Commodities, Natural Resources and Growth: A Survey through the History of Economics

Mauro Boianovsky (Universidade de Brasilia)
boianovs@unb.br

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1. Introduction

The complex relation between the production of primary commodities and economic growth has been discussed from different angles throughout the history of economic thought. One of the main issues, dealt with in the next section, is the apparent contrast between the theoretical advantages of natural resources and the historical record. Section 3 investigates the impact of natural resources booms on the level of activity of other productive sectors of the economy. That is followed by a discussion of the secular trend and cyclical instability of terms of trade between primary and industrial goods. Growth stages and the distinct growth potential of primary and secondary sectors are tackled in section 5. Finally, section 6 surveys the two main approaches to positive links between primary commodities exports and economic growth.
2. Natural resources, labor supply and institutions

The *locus classicus* of the discussion about the relation between natural resource availability and economic growth are sections 2 and 3 of chapter VII (titled “On what depends the degree of productiveness of productive agents”) of the first book of J. S. Mill’s *Principles of Political Economy*. Mill ([1848] 1909), p. 102, started by stating that “the most evident cause of superior productiveness is what are called natural advantages.” Such advantages are the fertility of soil, a favorable climate, abundance of mineral production in suitable location, and convenient maritime situation. The theoretical value of such natural advantages, *ceteris paribus*, is “too obvious to be ever underrated”. The historical record, however, according to Mill, did not confirm the purely theoretical model.

But experience testifies that natural advantages scarcely ever do for a community, no more than fortune and station do for an individual, anything like what it lies in their nature, or in their capacity, to do. Neither now nor in former ages have the nations possessing the best climate and soil been either the richest or the most powerful; but (in so far regards the mass of the people) generally among the poorest, though, in the midst of poverty, probably on the whole the most enjoying (Mill [1848] 1909, p. 104).

The last sentence testifies to Mill’s utilitarianism, in the sense that leisure, not just income, may be a source of utility. Mill’s statement of what is nowadays called the “natural resources curse” thesis (a term coined by Richard Auty 1993; see the survey by Paul Stevens 2003) was based on two different links. The first was the perverse effect of natural resources abundance on effort supply.

Human life in those countries can be supported on so little, that the poor seldom suffer from anxiety, and in climates in which mere existence is a pleasure, the luxury which they prefer is that of repose. Energy, at the call of passion, they posses in abundance, but not that which is manifested in sustained and persevering labor (ibid).

The second factor behind the negative relation between natural wealth and productivity, according to Mill, was the weakened institutional quality of those countries. Similarly to effort supply, the lack of concern with the future path of income affects negatively institutional capacity.

As they seldom concern themselves enough about remote objects to establish good political institutions, the incentives to industry are further weakened by imperfect protection of its fruits (ibid).
Mill (p. 701) claimed elsewhere in his *Principles* that the improvement of the “security of person and property” would call into fuller activity the “productive capabilities” of the economy. Moreover, the “ignorance and misgovernment in which many of the regions most favored by nature are still groveling” meant that it would take many generations until those countries could reach the productivity level of Western Europe (ibid). In particular, the explanation of the poverty of “many fertile tracts of Asia” was the very low degree of security brought about by the appropriation of substantial parts of agricultural output by the government (pp. 12 and 113).

Whereas modern literature stresses institutional channels (see e.g. Isham, Woolcock, Pritchett and Busby 2005; Mehlun, Moene and Torvik 2006) to explain the often negative relation between natural resources and growth, the link through effort supply played an important role in the old literature. Mill’s (p. 104) assumption that “it is difficulties, not facilities, that nourish bodily and mental energy” echoed a similar remark made by the French political philosopher Montesquieu a hundred years before (see also a similar quotation from Jean Bodin [1576] 1967, p. 565, provided by Sachs and Warner, 1999, p. 14).

The barrenness of the earth renders men industrious, sober, inured to hardship, courageous, and fit for war; they are obliged to procure by labor what the earth refuses to bestow spontaneously. The fertility of a country gives ease, effeminacy [“mollesse” in the French original, which may be also translated as “indolence”], and a certain fondness for the preservation of life (Montesquieu [1748] 1914, book 18, chapter IV).

The issue of “indolence” also came up in section 4 (“On the fertility of the soil, considered as the stimulus to the continued increase of wealth”) of chapter I of the second book of Thomas Malthus’s *Principles*. That section was a critical reaction to David Ricardo’s ([1821] 1951, pp. 291-92) proposition - known as “Say’s Law” - that, since “productions are always bought by productions”, there cannot be a glut of every commodity. Hence, “if I had food and necessaries at my disposal, I should not be long in want of workmen who would put me in possession of some objects most useful or desirable to me.” According to Malthus ([1836] 1968, p. 333), Ricardo’s argument would not apply if the worker preferred indolence to further labor, after the necessaries of life were obtained with very little labor. Malthus attempted to establish his case by comparing the proportion of workers employed in the primary sector in “unimproved countries” - that is, regions with low levels of income, capital and population - and in improved ones like England. He claimed that the evidence pointed to the fact that that proportion was higher in relatively underpopulated countries, despite the fact that only rich soils were cultivated. This indicated that
If the facility of production which rich land gives has the effect, under certain circumstances, of preventing the growth of industry and skill, the land may become practically less productive, compared with the number of persons employed upon it, than if it were not distinguished for its richness (Malthus [1836] 1968, p. 335).

In order to illustrate his argument, Malthus examined the economic situation of the Spanish colonies in America, based on the account provided by the famous German geographer Alexander von Humboldt, who traveled to (what are now) Venezuela, Cuba, Colombia, Ecuador, Peru and Mexico in the beginning of the 19th century. Humboldt’s reports were originally published in French and translated in four volumes as his celebrated Political Essays on the Kingdom of New Spain (1811-12). According to Humboldt, the high fertility of the soil was accompanied by reduced labor supply and widespread poverty in the region. This suggested, as interpreted by Malthus (p. 337), that “the extreme fertility of these countries”, instead of encouraging the growth of income and population, “has produced, under the actual circumstances in which they have been placed, a degree of indolence which has kept them poor and thinly populated after the lapse of ages.”

