS <i>AGAINST</i> INDUSTRY EXPERIENCING TECHNOLOGICAL PROGRESS
EXAMPLES OF INNOVATIONS IN THE 2 GROUPS	NEW PHARMACEUTICALS, MAIN-FRAME COMPUTER PRODUCTION, AUTOMOTIVE PAINT PRODUCTION	ELECTRICITY, TELEPHONES, SEWING MACHINES, USE OF PCs, DISPERSION PAINT PRODUCTION, CONTAINERS
<u>WHERE FOUND</u>	MAINLY IN INDUSTRY, IN RECENT PRODUCTS AND PROCESSES	IN PRIMARY AND TERTIARY INDUSTRIES, <i>USE</i> OF NEW BASIC TECHNOLOGIES, MATURE INDUSTRY

In a typical industrialized country 70 % of GNP are payments to factor labour, i.e. wages. What we measure historically as growth in GNP is to a large extent the impact of technical change on monetary wages. *Classical* technological change tends to leave fewer traces. When, as in the last decade, an increasing percentage of GNP growth takes place in the service sector - following Petty's Law - the *classical* type spread of technical change becomes more dominant in the economy. Because of the decentralised nature of service production (the classical definition is that a service product must be produced where it is consumed), economies of *scope* in multi-site operations is more of a success factor in the service industry than traditional economies of *scale*, typical of a fordist-type factory. This, combined with the use of technology to *replace* and not to *enhance* labour skills in the traditional service sector, allows for a *classical* rather than a *collusive* spread of the benefits of technical change in this sector. An important part of the explanation of the 'Solow paradox' - that computers are visible everywhere except in government statistics - clearly lies in the combination of the huge measurement problems in the service sector combined with the *classical* spread of technological change in this area.

The two phenomena - the classical spread of technological gains and the measurement problems - are closely intertwined. A considerable portion of the lower growth in what we measure as GNP in most industrialized countries over the last decade, is most likely the result of increasing employment in the traditional service sector which produces 'invisible growth' (lowered transaction costs in grocery purchases due to checkout scanners, etc. etc.) However, the subject of this paper is not the measurement problems of GNP caused by technical change, but the effects of technical change on income distribution among nations.

In the collective bargaining process, the *Collusive* Mode is traditionally seen as being 'fair'. If a company improves its labour productivity, part of the benefits of this should go to labour *in that firm*. The phenomena which I describe as the *classical* and *collusive* modes of distributing the proceeds from technical change were thoroughly discussed in a 'comprehensive series of investigations of the relation of the distribution of income to economic progress'²⁹ by the Brookings Institution. These investigations lead to the publishing of a series of books between 1935 and 1940, several of which directly address the way benefits from technological change spread in the economy.³⁰ In the framework of the Brookings Institution, my *classical* spread is called 'distributing income through price reductions' and the *collusive* spread is called 'distributing income through raising money wages'. In general the Brookings studies find that, although the *classical* way of distributing gains from technological progress is the preferred one from the point of view of society as a whole, the imperfectly competitive markets for goods and labour in industry make this impossible to achieve. These studies point, however, to the serious problems of income distribution caused (within the USA) by the *collusive* spread of the benefits from technical change in industry and the *classical* spread in agriculture. In a paragraph entitled 'The conflict between wage earners and farmers' Moulton has the

²⁹ Bell, Spurgeon, *Productivity, Wages, and National Income*, Washington DC, The Brookings Institution, 1940, p. 3.

³⁰ Among them are Bell, op.cit., Moulton, Harold, G., *Income and Economic Progress*, Washington DC, The Brookings Institution, 1935, and Nourse, Edwin and Horace Drury, *Industrial Price Policies and Economic Progress*, Washington DC, The Brookings Institution, 1938.

following comments as to the national income distribution resulting from *collusive spread* of gains. We ask the reader also to study the paragraph substituting the US farmers for a Third World nation producing raw materials or mature industrial products under conditions of near-perfect competition:

⇒ 'In considering the price-reduction method (our *classical* mode) as an alternative to wage increases (our *collusive* mode) attention should also be called to a broad social consequence of the latter that has apparently seldom been recognized. The disparities in the income and purchasing power of the industrial and agricultural populations resulting from the wage increasing method create a basic maladjustment between two great divisions of our economic life and imposes a serious barrier to economic progress. It is apparent that there would be a growing disparity in the economic position of the agricultural and industrial populations even if prices of industrial products showed no tendency to rise as wages rose³¹: the income of the urban population would be increasing while that of the agricultural population would be stationary. In practice there is, however, a tendency for industrial prices to rise somewhat as wages are increased, and the consequence is that the purchasing power of the farm tends to be actually reduced. The consequent inability of the agricultural population to buy ever increasing quantities of industrial products limits the scale on which industrial establishments can operate.

