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"BORN WITH A COPPER SPOON: GLOBAL COPPER AND LOCAL DEVELOPMENT, 1870-2000"

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The Commodity Medium

The production, exchange and consumption of commodities sits at the heart of economic life. Since David Ricardo, it is commonly understood that every commodity combines a certain use-value and exchange-value (Schwartz 1977). The necessary connection between the two was perhaps best formulated by Karl Marx: "In order to become a commodity, the product must be transferred to the other person, for whom it serves as a use-value, through the medium of exchange" (Marx 1990:131). As is clear from this quote, production, exchange and consumption are all crystallized within the commodity and it is inexpedient to reduce the commodity and its value to any of these three factors.² On the contrary, the very fact that a commodity embodies all these fundamental economic processes makes it a privileged medium to study the economy, past and present. And as Marx knew, it is also a

¹ This is a rather preliminary first draft. Please do not quote but please do comment in order to further develop the arguments tentatively put forward here. The research this paper introduces has greatly benefited from the postgraduate training at the Belgian/Dutch N.W. Posthumus Institute, a member of ESTER, the European graduate School for Training in Economic and Social Historical Research. Preliminary findings were presented during the "Second Annual Workshop of the Commodities of Empire project (London, 11-12 September 2008) and the "Workshop History of Commodities and Commodity Chains" (Konstanz, 26-28 February 2009). Present research is funded by the European Science Foundation through the GLOBALEURONET initiative. The usual disclaimer applies.

² Classical economists did try to un-bake the cake through their adherence to the labor-theory of value. Ever since Smith proclaimed that labor is the "real measure of the exchangeable value of all commodities", a confusing quest for the objective price of commodities took off (Smith 1986:133). As Roncaglia (2001) discusses, the marginalist revolution by the end of the nineteenth century in turn would stress the subjective nature of commodity prices, reducing the market value of a commodity to its use-value or its utility to the consumer. In doing so, the marginalist approach also failed to appreciate the triple economic forces (production, exchange, consumption) that make commodities.

privileged medium to study capitalism. Commodities sit at the center of the formula for capitalist accumulation, which is to buy in order to sell dearer (M-C-M'). Here too it must be stressed that this capitalist principle is more than a rule of exchange. Having the commodity at the center of the formula, capitalism is dependent on the many different and evolving ways in which commodities are produced, exchanged and consumed and how profits are generated within the process. As Marx knew, and Fernand Braudel demonstrated, this formula is what typifies capitalist accumulation prior to and after the eighteenth century industrialization (Braudel 1982:62-64).

Furthermore, a focus on the expanding markets and production/consumption/investor networks of particular commodities helps to come to a better understanding of globalization, or the geographical extensive and intensive expansion of markets (Held et al. 1999).³ This helps to flesh out a concept which, according to Justin Rosenberg, is too often considered to be an *explanans*, a driving but an opaque force in society that creates specific converging or diverging trends (Rosenberg 2002, 2005, 2007). Global historians like Anthony Hopkins and Bruce Mazlish, world-systems analysts such as Immanuel Wallerstein and African historians like Frederick Cooper have all expressed the need to regard globalization as an *explanandum*, something we need to explain and assess first before determining its effects (Cooper 2001:189; Hopkins 2002; Mazlish 1998; Wallerstein 2004). Commodities often have important stories to tell in this respect. Early on in world history, luxury items, weaponry, even staple goods fueled extensive trade networks across the Andes Mountains, Sahara desert, Mediterranean Sea or Indian Ocean. And as Flynn and Giraldez have put it, sixteenth century global trade was “born with a silver spoon” (Flynn & Giraldez, 1995:201):

[G]lobal trade emerged when all important populated continents began to exchange products continuously — both with each other directly and indirectly via other continents — and in values sufficient to generate crucial impacts on all the trading partners. [...] The singular product most responsible for the birth of world trade was silver.