Against Ricardo ([1821] 1951, pp. 99-100) hypothesis that poverty in countries with abundance of fertile land resulted from their reduced pace of capital accumulation - caused in its turn by “bad government, insecurity of property and want of education” - Malthus (p. 344) argued that indolence and deficient wealth of a fertile country were caused mainly by “want of demand [rather] than want of capital.” Low effective demand was explained by insufficient “vent ... for the raw materials in foreign commerce”, and especially by the “extreme inequality of landed property” (p. 340). The key role of effective demand was made evident, as Malthus observed on the basis of Humboldt’s account, by the intense cultivation which took place in the neighborhood of new mines. The actual state of demand for produce in most of the region, and the actual state of “ignorance and indolence”, prevent the potential native tenants from being able to pay to great proprietors a rent equal to what the land would yield in its uncultivated state to support a “few hundreds of cattle” instead of “thousands of people” (pp. 341-42). The slow progress of New Spain, compared with its “prodigious resources”, was then clearly accounted for.

Of that encouragement to the increase of population, which arises from the division and subdivision of land as new families are brought into being, the country is deprived by the original state of property, and the feudal customs and habits which it necessarily tends to generate. And under these circumstances, if a comparative deficiency of commerce and manufactures, which great inequality of property tends rather to perpetuate than to correct, prevents the growth of that demand for labor and produce, which can alone
remedy the discouragement to population occasioned by this inequality, it is obvious that Spanish America may remain for ages thinly peopled and poor, compared with her natural resources (pp. 342-43).

The upshot is that fertility of soil alone is not an adequate stimulus to continuous economic growth (p. 344).

Malthus’s insight about the close association between the institutional features of Latin American society, its degree of inequality and economic underdevelopment may be found under another guise in some modern discussions of the relation between institutions, factor endowments and growth (see e.g. Engerman and Sokoloff 1997). In that regard, Malthus was following the path opened by Adam Smith ([1776] 1976, pp. 572-73), who argued in the Wealth of Nations that the English colonies of North America were not as well provided with plenty of good land as the Spanish and Portuguese ones. Nevertheless, “the political institutions of the English colonies had been more favorable to the improvement and cultivation of this land”, than those of Latin America, which was behind their higher rate of growth. Smith referred specifically to restrictions on the engrossing of uncultivated land and to the moderation of taxes imposed on the English colonies as compared to the Spanish and Portuguese ones.

3. Natural resource booms and structural changes

It was probably as a reaction to Adam Smith that Humboldt (1811-1812, vol. II, p. 405) wrote that “it cannot be doubted that, under improved social institutions, the countries which most abound with mineral production will be as well if not better cultivated than those in which no such productions are to be found”. Humboldt, however, disagreed with the introduction into “works of political economy” of a “simplifying” kind of reasoning “which is perpetuated because it flatters the mental indolence of the multitude.”

The depopulation of Spanish America, the state of neglect in which the most fertile lands are found, and the want of manufacturing industry, are attributed to the metallic wealth, to the abundance of gold and silver; as, according to the same logic, all the evils of Spain are attributed to the discovery of America.

Humboldt claimed that the discovery of precious metals had attracted workers and led to a higher level of agricultural and industrial activities in the neighborhood of mines, and that the source of poverty in Latin American economies should be sought elsewhere.
That passage attracted the attention of the English classical economist John E. Cairnes, who - without challenging Humboldt’s view that the neglect of agriculture in some parts of Spanish America was due in large degree to defects in their social institutions (Cairnes 1873, p. 32) - rejected the notion that “speaking with reference to a country in which occupation has been effected and society established, the possession of mineral treasures is favorable, or can be otherwise than unfavorable, to the cultivation of the soil” (ibid). Under the assumption of full-employment, the theory of comparative advantage states that the possession by a country of any singular advantage in production operates, “in proportion to the extent of the advantage, as a premium against all other industrial pursuits” (ibid). The possession of those exceptional facilities makes it profitable to satisfy the country’s wants by other commodities through international exchange rather than direct domestic production. That was how Cairnes explained Humboldt’s observation about the general underdevelopment of agriculture in the Spanish America, which had also raised Malthus’s interest, as discussed above.

I therefore find it impossible to believe that the mineral resources of the Spanish American States did not exercise in these countries an influence prejudicial to the progress of their agriculture, and that these were among the causes which contributed to that backward state of cultivation which Humboldt notices and describes (pp. 32-33).

The notion that a quick increase in exports earnings (particularly caused by the discovery or increase in the prices of mineral resources) may bring about structural changes in the economy, accompanied by the coexistence of booming and lagging sectors, has been called since the 1970s “Dutch disease”. Although the emphasis of that literature is on medium-term deindustrialization, Cairnes’s discussion of the perverse effects on agricultural production (which we may call “decultivation”) may be considered an early statement of some aspects of Dutch disease phenomena (see also Davis 1995, p. 1768). Cairnes illustrated his argument with a detailed examination of the effects of gold discovery in Australia in mid 19th century, which had led to the unprecedented “spectacle of a country, possessing an immense unoccupied territory, and a soil of more than average fertility, importing more than one-half of its food” (Cairnes, p. 33). The high money-wages brought about by the discovery of gold had made it difficult for Australian employers to compete with foreign suppliers of agricultural and industrial goods.

The extension of agriculture in Australia has thus, though stimulated for the moment, suffered a real check from the gold discoveries; and the same influence has been felt throughout every branch of industry in that country, gold mining excepted ... All in strict conformity with the established principles of economic science (pp. 35-36).
Cairnes (pp. 40-43) stressed that such changes were not accompanied by a reduction in aggregate income. Gold discoveries had apparently enabled Australia to enjoy a higher level of income through its participation in foreign trade according to the principles of comparative advantage.