The struggle to obtain higher living standards through the medium of higher money wages has been the cause of a long and deep-seated conflict between the agricultural and urban population. The people of the cities have fought for higher wages even though it has meant somewhat higher prices for industrial products. The farmers have long fought for lower prices on the commodities they have to buy. The struggle underlies the so-called granger movement of the seventies; it explains the traditional opposition of the agricultural South to high protective tariffs; and it lies at the basis of farmer opposition to trusts, monopolies, and combinations in all their forms.'³²

These paragraphs describe the problems of income distribution between two groups within the same nation who both produce at what was then the *technological frontier*: Both the US farmers and the US industrial population were the most productive in the world. Yet, one group got rich and the other group stayed poor. At about the same time another US author tried to explain the same phenomenon from a leftist point of view in a book called *Why Farmers are Poor*.³³ I would argue that the reason for this poverty of the world's most efficient farmers on the world's probably most fertile soil is this:

³¹ This statement should be compared with the terms-of-trade debate following the Prebisch-Singer argument in the early 1950's. Moulton shows a mechanism where one group grows rich and the other poor with *Terms of Trade unchanged. My collusive spread* and Moulton's argument reflect the views of Singer rather than Prebisch, see Singer's 1949 paper 'The Distribution of Gains between Investing and Borrowing Countries'. This paper is reproduced in Singer, Hans, *International Development. Growth and Change*, New York, McGraw-Hill, 1964, pp. 161-172.

³² Moulton, *op.cit.*, pp. 124-125.

³³ Rochester, Anna, *Why Farmers are Poor. The Agricultural Crisis in the United States*, New York, International Publishers, 1940.

⇒ The productivity increases of the farmers are taken out in the form of lowered prices, in the *classical* way, whereas the productivity increases of their trading partners producing industrial goods are taken out *collusively*, in the form of higher wages. In a neo-classical world of perfect information and no economies of scale, this would of course not be a problem, because the individual farmers would all produce the tractors and all the other industrial implements in their own back yard without any loss of efficiency compared to industrial production. In real life, however, the farmers were facing high barriers to entry - the 'perfect information and constant returns to scale option' is of course non-existent. The farmers of the United States in the 1930's suffered from 'Schumpeterian Underdevelopment'.

If we now place these two groups in two different countries, an industrial country and an agricultural country, and open for trade, we would have achieved a much bigger gap in the standard of living than the one which so much worried the Brookings Institution in the late 1930's. Placing the two groups of producers in two different countries would have eliminated important distributive mechanisms that existed within the United States. Migration of surplus labour from the farms to the industrial districts as farming demanded less labour and more capital was an important distributive mechanism, as was the pressure from alternative employment in the cities on farm wages. The government tax base was much larger in the cities and in industrial areas, so infrastructure, schools, and other government services in the farming areas were clearly heavily subsidised by the industrial districts. Last but not least, the farmers, in spite of their steadily declining numbers, did have political power. Moulton mentions the granger movement which started just after the Civil War, whose activities served as the basis for later legislation affecting income distribution within the United States: Railroad and public utility regulations, antitrust laws and measures establishing a postal savings bank and parcel post on government hands. Our basic point is this:

⇒ Had the industrial population and the agrarian population in the United States been living in two different nations, we would have found a deeply impoverished agricultural nation and an extremely wealthy industrial nation. Both would have been the world's most efficient, but one would still have suffered from Schumpeterian Underdevelopment.

This is but one example. Using other examples from the Caribbean later in the paper, I shall argue that wealth is not caused by relative efficiency but by *imperfect competition*. From the point of view both of an individual and of a nation, the choice of economic activity is much more important than the degree of efficiency. There is, for nations as well as for individuals, an optimisation process available.

As Moulton correctly points out, the poverty of the farmer hampers the wealth development of the rich. The lack of purchasing power of the farmers hampers the growth of the industrialists. This same argument is found in a different context as an argument for the protection of US manufacturing industries in the 1820's: If the United States are allowed to build their own industries, British trade will not suffer. In the long run the increase of national demand caused by industrialisation of the US will increase and upgrade the US demand for British industrial goods. Increasing the size of the cake for the weaker trading partner benefits everybody. The same argument is again found in the EU of 1994: the implicit social contract of the EU

aims at 'competitiveness' to industry, simultaneously with a 'social cohesion' created by increasingly massive *collusive* transfers to the non-industrial regions. Also here the argument is that the poor must get transfers in order to create markets for industry.

Inside the rich economies themselves lies a perfect illustration of the mechanisms of uneven economic growth: imperfect competition and *collusive* spread of benefits from technical change on the one hand and perfect competition and *classical* spread of the benefits from technical change on the other. The problem is that this mechanism is never discussed on a theoretical level. The rich countries, like the EU, simply pay and protect the farmers as a matter of political necessity without ever asking *why*. Inefficiency is clearly not the problem; on the contrary the farmers of the industrialized world are so efficient that, in spite of their low numbers, they produce more than the industrialized countries can consume, causing huge payments to be made for those who keep their land uncultivated and huge amounts of food to be given as 'aid' to poor countries, causing the collapse of farm prices there.

The high-tech industries and, in general, those activities working under imperfect competition are the national wage leaders. This causes the phenomenon of 'industry rent' in labour economics: certain industries, usually the same industries all over the world, pay much higher wages than others. The size of the industry rent, however, varies with the political setting (big in the US, small in Scandinavia), although the rank of the industries tends to stay the same. The industries working under what Schumpeter called 'historical increasing return' become the wage leaders, while the traditional service sectors are 'wage followers'. If we assume that the price of capital is relatively constant in the long run, this upward pressure on the wage level from the 'wage-leading industries' will make labour-saving devices more profitable also in other economic activities. The upward pressure on wages from wage-leaders can be seen as an initial turn on the screw of virtuous circles which makes labour a more costly factor of production than capital, triggering an upward spiral of continuous substitution of capital and new technologies for labour-intensive technologies - the very essence of economic growth.

One definition of a poor country is that - to its average inhabitants - everything is expensive, except labour. Because of this, the costs of traditional inexportable services vary wildly. A haircut in industrialized Europe cost 20 times more than the same quality haircut in Peru or Bolivia. This is because in industrialized countries, the traditional service sector collusively shares in the 'industry rent'.