In short, the place of commodities in the story of capitalism, trade and economic life in general is quite clear. This paper wants to focus on another question: do commodities also allow for a better judgment on how the *global* affects the *local*, or how market expansion is linked to regional economic specialization and economic development? There is much debate for example whether global trade from the sixteenth century onwards did in fact generate the “crucial impacts on all the trading partners” that Flynn and Giraldez ascribe to it. Much of course depends on what is considered to be of crucial impact in this respect. The

³ The connection between market and political expansion, shifting commodity frontiers and integrating production networks is for example a central point of study within the ongoing *Commodities of Empire* project, a joint research collaboration between the Open University's Ferguson Centre for African and Asian Studies and London Metropolitan University's Caribbean Studies Centre (for more information see Hazareesingh & Curry-Machado 2009).

Columbian Exchange between Europe and the Americas in animals, foods, human populations, diseases and ideas is well accounted for (Crosby 1972). On the production side, global trade also pushed forward the commodity frontiers for sugar, slaves and silver (Moore 2000). And Britain's success in this global trade, among other reasons, buttressed a British high-wage economy in which it paid to push for labor-saving, capital intensive industrialization. As Robert Allen notes, the Industrial Revolution – not a minor event – can be seen as the sequel to this early phase of globalization; a phase that Anthony Hopkins and Adam McKeown call “proto or early” globalization (Allen 2009; Hopkins 2002; McKeown 2007).

Global commodity trade thus undeniably impacted local developments before 1800. Whether these impacts are deemed crucial or not to a large extent lies in the eye of the beholder. Still, the industrial revolution closes a period of “proto-globalization” and ushers in a more intense phase of globalization for the very reason that the potential impact of global trade on local developments would attain much higher levels after industrialization. As O'Rourke and Williamson portray it, the nineteenth century saw the coming of a new era of commodity exchange and specialization with “the rise of trade in basic competing goods such as wheat and textiles, preceded by an eighteenth century transitional phase sprinkled with trade in furs, tobacco and cotton” (O'Rourke & Williamson 2002:26-27; Jacks 2005). The general mechanization of industry and the subsequent transport revolution of the railroad and steam-powered iron ships reduced the costs of transacting, transporting and trading commodities, both within and across national and imperial frontiers, redefining the limits to productivity, globalization and stimulating an international division of labor.⁴

Findlay and O'Rourke therefore consider the period between 1780 and 1914 to be the era of *The Great Specialization*, with long-distance trade triggering unprecedented economy-wide effects on the allocation of resources, factor prices and the distribution of income (Findlay & O'Rourke 2007:382-387). As O'Brien summarizes it from a European perspective, by last quarter of the 19th century, some 70% of the commodities traded on international markets by core regions of the global economy such as Britain, Belgium Holland, France, Germany or Switzerland consisted of manufactures, while the primary produce imported by these countries accounted for approximately the same percentage of its imports (O'Brien 2004:16-17). The reality of the effects of this specialization is illustrated by the *intra*-national conflicts between those groups in society who gained or lost as a result of intercontinental trade. On the *inter*-national level, *Great Specialization* was matched by a *Great Divergence*. Especially

⁴ It must be stressed that imperialism is not a synonym for globalization (nor its atonym for that matter). The technological evolutions in communications, transport and military power that allowed for the acquisition and effective control of outside regions had broader implications, reducing overall transaction costs and creating the framework for world-wide interconnectedness. And within an imperial network, the cosmopolitan origin of capital sometimes raises doubts about the “nationality” of the companies that did follow the imperial preference system. In short, both the networks of business ownership and control as the networks of trade and investment do not have to fully coincide with any imperial network. I discuss this in the case of Belgium's expansionist history in Abbeloos 2008.

by the end of the nineteenth century per capita income levels within the early industrializing States considerably rose above those everywhere else (Pomeranz 2000; Pritchett 1997). The story of the Long Twentieth Century can therefore be framed as the story of how the *Great Divergence* and *The Great Specialization* unfolded (see for example Frieden 2006; O'Brien 1997; Williamson 2006). The crucial question then is how globalization, specialization and diverging economic development related to each other during this period. Given the importance of this issue, much of course has been written on the topic. In the context of this workshop I want to illustrate how commodity chain analysis can throw a fresh light on the problem and introduce the copper commodity chain as the concrete example that I study.