The effects of a sudden increase of the price of a primary commodity on the price of productive factors were analyzed by the Swedish economist Knut Wicksell ([1916] 1958, pp. 136-37; 1919). Differently from Cairnes, Wicksell adopted a neoclassical perspective, with differences in factor endowments between countries and differences in factor proportions between sectors. An increase in the international price of primary commodities (such as iron ore and wood produced by Sweden) brings about higher demand and price of the abundant factor (land) and a reduced demand and price the scarce factor (labor). Wicksell’s 1919 formulation, written as part of a critical review of a book by Eli Heckscher, would raise the latter’s reaction in the form of the now classic article that provided the foundation of the Heckscher-Ohlin trade model (Heckscher [1919] 1991; see also Flam and Flanders 1991; Herlitz 2002).

Suppose the price of iron ore and lumber rose so high relative to the price of manufactured goods and foodstuffs, that it became profitable for our mine- and landowners to export only iron ore and unfinished or slightly finished wood products, even allowing trees to grow on all fields and pastures. As long as such a tendency is weak, as it is at present, it can still - albeit under the pressure of falling wages! - be offset by more intensive use of the best agricultural land and some still-surviving industries. If it becomes stronger, then, under competitive conditions, the majority of the population must emigrate or decline in number by some other means. For the world economy as a whole this would be highly advantageous; from the point of the world economy nothing is more beneficial than that those parts of the earth best suited to the production of raw materials be devoted to that purpose, even if population is thereby rendered sparse; for the Swedish people, as a nation, it is a different matter (Wicksell 1919, p. 17; translated in Heckscher [1919] 1991, p. 64).

Wicksell’s scenario of the economic situation following a sharp increase in the relative price of the land-intensive commodity may be then described as deindustrialization and decultivation, just like Cairnes. However, differently from Cairnes, the double assumption of factor substitution and differences in factor proportions are behind Wicksell’s derivation of a Stolper-Samuelson effect in a two-good, two-factor model (see Flam and Flanders 1991, n. 10). Aggregate domestic output may fall because excess labor supply eventually brings down real wages even below their subsistence level, with ensuing reduction in population through emigration or a lower rate of demographic growth.
Wicksell’s remarks about the effects of trade on income distribution provided the starting-point for Heckscher’s elaboration of the double proposition that the pattern of trade is determined by dissimilarities in factor endowments and that commodity trade brings about equalization of factor prices. Heckscher ([1919] 1991) agreed that the process described by Wicksell would lower the real wage rate, but rejected the notion that labor could become superfluous and that emigration would be the outcome. Under the assumption that there is no international mobility of the labor factor, real wages before trade should be higher than abroad. Trade would then decrease domestic wages to the world level and Swedish workers would be able to compete with foreign ones. Increased demand for land cannot result in domestic wages falling below the world level, for this would mean that “the originally too scarce labor is now less scarce than in other countries” (p. 59). Heckscher suggested that Wicksell’s case fits better an economy with mobile factors, so that all factor prices are initially at the world level.

There is subsequently an increase in the scarcity of raw materials abroad and with it necessarily higher foreign rent on land and a decrease in the foreign wage rate. Sweden then has lower rents but higher wages than prevail abroad and consequently exports more raw materials and imports more manufactures. This leads eventually to the same changes in factor prices in Sweden and abroad; when this has taken place, exchange no longer increases... Increased demand for a country’s natural resources does not in itself result in labor having a lower price inside the country than outside, and since it does not, there is clearly no reason for it to emigrate (Heckscher [1919] 1991, p. 65).

Hence, Heckscher deployed his new trade model to reject Wicksell’s scenario of deindustrialization, decultivation, unemployment and lower aggregate output following a persistent increase in the demand for natural resources.

The original sense of Dutch disease in the 1970s referred to the fears of deindustrialization in the Netherlands in the wake of the appreciation of the Dutch guilder following the discovery of natural gas deposits in the North Sea in the 1960s. Interestingly enough, an analysis of the Venezuelan economy along the lines of the Dutch disease was provided in the late 1950s by the Brazilian economist Celso Furtado, then head of the development division of CEPAL, the United Nations Economic Commission for Latin America (see also Sid Ahmed 2008; Boianovský 2010). Furtado’s report remained unpublished until recently (Furtado [1957] 2008). Venezuela was regarded as an exception to widespread balance of payments constraint in Latin American economies at the time. Nevertheless, the pace of industrialization and growth of the Venezuelan economy was lower than expected. According to Furtado ([1957] 2008), the oil boom had caused an appreciation of the Venezuelan currency, which implied that the level of money-wages in that country became higher than in economies
with superior labor productivity. In a way reminiscent of the mechanism put forward by Cairnes in the 19th century - but with emphasis on the employment effects, under the assumption that the oil sector is not labor-intensive - Furtado explained how the increase in money-wages (measured in dollars or other foreign currency) had hurt the profitability of other exports and manufacturing, and encouraged imports. During the oil boom,

The absorption of the growing supply of foreign currency was accompanied by a strong appreciation of the [Venezuelan] currency, which resulted in money-wages equal or higher than in those countries where average productivity is much superior to the Venezuelan economy, and which compete in the Venezuelan market with local production... If the free play of market forces were allowed, Venezuela would tend to turn into an economy producing mainly a single good, with a substantial part of its population unemployed or underemployed, and with a currency even more appreciated; the resources from the oil sector would be transferred to consumers... excessive money-wages would make it unfeasible any import-substituting investment... financial resources would tend to emigrate, and the general development of the country would be slow or zero (Furtado [1957] 2008, pp. 54-55; my translation).

Protectionism could be a way out; but, since protection affects the domestic price level, it tends to appreciate the currency and increase relative money-wages even more (p. 55). On the positive side, Furtado (pp. 46-47) pointed to the Venezuelan fiscal system that transferred to the government a significant share of the profit from oil exports, which resulted in increasing public investment in infrastructure in the 1950s.