The distribution of wealth between rich and poor *within* a nation will, as Moulton pointed out, also affect the size of the market and the scale of operations of the increasing return sector. The failure to raise wages of large groups of population will cause a vicious circle with sub-optimal scale of industrial production and lack of national competition to stall growth, even if a nation is in the 'right' industry. Several Latin American countries seem to fall in this category.

3. Three cases of Schumpeterian underdevelopment in the Caribbean

The case of serious maldistribution of income in the United States between the agricultural and industrial sectors - both the world's most efficient at the time - opens up for an understanding that being wealthy is not so much a matter of being efficient, it is more *what one chooses to be efficient in*. Schumpeterian underdevelopment happens if a nation chooses to be efficient *in the wrong industry*. This mechanism works similarly as with individuals: the most efficient dishwasher in the country has a much lower income than the most efficient lawyer.

There are two mechanisms which come together to cause this: The uneven advance of the phenomenon which by a misnomer is called The Technological Frontier, and the *collusive vs. classical* spread of the benefits from technical change. These mechanisms are able to operate because of what Schumpeter called 'historical increasing returns' - the fact that the technological change that we measure as economic growth has been accompanied by higher fixed costs creating greater economies of scale. This 'visible' (as opposed to the often invisible growth in the traditional service sector) technological change consequently operates under very imperfect competition protected by two important sets of barriers to entry: Scale-based and knowledge-based, which interact and cumulate in creating Myrdalian vicious circles.

One important feature of neo-classical economics is that, under its standard assumptions, all economic activities become 'alike'. In neo-classical economics, a faster technological change in one industry than in another is neutralised by instant adjustment, provided by 'perfect information', 'perfect foresight', 'constant returns to scale' and 'perfect information'. In real life the existence of huge differences in knowledge and information, 'bounded vision' and huge increasing returns to scale combine to chain nations to the trajectories they have historically embarked upon, or in the case of the Caribbean, those they *have been* embarked upon. In the following examples we shall observe how, in the case of three Caribbean islands, Schumpeterian underdevelopment develops. In all three cases the choice of economic activity, rather than the efficiency, determines wealth or poverty.

3.1 Cuban counterpoint of tobacco and sugar

In 1940 the foremost Cuban social scientist in this century, Fernando Ortiz, published a book³⁴ with a fascinating account of how Cuban society and history have been shaped in very different ways by Tobacco and Sugar, 'two gigantic plants, two members of the vegetable kingdom which both flourish in Cuba and are both perfectly adapted, climatically and ecologically, to the country. The territory of Cuba

³⁴ *Contrapunteo Cubano del Tabaco y el Azúcar*, Havana, Jesus Montero 1940. There is another edition in Biblioteca Ayacucho, Caracas, 1978. The book was published in English in 1947 by Knopf, superbly translated by Harriet de Onís. The well-known anthropologist Bronislaw Malinowski provided an introduction to the English edition. Knopf and Onís were also behind the English publication of most of the best Latin American fiction at the time. *Cuban Counterpoint. Tobacco and Sugar*, New York, Alfred A. Knopf, 1947.

has in its different zones the best land for the cultivation of both plants. And the same happens in the combinations of the climate with the chemistry of the soil.’³⁵

From an economic point of view, Cuba clearly has an absolute advantage in the production of both crops. But to Cuba, one crop - tobacco - produced wealth, the other -sugar - poverty. The counterpoint between tobacco and sugar is a parallel to the uneven wealth creation we witnessed in a previous paragraph, between the industrial and the agricultural sectors in the United States. Both in the US and Cuban cases we are studying *the most advanced production in the world*, both in the activities which produced wealth and the activities which produced poverty. The difference is here that we are studying two agricultural products which both are being industrialized. We must, then, go beyond the standard categorisations of agriculture as being ‘bad’ and industry as being ‘good’, to find the mechanisms at work.

In Cuban society Tobacco was the hero, Sugar the villain. Tobacco - predominantly grown on the Western part of the island - created a middle class, a free bourgeoisie. Sugar - grown on the rest of the island - created two classes of people: masters and slaves. The cultivation and picking of tobacco created a demand for specialised skills: Tobacco leaves were harvested individually, and the market price of the product depended on the skill of the picker. Tobacco bred skills, individuality, and modest wealth. ‘Sugar was an anonymous industry, the mass labor of slaves or gangs of hired workmen, under the supervision of capital’s overseers’.³⁶ Where tobacco required skill, care and judgement, sugar only required brute force in cutting the cane. Tobacco was individuality and division of labour, sugar was bulk and commodity. Tobacco carries its origins with it as a brand name, ‘sugar comes to the world without a last name, like a slave.’³⁷ Tobacco is stable prices, sugar is wildly fluctuating prices. A skilled tobacco selector can distinguish seventy or eighty different shades of tobacco, but all saccharose is the same. Timing is crucial in the harvesting of tobacco, for the cutting of cane timing is not important. Tobacco is delicately cut leaf by leaf with a small sharp knife, making sure that the rest of the plant survives. The sugar plant is brutally slashed with a big machete. Working with sugar is a trade, working with tobacco an art.