Natural Resources, Specialization and Development

The fact that poorer countries during the long twentieth century disproportionately specialized in the export of primary products, i.e. natural resources amongst which copper, is well established (Sachs & Warner 1995, 2001). But as Firebaugh and Bullock already underlined in 1989, the real issue is the *significance* of this correlation (Firebaugh & Bullock 1989). Why are countries that disproportionately export more natural resources on average poor countries?

Before looking at the relationships between globalization, specialization and development, it must be noted that one school of thought upholds that countries export more natural resources *because* they are poor. The resource sector is then seen as the "default sector" on which the national economy falls back in the absence of decent institutions or in the presence of armed conflicts (Brunnschweiler & Bulte 2008a&b; Mehlum, Moene & Torvik 2006; Robinson, Torvik & Verdier 2006). In this case the causation runs from local institutions to local developments against the rather invisible background of a global economy, leaving the very issue of specialization out of the picture. The proposition has led researchers such as Graham Davis to argue that "the [...] successes and failures of the mineral economies remain idiosyncratic, refuting any broad development patterns" (Davis 1998:225). To be sure, decent local institutions (whether understood as the political configuration, developmental policy, legal framework or property rights regime) clearly play an important role in national economic growth. And countries like Norway, Germany, USA, Canada or Australia show that resource abundance does not *imply* resource export dependence, pulling the rug from under the idea that rich natural endowments would *ceteris paribus* "curse" economic growth (Auty 1993; Bulte 2007; Ross 1999; Stijns 2005; Brunnschweiler 2008). The point, however, is that institutional configurations cannot be discussed outside of the evolving and globalizing circuits of political and economic power. Any institutional explanation that tries to do so will soon encounter the ultimate limit of its explanation: where do institutions come from (Engerman & Sokoloff 2005:661)? Studies that pursue this question already adopt a more global perspective, stressing how institutional configuration itself is negotiated by *local* factor endowments on the one hand and the *global*

political economy of expanding markets, imperialism and colonization on the other (Acemoglu, Johnson & Robinson 2001&2002; Sokoloff & Engerman 2000; for a critical assessment see Austin 2008). Looking then at the nexus between colonization, institutional configuration and economic development, Patrick O'Brien sees no clear correlations between types of governance and potential gains from participation in foreign trade for the period between 1815 and 1945. He maintains that "the contrasts across the regional economies of this periphery are not clear or salient enough to provide a basis for validated general conclusions about 'benign or malign economic effects' of colonial compared to indigenous governance" (O'Brien 2004:48). Concluding on a stylized fact, we can say that whereas we find a strong correlation between a country's macro-economic development and its level of *export* specialization during the long twentieth century, we do not seem to find a similar correlation between poor countries and a particular *institutional* specialization.

What if we turn the research question upside down: are countries poor *because* they export more natural resources? This question puts the issues of specialization and globalization up front. There is a longstanding tradition in the literature that blames international specialization as the cause of local growth failures. Economists like Andre Gunder Frank, Johan Galtung, Raúl Prebisch, Hans Singer or Gunnar Myrdal, have all looked into the mechanisms behind a situation commonly referred to as one of economic underdevelopment, reacting against the classical Ricardian idea that trade would benefit all trading partners and harmonize living standards (Myrdal 1957; Prebisch 1950, 1959; Singer, 1950; Frank 1966, 1967, 1975; Galtung 1971). National growth failures in this context are studied as variations to a systemic theme of *super*-structural constraints – in contrast to the *infra*-structural arrangements that are stressed in an institutional framework.