4. Terms of trade and fluctuations of prices of primary commodities

Oil was regarded by Furtado and other Latin American economists as an exception to the declining trend in the terms of trade between primary commodities exported (mostly) by underdeveloped countries and manufactures exported (mostly) by developed industrialized countries, as claimed by the famous Prebisch-Singer thesis developed by Hans Singer and Raul Prebisch (secretary of CEPAL) around 1950 to explain the income gap between rich and poor countries. By contrast, the Ricardian assumption of diminishing marginal returns to the production of primary commodities had led classical economists (see e.g. Mill [1848] 1909, pp. 702-703) to state that the British terms of trade tended to deteriorate - a proposition well corroborated by the statistical experience of the first half of the 19th century in Britain (Singer 1987, p. 626). It should be noted, however, that such a proposition did not imply convergence of
income levels between industrialized and agricultural/mineral countries. In Ricardo’s ([1821]
1951, ch. VII) original model of comparative advantage neither country is an exporter of means
of subsistence, so that both traded goods are produced under conditions of constant returns. As
pointed out by Darity and Davis (2005, p. 149), if the “South” exports “corn” to the “North”,
divergent growth will take place. The import of corn by the North reduces its cost of labor,
which is accompanied in Ricardo’s system by an increase of the rate of profit and acceleration of
capital accumulation, as the movement to the stationary state is temporarily arrested. On the
other hand, the export of corn in the South has opposite effects, because of the expansion of
production into less fertile land. This process goes on until the marginal cost of production of
corn in the South and in the North are the same. Both countries will then be on their path to their
respective stationary states, which will probably feature a higher per capita income in the North.

The notion that countries should attempt to maximize their exports of manufactured
goods and their imports of primary commodities was an important element of the mercantilist
doctrine in the 18th century. Richard Cantillon and James Steuart developed the “export of
work” argument, that is, the view that the primary purpose of trade was the import of a surplus of
“matter” (landed) products and the export of a surplus of work in the form of labor-embodying

goods (see Spengler 1960, pp. 39-40). The country gains in exchange if the value of the matter
imported exceeds that of the matter exported, and it loses if the labor included into the product
imported is greater than that incorporated into the product exported. Imported primary
commodities help to support workers and to provide stuff for manufacturing, so that a part of the
population is maintained at the expense of the landed products of foreign countries. Moreover,
the argument has a bellicose aspect, since one country is supposed to leave off the primary
products of others, therefore preventing economic growth of any country specialized in those
commodities. It is worth noting that the “export of work” doctrine can be found, under another
guise, in Adam Smith’s criticism of the physiocratic thesis that the income of an agricultural
country is greater than that of an industrial and trading one, even granting the assumption that net
income consists of the amount of agricultural goods produced. Inspired by the experience of
Holland at the time, Smith stated that

A small quantity of manufactured produce purchases a great quantity of rude produce. A
trading and manufacturing country, therefore, naturally purchases with a small part of its
manufactured produce a great part of the rude produce of other countries; while... a
country without trade and manufacture is generally obliged to purchase, at the expense of
a great part of its rude produce, a very small part of the manufactured produce of other
countries. The one exports what can subsist and accommodate but a very few, and
imports the subsistence and accommodation of a great number. The other exports the
accommodation and subsistence of a great number, and imports that of a very few only.
The inhabitants of the one must always enjoy a much greater quantity of subsistence than what their own lands ... could afford. The inhabitants of the other must always enjoy a much smaller quantity (Smith [1776] 1976, pp. 677-78).

Smith’s (and the mercantilist’s) argument in favor of the exports of industrial goods and imports of primary commodities was, therefore, based on the interpretation of the level of the terms of trade, not on the behavior of its trend over time.

In the late 1940s Singer prepared for the United Nations a time series of the British terms of trade between 1873 and 1938, which indicated a falling trend against primary commodities imported by Britain. Singer’s study came out anonymously in 1949 (United Nations 1949), and formed the empirical basis of the Prebisch-Singer hypothesis (see Toye and Toye 2003). Singer’s explanation of secular decline was developed in a paper presented at the December 1949 meetings of the American Economic Association (Singer 1950a) and in a series of lectures delivered in Rio de Janeiro in July 1950 (Singer 1950b). He challenged the “established” classical view that - assuming trade to be beneficial for both countries specialized in industrial or raw materials production - it does not matter if rates of productivity change in different degrees, since each country participates in the productivity improvement of its import, which makes an agricultural/mineral country an indirect producer of manufactured goods (1950b, pp. 11-12). In the same vein, Prebisch (1949, p. 47) accepted the theoretical validity of the classical theory of comparative advantages and international division of labor, but pointed out that it was based on a premise - that the fruits of technical progress are shared equally across the international economy through falling prices or rising factor incomes - that had been rejected by facts.

According to Singer, the secular decline of the terms of trade indicated an asymmetric process whereby the gains from technical progress in manufacturing are distributed to producers in the form of higher incomes, while the relatively smaller gains from technical progress in the production of primary commodities are distributed to consumers through lower prices (1950a, pp. 478-9). Such an asymmetry would be largely irrelevant in a closed economy, where consumers and producers are the same body of people, but the situation is different in an open economy. Singer explained the trend towards deteriorating terms of trade by postulating (i) that price elasticities of demand are lower for primary commodities than for industrial goods, due to the small share of raw material as inputs in the value of industrial output and to the fact that food is a basic need; and (ii) that demand for food and raw materials is bound to expand less than demand for manufactured goods, which he ascribed to the low income elasticity of demand for agricultural commodities (Engel’s Law) and to the development of synthetic substitutes for raw materials. The upshot was that
The industrialized countries have had the best of both worlds, both as consumers of primary commodities and as producers of manufactured articles, whereas the underdeveloped countries had the worst of both worlds, as consumers of manufactures and as producers of raw materials. This perhaps is the legitimate germ of truth in the charge that foreign investment of the traditional type formed part of a system of “economic imperialism” and of “exploitation” (Singer 1950a, pp. 479-80).

Singer (1950b, pp. 114-15) was critical of the traditional Marxian thesis that trade between underdeveloped and industrialized countries was dominated by exploitation by capitalists from the latter countries. The same mechanism that accounts for the exploitation of workers and income inequality in industrialized economies would also explain exploitation and income differences between developed and underdeveloped countries. Singer pointed out that the Marxian approach was incompatible with the economic growth of former colonies such as the United States, Canada and Australia. Moreover, the Marxian perspective implied that capitalists should transfer their industrial plants to underdeveloped countries, where workers can be more easily exploited, which, up to the 1950s, has not happened either. Singer (ibid) rejected also two other explanations of the gap between rich and poor countries: the classical view that income differences resulted from the fact that, for several reasons, underdeveloped countries did not engage in international trade to the full extent of their potential, and the notion that non-economic institutional factors prevented underdeveloped countries from taking advantage of their resources.