As a result of this, Ortiz says, the tobacco worker is not only wealthier than the destitute sugar workers, ‘he is better mannered and more intelligent’.³⁸ Tobacco is wealth and intelligence, sugar is poverty and ignorance. Sugar is foreign capital, tobacco is predominantly national capital. ‘In the history of Cuba sugar represents Spanish absolutism; tobacco, the native liberators..Sugar has always stood for foreign intervention’.³⁹‘Sugar has always preferred slave labour; tobacco free men. Sugar brought in Negroes by force; tobacco encouraged the voluntary immigration of white men.’⁴⁰

³⁵ Ibid., English edition, p. 7.

³⁶ Ibid., p. 65.

³⁷ Ibid., p. 42.

³⁸ Ibid., p. 40.

³⁹ Ibid., p. 71.

⁴⁰ Ibid., p. 81.

Differences in barriers to entry are clearly a key factor producing the differences in production and marketing which created the Cuban counterpoint. Cuban tobacco was one of the few cases of brand name products from the Third World. Cuba had an absolute advantage in the world in both products, but one brought wealth and the other poverty. This is a parallel case to the Brookings Institution study from the United States in the 1930s, which showed a US 'counterpoint' similar to the Cuban: The United States had both the world's most efficient farmers and the world's most efficient industry. But - the farmers stayed poor and the industrial workers got rich. Both in the United States and in Cuba world level efficiency lead to wealth for those who specialised in one product, and poverty to those who specialised in another. We are facing cases of *classical* spread of the gains from technological change in the case of the US farmer and the Cuban sugar workers, and *collusive* spread in the case of US industry and Cuban tobacco production. It is also worth noting that in spite of a much larger technological change in sugar refining than in cigar making, the cigar makers were consistently wealthier than their sugar-producing colleagues. From the point of view of the nation involved, imperfect competition and no technical change is infinitely better than technical change and perfect competition. Farming in the US and sugar on Cuba lead to Schumpeterian underdevelopment, industry and tobacco did not.

Fifty years after the original publication of *Cuban Counterpoint*, a Cuban author in exile dedicated his book *La Isla que se repite* - 'The Island which Repeats itself' - to its author, Fernando Ortíz.⁴¹ The title of the book says it all: In spite of a change in political paradigm, the qualities inherent in sugar production - not only on Cuba but anywhere - continue to shape Cuba and determine its economic faith.

Two years ago two US political scientists and Latinamericanists published a study of the political and economic structure of two Caribbean islands: The Dominican Republic and Jamaica.⁴² In spite of the extremely different historical and administrative backgrounds of the two islands; one coming from the Spanish tradition and one from the English, the authors found both nations had very similar political and economic structures and the same set of problems. Again, their conclusion is, without referring to Ortíz, that the fate of both islands is shaped by the economic forces of sugar production. No matter your past, producing the same thing will make you alike.

Many modern studies point to the extreme poverty of the world's most efficient sugar producers. The titles indicate the social concerns which prompted their publication: *The Hunger Crop. Poverty and the Sugar Industry*⁴³ and *Bitter Sugar*.⁴⁴ The policies of the industrialized countries subsidising their own inefficient sugar production - beet sugar in Europe and cane sugar in the US - plus the increased competition from corn-based sweeteners just add to the desolation of this 'lock-in effect'. In 1985 'The Economist' dedicated a cover story - 'Enslaved by Subsidies' -

⁴¹ Benitez Rojo, Antonio, *La isla que se repite*, Hanover, New Hampshire, Ediciones del Norte, 1989.

⁴² Hillman, Richard S. and Thomas J. D'Agostino, *Distant Neighbours in the Caribbean. The Dominican Republic and Jamaica in Comparative Perspective*, New York, Praeger, 1992.

⁴³ Coote, Belinda, *The Hunger Crop. Poverty and the Sugar Industry*. Oxford, Oxfam, 1987.

⁴⁴ Lemoine, Maurice, *Bitter Sugar*, London, Zed Books, 1985.

to the sugar policies of the industrialized nations, calling it 'a case study in taxing the rich to ruin the poor'.⁴⁵

Studying the sugar industry makes one understand the intuitive approach to industrial policy used by the early mercantilists. The starting point of the British ascent to world power was the economic policy of the Tudors. In 1485 Henry VII embarked on a programme to convert England from being a producer of raw wool to being a producer of woollen textiles. His logic stemmed from his travels in France and England, where he observed that all wool producers were poor, whereas all producers of woollen cloth were rich. We could call it 'Henry VII's counterpoint'.

3.2 Haiti - economic counterpoint in baseballs and golf balls

Today the unchallenged position at the bottom of the sugar hierarchy is held by the Haitian seasonal workers in the sugar fields of the Dominican Republic.⁴⁶ But, The Republic of Haiti also dominates the world market for a manufactured product: Baseballs, produced mainly for the US market, provide a classical case of Schumpeterian underdevelopment.

Economists make sense of the enormous variations of industries by placing them in groups according to a standard industrial classification. Even seemingly homogeneous groups, however, may contain enormous diversity in the economic conditions individual products create in the country of production. The world's most efficient golf ball producers are located in industrialized countries and make a normal industrial wage of 9 dollars per hour. The world's most efficient baseball producers are in Haiti, working 10 hours per day for an hourly wage of 30 US cents. The wage ratio between the two groups of workers, both in the same industry and both being the most efficient in the world, is about 30 to 1.

Why is there no factor price equalization with the industry producing balls for various sports? The technological explanation is: The machine age has not yet reached the production of baseballs, they have to be hand-sown, even in the United States. The currents of creative destruction have not yet penetrated this little industry. The baseball-producing industry is a relic from an otherwise extinct techno-economic paradigm, to use the terms of Perez/Freeman.