The economic *super*-constraints for countries that disproportionately export primary products are double. First, primary products, especially raw materials, have greater price volatility than do manufactures or services because of the former's lower price elasticity of *supply* (Jacks, O'Rourke & Williamson 2009). Economies that specialize in these exports do not spread their risk, yielding even greater volatility in total terms of trade. The developmental implications are clear. On the macro-economic level, revenue sources based on import and export taxes become volatile. On the micro-level, household incomes imperfectly protected from the volatility on the commodity market risk to become volatile as well. Both shocks show the importance of volatility on the *global* market and the role of *local* institutions in channeling the macro- and micro-economic impact of these shocks on private and public investment. But where the specialization in primary exports is particularly high, the forces of global volatility might offset the local capability to smooth out the impact (van der Ploeg & Poelhekke 2009).

Second, when primary products get traded for manufactures (assuming services are mostly non-tradable), these products *in general* face declining terms of trade. This is in part because of the lower price and income elasticity of the *demand* for raw materials and in part

because technological change in the production of manufactures entails reductions in raw materials costs or the production of synthetic materials. Ocampo and Parra (2009) show that during the twentieth century, the decline was quite substantial: overall commodity prices fell over half between the average of the first two decades of the twentieth century and the average for 1998-2003. Interesting, tropical agriculture experienced the strongest decline and metals the weakest one (resulting on average in the noted secular deterioration of the terms of trade). Aluminum, copper, tin, silver, lead and zinc show a fairly flat trend and sharp increases during the two major booms of the early twentieth and early twenty-first centuries. Ocampo and Parra (2009: 10) therefore conclude:

These observations suggest that, rather than discussing whether or not there was a *secular* downtrend in the barter terms of trade for commodities during the twentieth century, it would be more to the point to talk about the particular dynamics exhibited by this decline and how the evolution of different commodity groups differ.

Global Copper Commodity Chains

My research builds on the suggestion made by Ocampo and Parra by taking a closer look at the evolutions in the copper market during the long twentieth century. Moreover, I do not only opt for a specific *commodity* perspective, but for a *commodity chain* perspective, i.e. discussing the international different processing levels with regards to the copper production.⁵ This perspective builds on the idea that the natural resource business is about more than capturing the earth's minerals or vegetation and exporting it. These natural assets are turned into economic commodities through different production processes that need not to take place in the same region or country. From cashew nuts to copper, natural resources sit at the start of commodity chains that are often transnational, even transcontinental. The copper production chain is fairly easy to grasp. When we present a non technical overview, this chain basically entails 5 processes. At the beginning of the chain we find the mining of the cupriferous crude ore (typically containing only 0.5 to 5% copper).

⁵ The commodity chain concept has gained considerable popularity since it was initially developed by Anthony Hopkins and Immanuel Wallerstein (Hopkins and Wallerstein 1977; Hopkins & Wallerstein 1986; Wallerstein 2000 a&b). In recent years, scholars have launched similar concepts as value system, (global) value chains, value streams and the French *filière* concept. Despite the semantic confusion and theoretical differences between these concepts, each one of them, in my understanding, points to the same basic empirical objective. All want to explain why a specific chain is formed and governed as it is through time and on a certain geographical scale, how profits and bargaining power are divided through the chain, why more or less profitable parts of the chain are located in certain geographical areas and which actors in the chain gain from which activities (see Bair 2005 for an overview of the differences between the concepts). I unfortunately lack time and space here to go deeper into the significant heuristic and methodological added-values the commodity chain approach has to offer to the theoretical question on globalization, international specialization and local development.

The transformation of this crude ore into refined copper metal requires the concentration of the ore (20-35 percent Cu), the smelting of this concentrate to produce blister copper (96-99 percent Cu) and the refining of the blister into copper that is more than 99.9 percent pure. This pure copper is then fabricated into copper products such as wire rods, cakes, billets, nuggets and profiles. These are in turn consumed by different end users, mainly in the building, automobile and electrical industries.