Prebisch’s (1949) original explanation of the secular decline of relative prices of primary commodities was part of his interpretation of the implications of business cycles in the international economy. The increase of relative prices of primary commodities in the boom was more than compensated by their sharp fall in the slump, due to the structure of both commodity and labor markets in industrial and underdeveloped countries. In contrast with the “well-known resistance to a lowering of wages in the center”, the characteristic lack of organization of workers employed in primary production in the periphery “prevents them from obtaining wage increases comparable to those of the industrial countries, and from maintaining the increases to the same extent” (Prebisch 1949, p. 59). Structural unemployment in the rural sector resulted from the character of technical change in agriculture and from the low rate of growth of demand for primary commodities from the developed countries of the “center”. Reacting to Jacob Viner’s (1953) view that peripheral countries should accelerate their rate of development by increasing productivity in their primary activities and expanding exports, Prebisch wrote that

Technical progress in export activities of these peripheral countries has undoubtedly been a great stimulus to their growth. But if this process is extended to other primary activities
for internal consumption, where productivity is usually very low, and industry is not
developed to absorb redundant manpower, then the inevitable outcome will be more
disguised unemployment, or downright unemployment. Thus the plea for technical
advance in primary production as an alternative to industrialization in order to improve
standards of living defeats its own purpose, as some of the fruits of such technical
advance will usually be transferred from the peripheral countries to the outer world,
unless it is buttressed by a vigorous process of industrialization... The greater the
inelasticity of demand for peripheral exports, the larger the proportion of the fruits that is
so transferred (Prebisch 1959, p. 252).

Prebisch (1959, p. 263) mentioned the possibility that “compensatory forces” could offset
the tendency of the terms of trade in the periphery to deteriorate. One of these forces was
Ricardian diminishing returns, to the extent that growing demand for some products prompts a
resort to agricultural or mining land with lower returns. However, the historical record indicated
that such forces had not been strong enough. Prebisch, therefore, supported protectionist policy
in order to encourage import-substituting industrialization. Nevertheless, his position could not
be described as “autarkist”, as his analysis of the “limits to industrialization” (1949, p. 81) makes
clear. The industrialization process should not necessarily entail a reduction of exports by
transferring labor from the primary to the secondary sector, since it could cause a real income
loss. The limit is given by a comparison between the marginal increase of industrial production
and the amount of goods obtained in exchange for exports. Moreover, ceteris paribus, “the
greater are Latin American exports, the more intense can be its pace of economic development”
(p. 82), especially because of imports of technologically sophisticated capital goods.

The combination of low price elasticities of demand and supply has consequences not
just to the terms of trade trend, but also to cyclical instability of primary commodities, as both
Singer and Prebisch were aware. In fact, the mechanism had been already investigated by J. M.
Keynes in a memorandum written in 1942 but published only in 1974. Keynes ([1942] 1974,
appendix I) provided evidence of the wide fluctuations in the prices of raw materials provoked
by oscillations in demand (the business cycle) and supply. His main concern was to design a
buffer-stocks scheme in order to stabilize commodity prices, run by an international body called
“Commod Control”. The scheme aimed not only at reducing produce risk and smoothing the
business cycle, but also stabilizing producer incomes (see Dimand and Dimand 1990).

At present a falling off in effective demand in the industrial consuming centers causes a
price collapse which means a corresponding break in the level of incomes and of
effective demand in the raw material producing centers, with a further adverse reaction,
by repercussion, on effective demand in the industrial centers; and so on, in the familiar
way, the slump proceeds from bad to worse. And when the recovery comes, the rebound to excessive demand through the stimulus of inflated prices promotes, in the same evil manner, the excess of the boom. But if the Commodity Controls are in a position to take up at stable prices the slack caused by the initial falling off in consuming demand and thus to preserve some measure of stability of incomes in the producing centers, the vicious cycle may be inhibited at the start; and, again, by releasing stocks when consumption recovers, the Commodity Controls can prevent the inflation of raw material prices which carries the seeds of an incipient boom (Keynes [1942] 1974, pp. 305-06).

As it happened, Keynes lost the political battle to create the Commodity Control as a third postwar world institution, along with the International Monetary Fund and the World Bank which he also had successfully devised.

5. Growth stages

Singer’s (1950a, p. 476) case for industrialization in underdeveloped countries was based not only on the falling terms of trade thesis, but also on the dynamic importance of industrialization per se. To a much larger extent than the primary sector, manufacturing, argued Singer, affects positively the general level of education, creation of new demand and technological progress - apart from the Marshallian internal and external economies effects on other industries. From that perspective, a country well endowed with natural resources, which is led by comparative advantages to export primary products and import manufactures, will have its rate of growth reduced by trade (see Matsuyama 1992 for a formalization of this kind of argument), which accords with the “dependency” literature developed in the 1960s and 1970s.

The view that industry offers larger scope for productivity growth than the primary sector goes back to Smith’s ([1776] 1976, p. 16) proposition that the degree of division of labor is more intense in industry than in agriculture, which led to his observation that “the most opulent nations generally excel all their neighbors in agriculture as well as in manufactures; but they are commonly more distinguished by their superiority in the latter than in the former.” This remark was applied largely to manufacturing economies. Elsewhere, Smith put forward an optimum investment pattern behind the stages every nation should follow in order to maximize its rate of growth through time. The criterion was the amount of labor “put in motion” by a unit of capital, that is, the net value, measured in wage units, added by equal quantities of capital in equal periods of time (the reciprocal of the capital-labor ratio; see Blaug 1985, p. 56). Agriculture came first in the “hierarchy of productivity of industries” - since the value of the product of
agriculture is sufficient to pay rent as well as wages and profit - followed by manufacture, inland trade, foreign trade and carrying trade.

According to the natural course of things, therefore, the greater part of the capital of every growing society is, first, directed to agriculture, afterwards to manufacture, and last of all to foreign commerce (Smith [1776] 1976, p. 380).