As in sugar production, the *characteristics of the product* 'base-balls' itself contains the elements of poverty and underdevelopment. No new skills are developed because there is no *demand* for new skills. No learning-by-doing takes place in Haiti, because there is no learning taking place in baseball production *anywhere*. The Haitians are not working with capital and with machines, because not even all the capital of the United States has managed to mechanize base-ball production. The mercantilists told us that economic growth was *activity-specific* - it happened in some industries and not in others. And they were right.

When Haiti sells base-balls to the United States and buys golf balls back, one hour of labour in the United States is exchanged for 30 hours of labour in Haiti. This in spite

⁴⁵ *The Economist*, August 10, 1985.

⁴⁶ See Lemoine, op.cit.

of the fact that US base ball sewers are *not* more efficient than the Haitians. This are the ‘unequal exchange’ effects of Schumpeterian Underdevelopment.

3.3 The Dominican Republic and technological change in pyjamas production

The Dominican Republic scores considerably higher in terms of GNP per capita than Haiti. As we have seen, The Dominican Republic can afford to import labour which is even cheaper than her own for the *zafra* - the sugar harvest. Over the last decade more than 400.000 new manufacturing jobs have come to the Dominican Republic. Most people expected economic growth and higher wages to result from manufacturing, after all, wasn't the wealth of the US built on manufacturing ?

Much to the surprise of everybody, the 400.000 manufacturing jobs did not increase welfare to any measurable extent. The explanation lies in the way the market mechanisms of Schumpeterian underdevelopment assigns production processes with and without technical change. The Dominican Republic produces garments, made from imported fabrics. A pyjamas bought in the US 15 years ago would have a label reading: ‘Fabric made in the US, cut and assembled in the Dominican Republic.’ About 10 years ago, the labels were changed. They now read: ‘Fabric made **and cut** in the US, assembled in the Dominican Republic’. What had happened ?

About 10 years ago a new technology - laser cutting - hit the garment industry. As a result of this, the labour content in this operation fell dramatically, and the cost of labour was no longer a strategic factor in the cost of the final product. The cutting operation was therefore taken back to the United States when the new technology appeared.

As long as the frontier of technological change moves forward extremely unevenly in a world with imperfect competition, free trade will lead to Schumpeterian Underdevelopment in parts of the world economy. Production processes with no technological development, with no creative destruction, will, by the logic of the market, be farmed out to the poor nations. In some cases, where a huge closed market absorbs one small and relatively poor nation, this ‘farming out’ of products with less technical change may have beneficial effects to both trading partners. The inclusion of small and relatively poor Portugal in the EU can prove beneficial to all, just as the import of a few Third World citizens to wash dishes in the First World can be to the benefit of all parties.⁴⁷ However, the number of poor compared to the number of rich in the world today, makes this ‘absorption’ to make the poor nations rich not a viable strategy. The extremely high costs faced by West Germany in absorbing relatively the rich and much smaller East Germany testifies to this.

⁴⁷ In the summer of 1994, the Tamil refugees in Switzerland, who are threatened with expulsion, have one political ally: The association of restaurant owners who depend on them for dishwashing.

4. The circular flow and the two economic roles of man

If the world is a stage where each must play his part, we are all - in an economic sense - playing two different roles: That of the producer and that of the consumer. On the one hand we produce goods (man the producer), and on the other hand we consume goods (man the consumer) which are exchanged for the ones we produce. What counts as GNP is limited to production where these roles are *separated*, where the producer is not the consumer. The economics profession has abdicated from the study of situations where the roles of producer and consumer of a good are played by the same person. These cases of household economies have been left to economic anthropology: It is the *exchange*, and not the production, which is at the very heart of modern economics.

A special feature of neoclassical economics is the perfect harmony of interest between these two roles of man (or woman). Man the producer never has any conflict of interests with his other self - man the consumer. Individual human beings, during their life span, face a similar situation as that of society as a whole. But: Individuals have possibilities to optimise their strategies, a path which today is difficult for a nation. For the individual, who consciously or unconsciously selects a profession, the two roles of consumer and producer imply trade-offs. The individual can embark on a path which optimises his income. One can easily imagine man-the-consumer rejecting the suggestions of his producer-self that present consumption has to be reduced in order to attend law school. A reasoned discussion between man-the-consumer and man-the-producer, both inhabiting the same individual, may lead to the conclusion that the individual in question would be better off quitting the job as a dishwasher and go to law school, i.e. foregoing consumption now for more prestige and consumption in the future. Among thousands of different professions, individuals are able to *optimise* their situation. Normally this optimisation carries with it a trade-off between present and future income. This optimisation between professions is clearly recognized also by economists, on a practical level or in the guise of 'human capital'. Certainly no economists, not even traditional trade theorists, tell their children to stick to the job washing dishes because 'factor-price equalization is just around the corner' - the time when people washing dishes will make the same amount of money as lawyers. Indeed, it would be easy to produce a convincing Ricardian-style argument for the would-be lawyer, that the world would be richer if he sticks to washing dishes and does not try to become a lawyer.

Why does this *optimisation* option apply to individuals and not to nation ? We all agree that our children should rather become lawyers than wash dishes in a restaurant. Why is it conceptually impossible for an economist to extend this argument to apply to a nation specialising in dishwashing trading with a nation of lawyers ? Why is a certain path obviously an *optimising* path to an individual, but not to a collection of individuals like a region or nation ? Why do economists make opposite recommendations to one individual than to a *group* of individuals facing the same options ? Why would we never dream of recommending to nations whose part

in the international division of labour is similar to washing dishes that they can optimise by changing into a different profession ?