See from this perspective, the question is not which country exports or exports “copper”, but too what extent the national copper business is primarily engaged in the mining, smelting or refining stage of the copper production chain. This is an important nuance as value is added to the natural resource while it goes “downstream” the production chain. Copper is only turned into an interesting market commodity at its purest form, negotiated at the London Metal Exchange since 1876, between American producers up to 1978, at the New York Commodity Exchange (Comex) since 1978 and at the Shanghai Metal Exchange (SHME) since 1992 [Appendix III]. These prices do not apply to the copper blister or matte that is retrieved after mining and smelting the ore. Although we can expect these prices to follow the same trend, they tend to be lower than the prices noted at stock exchanges, as the price for copper go up as copper goes down the production chain. Structural analyses rightly address the problem of potential declining world market prices for export-driven economies and the negative terms of trade that may characterize the international trade in natural resources but they often do not see that copper countries that are primarily engaged in mining tend to be hit harder than conventional graphs show. By looking at the question of specialization from this angle, the commodity chain perspective is complementary to a trade perspective in understanding the links between natural resources and (national) economic development.

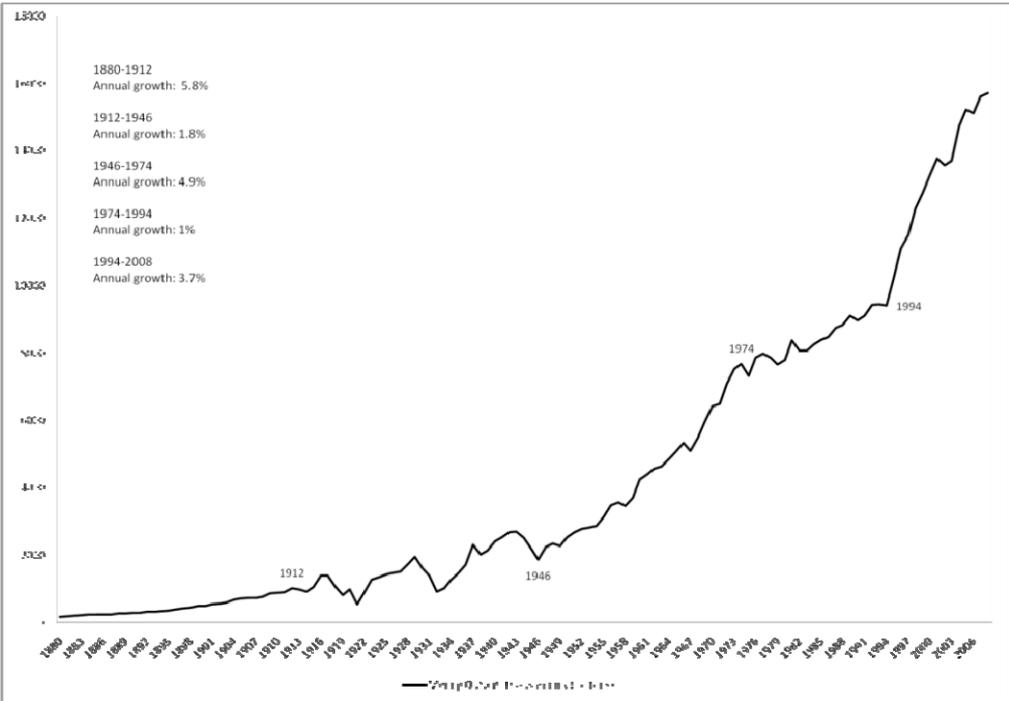
Studying copper has the advantage that the globalization of the copper is really a phenomenon of the long twentieth century. Despite the use of copper throughout history by different societies all over the globe, the creation of global copper commodity chains, characterized by specific patterns of growing economic and technological interdependency, took off around 1880, once industrialization was accompanied by the electrification of society. At that point the demand for copper grew in the industrialising states in reaction to the expanding electrification of society (Lipsev et al. 2005:54).⁶ The adoption of electrical power stimulated demand as copper proved to be an excellent conductor of electricity, easily drawn into wire and therefore the ideal material for carrying power from central generating stations to the end-users. However, as Samuel Truett points out, it was not all clear by the 1880s that copper would become the number one conductor for electricity, despite its intrinsic qualities. After all, the copper that was available on the market by the

⁶ Boyan Jovanovic and Peter Rousseau date the electrification era from 1894 until 1930 but point out that even in the United States it was only after 1915 that electricity finally pervaded businesses and households, once the diffusion of machines operated by stand-alone secondary motors took off and a centralized power grid was established (Jovanovic & Rousseau 2005: 1182).