It has been the principal cause of the rapid progress of our American colonies towards wealth and greatness, that almost their whole capitals have hitherto been employed in agriculture (p. 366).

That was not the case in Spanish America though, where mining absorbed a significant share of investment. Because of the uncertainty characteristic of mining activity (described as a “disadvantageous lottery”), it often involved destruction of capital. That is why Smith (p. 562) claimed that “projects of mining, instead of replacing the capital employed in them, together with the ordinary profits of stock, commonly absorb both capital and profit” (quoted also by Wright and Czelusta 2007, p. 183). In terms of the optimum investment pattern argument, that means that mining should be the “least chuse” activity to be encouraged by government.

The interpretation of the economic growth process as a succession of stages, adumbrated by Smith, was first elaborated by the German-American economist Friedrich List in his 1841 National System of Political Economy (see Hoselitz 1960). List, however, one of the founders of the German Historical School of economics, drew policy conclusions that differed from Smith’s. List’s model of growth stages was built on his concept of “productive forces” or “productive power” (Produktionskräfte) as encompassing cultural and political institutions, which he contrasted with the classical notion of exchange values based on labor. Just like in the mercantilist literature, the relevant unit of analysis was the nation, not the world economy. List wrote in the introduction (included in the American 1856 translation, but not in the better-known 1885 British one) that

The productive power of nations is not solely dependent on the labor, the thrift, the morality, and the intelligence of individuals, or on the possession of natural advantages and material capital; it is dependent also upon institutions and laws... but above all upon the security of their duration, independence and power as nations ([1841] 1856, p. 74).

Whereas classical economists stressed the production of exchange values by agricultural and industrial workers, List argued that scientists, artists, judges, educators etc are productive in a higher degree, since they produce productive powers ([1841] 1885, p. 116). “Although laws and public institutions do not produce immediate values, they nevertheless produce productive power” ([1841] 1885 p. 117). Economic growth is the result of technical progress, new
institutions, education and “capabilities of production”, which differ in agricultural and industrial economies. Productive powers are only fully developed in industrial nations, which are not beset by “dullness of mind”, traditional habits and methods, lack of incentives to the application of science to production etc that prevail in agricultural societies (pp. 120, 159, 163). Consequently, in purely agricultural economies a large portion of the existing natural resources (including minerals) lies idle, until the establishment of manufacturing leads to the development of demand for raw materials and means of transportation (chapter 18). List distinguished four stages in the growth process of open economies: (i) agriculture is encouraged by import of manufactures and exports of primary commodities; (ii) manufactures start to be produced at home; (iii) manufactures mainly supply the domestic market; and (iv) exports of manufactures on a large scale and imports of primary commodities ([1841] 1856, p. 77). Trade may play a positive role in the early stages of development of an agricultural nation which still possesses large areas of uncultivated land and produces staple commodities easy to transport that are demanded by manufacturing nations. However, the “fickleness of foreign demand” - caused by wars, tariff regulations, oscillation of crops etc - poses a serious problem for agricultural economies, whose private and public levels of expenditure are usually adjusted to previous periods of peak of exports.

Agricultural prosperity would under these circumstances act like the stimulant of opium or strong drink, stimulating merely for a moment, but weakening for a whole lifetime... A period of temporary and passing prosperity in agriculture is a far greater misfortune than uniform and lasting poverty. If prosperity is to bring real benefit to individuals and nations, it must be continuous... And only by the possession of manufacturing power of their own, van well-developed nations posses any guarantee for the steady and permanent increase... (List [1841] 1885, p. 198).

Agricultural nations which have achieved some level of development of their productive powers are only able to embark upon an industrialization process and compete successfully with mature manufacturing economies if protectionist legislation is adopted, which List (chapters 26-27) elaborated as part of his well-known “infant industry” argument. List has, therefore, become the patron saint of protectionism in Latin American and developing countries. However, he applied the infant industry argument to countries of the temperate zone only, for “the moderate temperature of the air promotes the development and exertion of [physical and intellectual] power far more than hot temperature” (p. 172). That was List’s explanation for the observed fact that manufacturing countries belonged as a rule to the temperate zones. Countries of the “torrid zone” possess the natural monopoly of many “precious commodities” which form most of the imports of the manufacturing nations - interestingly enough, List (p. 211) mentioned several
agricultural commodities but no mineral products, presumably because of the high transportation costs that still prevailed in mid 19th century. Increasingly free trade between industrialized countries and the tropics based on “natural causes” should entail - especially if accompanied by the “perfection of means of transportation by water and by land” - a process of international cumulative growth in the future. List (pp. 216-17) anticipated that Asian tropical countries would, just like India, pass gradually under the economic domination of manufacturing nations of the temperate zone, and that “the States of South America will always remain dependent to a certain degree” of imports of industrial goods. Hence, despite his general criticism of the theoretical and policy approaches of Smith and Ricardo, List subscribed to the classical international division of labor, as long as England shared her industrial (and political) power with other temperate countries like Germany and the United States.

A country of the torrid zone would make a fatal mistake should it try to become a manufacturing country. Having received no invitation to that vocation from nature, it will progress more rapidly in riches and civilization if it continues to exchange its agricultural productions for the manufactured products of the temperate zones. It is true that tropical countries sink thus into dependence upon those of the temperate zones, but that dependence will not be without compensation if competition arises among the nations of temperate climes in their manufacturing industry, trade and exercise of political power ([1841] 1856, pp. 75-76).

The political power of industrial nations was largely based on the “methods of warfare”, which depended on technological progress associated with manufacturing ([1841] 1885, pp. 168-69). Interestingly enough, as the process of industrialization of Germany intensified around the turn of the 20th century, some economists of the young Historical School such as Richard Pohle and Adolf Wagner expressed concern with the other side of the coin, ie the military dangers of the growing dependence upon other countries for raw materials and foodstuffs (see Haberler [1933] 1936, pp. 285-86). Their suggestion to protect the German primary sector from foreign competition would be regarded as an anathema by List. Similarly, W. S. Jevons’s (1865) analysis of the British Coal Question reflected the importance the English economist attached to the “economy of power” and hence to natural resources whence power was derived. The source of power and of British “peculiar industrial supremacy” had been, according to Jevons, its domestic supply of coal, which was apparently becoming increasingly limited (see Spengler 1972). From a more general perspective, Schumpeter’s ([1911] 1934, p. 66) definition of development as the “carrying out of new combinations” included not just the introduction of new methods of production and new goods, but also resource-based development through “the conquest of a new source of supply of raw materials or half-manufactured goods, irrespective of whether this source
already exists or whether it has first to be created”, which would link up with his later writings on imperialism.