The answer is relatively simple: Neo-classical theory has abstracted from - assumed as not existing - all the characteristics which distinguishes a job of washing dishes from the job of being a lawyer. Under conditions of perfect competition and perfect information with constant returns to scale, lawyers and dishwashers would make the same salaries. Under these conditions all individuals in an economy would have the same salaries, no trade-offs and no optimisations would be possible.

Individual wage differences as well as differences in industry profitability are caused by a package of factors which carry the collective label 'barriers to entry' - fixed costs and increasing returns, imperfect competition, speed of technological change, and many others. In previous STEP-Reports, I have published The Quality Index of Economic Activities.⁴⁸ The Quality Index represents a continuum from perfect competition to monopoly, on which any economic activity conceptually can be plotted. The score on this index reflects the degree to which an activity can support a high wage for the individual and a high standard of living for the nation exporting this good. In other words, the score of the Quality Index show the degree of 'industry rent' available to the individual or to the nation. Schumpeter's 'historical increasing returns' - the interplay of scale and technological change over time - is an important factor creating high-quality activities.⁴⁹ Schumpeterian Underdevelopment is the result of a specialisation, within the international division of labour, in activities with a low score on the Quality Index of economic activities.

The national strategies under mercantilism and cameralism shared the view of economic growth being *activity-specific*, it took place in some economic activities and not in others.⁵⁰ In order to get rich, a nation had to engage in the activities which gave the nation *productive powers* or *nationale Produktivkraft*, the equivalent of today's 'competitiveness'.⁵¹ In practice, this was the core of English economic policy from the late 1400's and in the economic policies of France (starting in the 1600's), Germany (from its cameralist past and with the Zollverein in the 1830's), the US (starting in 1820), and Japan (after the Meiji Restoration). In practical terms this meant engaging in the economic activities which at any point in time were in the process of being mechanized, through bounties, subsidies and protection. By singling out the activities which at any point in time were in the process of being mechanized, this 'mercantilist' trade policy developed a 'national innovation system'. Seen from a slightly different angle, the slope of the national learning curves were maximised. The scale effects and the barriers to entry created in these activities secured the creation of 'industry rent', which produced the gap in standards of living between the European countries and their colonies. The exceptions were formed by the 'white' colonies - those which in the early UN statistics were grouped under the heading

⁴⁸ E.g. in 'Catching up', op. cit.

⁴⁹ The 'Quality Index' can be seen as an attempt to explain Robert Reich's 'high quality jobs' and 'low quality jobs'. A nation specialising in 'low quality jobs' - like Haiti - will suffer from Schumpeterian Underdevelopment.

⁵⁰ See Reinert, 'Catching up from way behind...', op. cit.

⁵¹ This is discussed in Reinert, Erik, 'Competitiveness and its Predecessors - a 500 year Cross-national Perspective', STEP-Report No. 3/94, Oslo, STEP-Group, 1994.

‘areas of recent settlement’. These nations followed the former strategies of the metropolis countries, protecting and supporting local industry even from that of the mother country.

The Ricardian trade theory excludes all the factors which cause ‘industry rent’. Our personal ‘gut feelings’ when we give our children or others advice on what profession to seek takes the industry rents in our own economies into account. When we analyse the relationship between nations, this tacit knowledge is automatically blocked off, and we return to Ricardo and a world where all the factors creating uneven wealth within a nation are assumed not to exist. But, why are Ricardo and Samuelson able to convince us that a nation of dishwashers will be equally rich as a nation of lawyers when we intuitively know that each individual lawyer will be much richer than each individual person making a living washing dishes?

In a world where the division of labour causes different degrees of imperfect competition, scale effects and - in general - a different market value on different types of knowledge, an uneven income distribution is bound to be found. It is not the existence of increasing returns and barriers to entry *per se* that causes this maldistribution, but the fact that **different economic activities embody these characteristics to varying degrees**. Relative wealth and poverty are created by the *asymmetry* between different degrees of imperfect competition, not by imperfect competition in and of itself. In the very hypothetical case that all activities had the same degree of imperfect information and increasing returns, we could still have an even income distribution. On the Quality Index this would correspond to persons or nations trading in professions with the same score on the quality index - the case of the lawyer going to the doctor. This case was specifically recognised in the most important work on ‘national strategy’ in 18th century England, when Charles King explicitly lists among ‘good trade’ the exchange of manufactured goods for other manufactured goods⁵². Paul Krugman’s conversion from free-trade scepticism after he rediscovered increasing returns - and consequently an important mechanism of uneven development - in the late 70’s⁵³ to advocating free trade across the board today⁵⁴ seems to be based on this ‘special case’: When nations trade at the same degree of increasing returns - or at the same degree of imperfect information for that matter - the existence of increasing returns and imperfect information is correctly seen as *an additional argument for free trade*. This is, however, only a special case - e.g. that of Germany and France trading large cars, or that of the lawyer visiting the doctor: Both benefit mutually from the specialization of the other (essentially from the saving of fixed costs and from having better information), and income distribution is not affected. This case - lawyers and doctors exchanging services in activities with the same score on the Quality Index - we shall refer to as *symmetrical* trade. However, if two nations previously under autarky, both consisting of lawyers and people washing dishes, suddenly open up for trade in a way that one country

⁵² See Charles King, 1721, op. cit.