List’s framework of growth as a succession of stages from agriculture to industry has left its mark on Rostow’s 1960 *Stages of Economic Growth*. Rostow distinguished the take-off that resulted from the transformation of traditional societies into dynamic ones (such as in Britain) from the take-off that took place in resource-abundant new economies such as the United States and Canada in the 18th and early 19th centuries. In the latter case, “take-off was delayed not by political, social and cultural obstacles but by the high (and even expanding) levels of welfare that could be achieved by exploiting land and natural resources... The attractions of ample fertile land and trade based on the possession of rich natural resources were too great to draw sufficient energy, talent, and resources into industry” (Rostow 1960, pp. 34 and 36). Natural resource abundance presented, therefore, in some societies an obstacle on the way to industrialization according to Rostow’s approach.

6. Vent-for-surplus and staple theories of trade and growth

In contrast with Rostow’s interpretation of the economic development process of North America, Canadian economic historian Harold Innis ([1930] 1956] advanced the thesis that export of staple commodities played a key role in creating the conditions that started the industrialization of Canada. Innis’s approach to the general impact on the economy and society of staple production was further elaborated and applied to American economic history by Douglass North (1961). The focus of the staple approach is the potential spread effects of the natural resource-based export sector on domestic economy, which grows through diversification of the export basis (see Watkins 1963). Its main hypothesis is that the growth experience of a “new” country is historically shaped by the specific characteristics of the primary commodities which that country exports to the industrial centers. Such characteristics may be described in terms of the backward and forward linkage effects concept introduced by Hirschman (1958). If the linkage effects are weak, the economy may get caught in a “staple trap” in which, instead of diversifying its activities, it remains dependent on a narrow export base and features a declining rate of economic growth. In that case, the increment to income of the expansion of the export sector leads to an increase in the supply of that staple, with little effect on broadening the export base or extending the size of the domestic market.

The notion of a staple trap is associated with the dependency school’s “development-of-underdevelopment” thesis that staple booms have often resulted in depressed areas with depleted mines, exhausted soil and impoverished subsistence agriculture (Frank 1966; Lewis 1989, pp.
This applies *inter alia* to staples produced in enclave conditions - often by foreign owned companies which send profits back home - with a large differential in productivity between the export and domestic sectors indicating that the former have not become an integrated part of the economy (see Singer 1950a, p. 475, for a first formulation of this argument). The disposition of the income received from the export sector plays a key role in the process. The plantation type of export commodity - as well as mining activity - has been contrasted with family-size farm type: unequal distribution in the first case leads to weak linkage effects, since income will be spent in foodstuffs and simple necessities by the bulk of the population and on imports of luxury goods by the others, with little impact on domestic investment demand. Such divergent patterns are also relevant for investment in knowledge, as pointed out by North (1961, pp. 4-5):

> Under the plantation system, with its marked inequality of incomes, the planter will be reluctant to devote his tax monies to expenditure for education or research other than that related to the staple commodity. In contrast, the region with more equitable income distribution will be aware of the stake in improving its comparative position through education and research, and be willing to devote public expenditures in these directions. This will improve its relative position in a variety of types of economic activity and broaden the resultant economic base.

Some aspects of the staples approach to growth have been applied independently by Celso Furtado to the American and Latin American economies. In his comments to a paper by Rosenstein-Rodan - presented to the 1957 International Economic Association conference on economic development held in Rio - Furtado (1961, pp. 70-71) contrasted the historical experiences of mining in Bolivia and coffee production in Brazil in order to account for the better economic performance of the Brazilian economy throughout the first half of the 20th century. Despite large (mostly foreign) investment in mining and overhead capital, which resulted in a substantial increase of exports, the Bolivian economy had remained stationary. The system of appropriation and utilization of the country’s surplus (in the classical Ricardian sense) was not changed by investment in mining, since the structure of internal demand remained the same. This was explained by the double fact that mining employed only a tiny fraction of the country’s labor force, and the profits it generated were almost entirely transferred abroad. Consequently, the impact of investment on the composition of domestic demand was slight and could be absorbed by the increase in imports. The same amount of investment in a labor-intensive commodity such as coffee would have different effects, as shown by the Brazilian economic growth process. The large increase in aggregate volume of real wages, accompanied
by the investment of coffee profits in domestic economic activities, caused significant changes in the structure of demand, which started the first round of the industrialization process.

If external demand absorbs increasing quantities of coffee over a prolonged period, a very substantial change may take place in the structure of demand. In so far as internal supply keeps pace with these changes, possession of the surplus will inevitably be transferred from the traditional landowner class to the commercial and industrial entrepreneurial class. As first generation entrepreneurial classes have a high propensity to save, the concentration of part of the surplus in their hands will be conductive to a considerable increase in reproductive investment. The underlying process of social change takes place under the stimulus of exogenous factors, namely, the creation of a flow of exports or an inflow of resources from abroad (Furtado, 1961, p. 71).

The reasons why the Brazilian economy, despite the impulse provided by coffee exports and the further acceleration of industrialization through import substituting, had failed to come any near the American income level should be sought in their different patterns of development in the first half of the 19th century, when their respective rates of growth started to diverge (Furtado [1959] 1963, ch. 18). “Putting aside the superstitious fatalism implicit in the theories of inferiority of climate and race which have for sometime prevailed” (p. 108), Furtado found the relevant economic explanation in the growth of cotton exports at the time - a crucial raw material at the beginning of the industrial revolution - cultivated in the south of the United States, which transformed the economic structure of other areas of the country (see also North 1961 ch. 7 for a similar interpretation of American economic growth). On the other hand, the Brazilian economy - suffering from a stagnating period that lasted from the end of the 18th century gold mining cycle to the beginning of coffee expansion by late 19th century - lacked an important export staple that could support its growth process.