⁵³ Krugman, Paul, ‘Increasing Returns, Monopolistic Competition, and International Trade’, in *Journal of International Economics*, Vol. 9, No. 4, November 1979, pp. 464-479, and ‘Trade, Accumulation, and Uneven Development’, in *Journal of Development Economics*, Vol. 8, 1981, pp. 149-161.

⁵⁴ See e.g. his *Peddling Prosperity. Economic Sense and Nonsense in the Age of Diminished Expectations.*, New York, Norton, 1994.

specialises in legal matters and the other specialises in washing dishes, we have the case of an *asymmetrical* specialization which will have serious effects on income distribution: One nation will be much richer than before and one will be much poorer. This, in a very simplified form, is what has caused the GNP per capita in Eastern Europe to fall between 30 and 50 % in 3 years. This is what Friedrich List saw happening in France after the fall of Napoleon, and what converted him from being a free trader to being a promoter of industrialisation and of the somewhat vague concept of *Nationaler Produktivkraft*, normally as ill-defined as the concept of 'competitiveness' today.

The nation in the losing end of this deal, the nation who is specialising in the activity with no 'historical increasing returns' and no 'industry rent', will be poor. Adam Smith's 'division of labour' is free of distributional effects on income only when all the economic activities created by the division of tasks are 'alike', when they have the same degree of scale effects, imperfect information, barriers to entry, etc. The spectrum of economic activities which surrounds us is clearly extremely divergent in terms of these characteristics, and consequently an increasing division of labour also opens up for increasing divergence of income levels, both inside nations and between nations.

The specialization in activities not containing Schumpeterian 'creative destruction' and consequently not enjoying the industry rent which comes with it, leads to what I call 'Schumpeterian Underdevelopment'. This is distinguished from 'classical underdevelopment' because the nations suffering from 'Schumpeterian underdevelopment' are participating in the international division of labour. The Shipibo Indians of the Amazon live with 'classical underdevelopment', whereas the baseball producers, pyjamas sewers, and sugar producers in the Caribbean suffer from 'Schumpeterian Underdevelopment'. Their activities either a) suffer from little technical change and, in the case of sugar, from diminishing returns, or b) suffer from perfect competition which causes technical improvements to be reflected as falling prices on the world market, not as higher national wages, profits and tax base, or c) from a combination of both.

5. Schumpeterian underdevelopment: Policy conclusions past and present

The rediscovery of the effects of increasing returns in new trade theory and new growth theory are made without any references to the economic thinking and to economic policies of past centuries. The new theories open up for an understanding of uneven growth, but they are hardly translated to practical policy, least of all in the policies of the First World towards the Third World, which is where they would have had the most impact. The editor of the Papers and Proceedings of the 1993 Annual Meeting of the American Economic Association appropriately heads the section on new trade theory: 'Free Trade: A Loss of (Theoretical) Nerve?'⁵⁵

One basic reason for this is the unwillingness to test the theoretical models in economics with observable economic facts. The practical relevance of a theoretical economic model is hardly ever tested with actual observations of how the world economy operates. Paul Krugman's 1981 paper, quoted in the previous section, actually contains a relevant description of how international trade creates wealth on one side and poverty on the other. Without knowing it, Krugman rediscovered and mathematised the principle 19th century argument for protection of industry which made his own country rich. This is only one of Krugman's models. Another - early - model is in 'a clever paper on interstellar trade, where goods are transported from one stellar system to another at speeds close to that of light; the resulting relativistic correction to time entails different interest rates in different frames of reference.'⁵⁶ One of these theories is very important to human welfare, the other is not. In which of these categories does Paul Samuelson's proof of *factor price equalisation* belong - the serious one or the irrelevant and clever one ? In the institutions which are responsible for Third World development, the proof of *factor-price equalisation* with free trade seems to be taken as a foundation for economic policy. A verification of the economic history of the industrialised world shows that factor-price equalisation probably should be relegated to the same category as Krugman's paper on interstellar relativistic trade. As long as verification in the real world is not part of economic modelling - and cleverness and not relevance tends to be a main criterion for success - these theories are all part of what essentially is a purely theoretical intellectual game. On one level, there is nothing wrong with this. Playing simulation games, like chess, is perfectly legitimate. Problems arise only if the general public, in particular those responsible for the economic policy of the Third World, are led to believe that there is any direct relationship between economic modelling and what goes on in the world economy.

Here the laments of Colin Clark, in the foreword to his 1940 book *The Conditions of Economic Progress* are even more valid now than at the time of his writing:

⁵⁵ American Economic Review, Vol. 83., No. 2, May 1993, p. iv.

⁵⁶ Dixit, Avinash, 'In Honor of Paul Krugman: Winner of the John Bates Clark Medal', in *Journal of Economic Perspectives*, Vol. 7, No. 2, Spring 1993, p. 173.