One of the main links in Furtado’s interpretation of the role of commodity exports in economic development is the notion that the the opening of foreign trade “will allow the economy to make a fuller and more rational use of those factors which are available to it in relative abundance, ie land and labor” that are in excess supply and have low or zero opportunity costs. The ensuing increase in productivity provides the starting-point for the process of capital accumulation and growth (Furtado [1952] 1954, p. 131; see also Boianovsky 2010). The view that international trade would provide a major force for economic development in traditional economies with a substantial reserve of unoccupied (“surplus”) resources has been called by Hla Myint (1958) “vent-for-surplus” theory, which he traced back to Adam Smith’s ([1776] 1976, pp. 446-47) remark that trade between countries “carries out that surplus part of the produce of their land and labor for which there is no demand among them, and brings back in return for it
something else for which there is demand.” Differently from Ricardian comparative advantages, the function of trade here is not so much to reallocate the given resources as to provide effective demand for the output of the surplus resources which would remain unused otherwise. It may bring about not only “direct gains” from trade in the form of cheaper imports, but also “indirect gains” by transforming the organization of the domestic economy through capital accumulation (as stressed by Furtado), monetization of the traditional agricultural sector and better provision of public services financed by taxes from exports.

As claimed by Myint, the Smithian vent-for-surplus approach is able to account for the rapid expansion of primary exports that took place when underdeveloped countries were opened up to multinational trade from the second half of the 19th century to the first three decades of the 20th century. That is the period when, according to Dennis Robertson’s (1938, p. 5) well-known phrase, trade worked as an “engine of growth”. Growth at the periphery - albeit not of a predominantly industrial kind - was induced, through trade, by growth in the rising industrial center, particularly Great Britain. Robertson was probably influenced by his Cambridge Professor Alfred Marshall’s ([1890] 1990, p. 225) suggestion that “the causes which determine the economic progress of nations belong to the study of international trade”. According to Marshall (p. 556), the field of employment which any country offers for labor and capital depends on its natural resources, progress of knowledge and access to markets in which it can sell those commodities of which it has in superfluity. The last factor stands out prominently in the record of the “new countries”.

Even now there are, especially in South America and Africa, many places to which nature has been abundantly generous, which are nevertheless shunned by labor and capital, because they have no ready communications with the rest of the world. On the other hand high rewards may be offered to capital and labor by a mining district in the midst of an alkaline desert, when once communications have been opened up with the rest of the world... though, if limited to their own resources, they could support but a scanty population, and that in abject poverty. And the splendid markets which the old world has offered to the products of the new, since the growth of steam communication have rendered North America, Australia and parts of Africa and South America, the richest large fields for the employment of capital and labor that we have ever seen (Marshall [1890] 1990, p. 556).

Marshall’s enthusiastic description corresponds to what Prebisch (1949, p. 52) would later call outward growth (“desarrollo hacia afuera”), when exporters of primary commodities - particularly Argentina, where Prebisch was born - experienced a period of significant growth determined by international trade. The question, however, according to Prebisch, Ragnar Nurkse,
Singer, Furtado and other development economists of the 1950s was whether trade would resume that old pattern of growth in mid 20th century or underdeveloped countries should instead embark upon a process of “desarrollo hacia adentro” (inward growth) decided instead by industrial production for the domestic market, as they tended to believe.

7. Concluding remarks

The historical survey of the relation between primary commodities, natural resources and economic growth indicates that, although natural resources abundance may be seen as an advantage in principle, at closer theoretical and empirical inspection the connection with economic development is uncertain at best. With the exception of the controversial Prebisch-Singer hypothesis, the literature surveyed above was not empirically based, although reference was often made to concrete experience or the historical record, as illustrated by Malthus’s use of Humboldt’s reports about Spanish America. Apparently, the first comprehensive statistical investigation of the relation between resources and growth was carried out by Hollis Chenery (1964), who concluded that natural resources abundance had great significance as source of growth and foreign investment in low-income countries, but it became progressively less important as determinant of the level of income as the economy developed. Chenery’s study suggested that the relation is not strong, except if historical and cultural factors are allowed for. More recently, Sachs and Warner (2001) have found empirical evidence of an inverse relation between natural resources wealth and the rate of growth, but their results have been challenged for overlooking the role of the quality of institutions (Mehlun, Moene and Torvik 2006).

The notion that the connection between natural resources and economic development depends on the institutional framework - together with the insight that institutions themselves are to some extent product of the natural environment - may be found in authors such as Malthus, Stuart Mill and List, as documented above. Malthus argued that the distribution pattern of the society affects the way its natural resources are (mis)used. Both Mill and List claimed, from distinct perspectives, that natural resource abundance may affect institutional quality negatively. The effect of resource booms on the economic structure was investigated, as part of the theory of international trade, by Cairnes, Wicksell and Furtado, with the conclusion that “deindustrialization” is a likely outcome. List shared the mercantilists’ view that successful countries should export manufactures and import raw materials, but at the same time concurred with the classical Ricardian thesis about the mutual benefits of the international division of labor between industrial and agricultural/mineral countries. List also mentioned (what we now call) the volatility of primary commodities prices, but stabilization schemes would be devised only much
later by J.M. Keynes. Both Viner (1953) and Haberler (1961) agreed on the evidence about price instability, but disputed the theoretical and empirical foundations of the Prebisch-Singer hypothesis, and reaffirmed the validity of the classical theory of advantage comparative as an adequate explanation of the presumably balanced division of the fruits of technical progress in the world economy. Around that same period, Myint called attention to Smith’s old idea that trade and growth are connected through the “vent-for-surplus” mechanism, which was deployed by Myint, Furtado and others to explain economic growth and trade expansion in underdeveloped countries during the period of free trade that covered a large part of the 19th century and most of the early 20th century. Another approach to the potential positive nexus between primary commodity exports and growth has been provided by the staple theory, which deals not so much with the direct effects of exports expansion as its indirect effects on export diversification and industrialization.

References