⇒ ‘I have left the academic world with nothing but regard for the intellectual integrity and public spirit of my former colleagues in the ...Universities; but with dismay at their continued preference for the theoretical rather than the scientific approach to economic problems. Not one in a hundred - least of all those who are most anxious to proclaim the scientific nature of Economics - seem to understand what constitutes the scientific approach, namely, the careful systematisation of all observed facts, the framing of hypotheses from these facts, prediction of fresh conclusions on the basis of these hypotheses, and the testing of these conclusions against further observed facts. It would be laughable, were it not tragic, to watch the stream of books and articles, attempting to solve the exceptionally complex problems of present-day economics by theoretical arguments, often without a single reference to the observed facts of the situation.....The hard scientific discipline has yet to be learned, that all theories must be constantly tested and re-tested against observed facts, and those which prove wrong ruthlessly rejected.’⁵⁷

The observed or ‘stylized’ facts are that an increasing international division of labour is accompanied by an increasing gap in income between poor and wealthy nations, with little movement between the two groups. The same effect is found also within the EU: Larger markets require more redistribution. Every year the European Union increases the amount of money flowing through its enormous redistributive machinery, which adds to the redistribution which already absorbs around 50 % of GNP in the industrialized nations. Another key stylized fact is that economic welfare seems to be much less a product of the *efficiency* of a nation in its specialization, but much more the product of the *choice* of economic activity. The cases where nations are efficient in their production compared to world ‘best-practice’, but are still poor, I have labelled Schumpeterian Underdevelopment.

The policy implications which slowly emerge from new neo-classical growth theory and new trade theory are in principle not different from those of Serra, Roscher, or the early Marshall; authors writing from 1613 to 1890. These new theories rediscover the essence of mercantilist industrial policy: In a world inhabited by economic activities with different potentials for raising national income, there are **optimising** paths. These insights are being used in the industrial policies of the First World, but they are absent from the policy of the First World towards the Second (previously communist) and the Third World, which is where they would have the most effect.

In any country, a mediocre lawyer has a much higher income than the most efficient dishwasher in a restaurant. For a person washing dishes, studying to become a lawyer is an *optimising* path, one which will maximize future income compared to a do nothing (*laissez-faire*) option: ‘My comparative advantage in society, due to my low wages, is to wash dishes.’ A similar situation faces nations stuck in Schumpeterian underdevelopment. Haiti, could, instead of exchanging 30 hours of labour producing baseballs for export for 1 hour of US labour in imported golf balls, optimise national welfare by producing golf balls less efficiently than the US. Even if the United States managed to stay 10 times as efficient as Haiti producing golf balls, the Haitian would, in terms of balls at today’s prices, still be 3 times as rich under autarky in golf balls than under specialisation and free trade. Under autarky in sporting balls, Haiti could improve its position compared to free trade. How would Haiti get the capital ?

⁵⁷ Clark, Colin, *The Conditions of Economic Progress*, London, Macmillan, 1940. pp. vii-viii.

Presumably the same way our law student will: Taking up a loan and paying it back from his future 'industry rent'.

In any system with differing degrees of increasing returns and a mixed pattern of *collusive* and *classical* distribution of gains from technical progress, some nations will be better off under autarky than under free trade. This is the basic reason why most of the German historical economists, including the dean of the historical school, Werner Sombart, were fundamentally critical to free trade between nations at different levels of development. The Haitian example, far from being a far-fetched theoretical argument, was at the core of the optimising path embarked upon by the United States in the 1820's: The American System of Industrial Protection, which in a period of less than 100 years made the United States into the world's powerhouse.

The economist who, next to Alexander Hamilton, was the spiritual father of the North American protection to industry, Daniel Raymond, compared the situation of individuals to that of nations: 'If an individual can do this, so may a nation'⁵⁸. The core of Raymond's argument was one of optimisation: The increased prices paid in the US for industrial products under protection would be more than compensated by the increase in wages, since industrial workers everywhere had so much higher wages than farm labour.⁵⁹ In the case of the 19th Century US economy, the trade-off between man-the-consumer and man-the-producer lead to the conclusion that, there and then, free trade was a suboptimal option. Both the Second (former communist) World and the Third present many cases of Schumpeterian Underdevelopment where there are similar optimising paths to be explored. Exploiting these requires more 'theoretical nerve' from economists, and a conscious move into what Colin Clark would have called 'factual and scientific investigations' to complement the theoretical ones which dominate today.

⁵⁸ Raymond, Daniel, *Thoughts on Political Economy*, Baltimore, Fielding Lucas, 1820, p. 115.

⁵⁹ This wage difference is well documented in Colin Clark, *op.cit.*, where he finds e.g. that in Norway agricultural wages were only 8 % of industrial wages.

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STEP-gruppen ble etablert i 1991 for å forsyne beslutningstakere med forskning knyttet til alle sider ved innovasjon og teknologisk endring, med særlig vekt på forholdet mellom innovasjon, økonomisk vekst og de samfunnsmessige omgivelser. Basis for gruppens arbeid er erkjennelsen av at utviklingen innen vitenskap og teknologi er fundamental for økonomisk vekst. Det gjenstår likevel mange uløste problemer omkring hvordan prosessen med vitenskapelig og teknologisk endring forløper, og hvordan denne prosessen får samfunnsmessige og økonomiske konsekvenser. Forståelse av denne prosessen er av stor betydning for utformingen og iverksettelsen av forsknings-, teknologi- og innovasjonspolitikken. Forskningen i STEP-gruppen er derfor sentrert omkring historiske, økonomiske, sosiologiske og organisatoriske spørsmål som er relevante for de brede feltene innovasjonspolitik og økonomisk vekst.

The STEP-group was established in 1991 to support policy-makers with research on all aspects of innovation and technological change, with particular emphasis on the relationships between innovation, economic growth and the social context. The basis of the group's work is the recognition that science, technology and innovation are fundamental to economic growth; yet there remain many unresolved problems about how the processes of scientific and technological change actually occur, and about how they have social and economic impacts. Resolving such problems is central to the formation and implementation of science, technology and innovation policy. The research of the STEP group centres on historical, economic, social and organisational issues relevant for broad fields of innovation policy and economic growth.