1880s contained arsenic, nickel and iron impurities that reduced conductivity. Oddly enough, the only way to make copper the effective conductor that it could be, was through electrolytic refining, a process that in turn required abundant, cheap electric power (Truett 2006:68):

Electricity needed electrolytic refineries, which need electricity. Not surprisingly, the two had to evolve in tandem: it was not until 1891 [in the United States] that electrical generators using improved copper were themselves sufficiently improved to refine large quantities of quality copper at a cheap price.

The result of this productive tandem between electricity and copper is visible on graph 1. During the long twentieth century, copper production increased by a factor of 100, from 156.500 tons in 1880 to 15.700.000 tons in 2008.



In order to safeguard the supply, copper ores had to be brought in from regions outside of the industrializing centres. This happened during what Christopher Schmitz has called the “rise of big business in the world-copper industry” (Schmitz 1986, 1977, 2000). The rise of big business is an intriguing historical characteristic of the copper industry as it was both cause and effect of the globalisation process. Only firms with considerable financial and logistic assets could manage the complex task of placing foreign investments and setting up the necessary infrastructure with success. Meanwhile the increasing capital requirements,

transportation and transaction costs implied by the geographical expansion demanded a further move towards vertical integration within these firms of all four main stages of the production process: mining, smelting, refining the copper ores and to a lesser extent (semi)fabrication.⁷ In short, globalisation and the rise of big business went hand in hand. This gave the United States an advantage as the trend towards vertical integration inside the mining firm had started early here because of the United States' large and booming domestic market (which posed logistic obstacles but guaranteed sales) (Prain 1975:33). This is why the globalisation of the copper business was accompanied by a geographical shift in the industry's leading production centres, away from Great Britain in favour of American firms (Burt 1995; Leitner 2001). Inside the United States, there was another geographical shift from northern Michigan (leading production up to 1883 with the Calumet & Hecla Company) to the west, where large-scale producers opened in Butte, Montana (Anaconda Copper Company), Arizona (Phelps Dodge) and Utah (Kennecott) (Leitner 2004). This meant that the development of the world industry during its globalising phase was led by United States companies, both in terms of technology and corporate growth.

The expansion of trade patterns, financial transactions or business investments in the copper industry created spatial patterns that did not come about ad random. The supply of raw copper could have known quite a global outreach as a lot of countries contain copper in their soil. From Afghanistan to Zimbabwe, about 74 countries today contain copper ore deposits that are large enough to be listed as one of the country's natural resources. However, the part of the copper primary output that was not provided by the United States during the long twentieth century has been concentrated in three to four countries: Chile, Peru, Zambia and Congo. Economic factors matter as for most other countries the deposits were not significant enough to justify the necessary large investments. But politics matters as well. Globalization of the copper market started during what Eric Hobsbawm described as "The Age of Empire" (Hobsbawm 1975). Within this context, the copper business did not simply "globalise", it expanded from about 1880 along formal colonial or informal imperial lines as large vertically integrated firms, business networks and entrepreneurs from Europe and North America prospected and invested in peripheral regions, primarily Africa or South America, backed up in their efforts by financiers back home.

This way a dual geographical network became visible in the control of the copper industry of the early twentieth century. One network connected the United States of America with South America. The other networks connected Europe with colonial Africa and the European

⁷ The complex treatment of the geologically specific porphyry and strata-bound ores meant that companies had to devise the right technology within the firm to smelt the ores themselves. The integration of smelting had the additional advantage that it eliminated market transactions with outside smelters that could play out different mining companies against each other and force down the price for raw copper. Further integration from smelting to refining can be seen as an additional form of risk aversion, as short-run prices for refined copper (up to 99.95 per cent purity) were more stable than those for smelted copper ('blister' copper of around 93-98 per cent purity). Of course the entire growth of big business in the copper industry depended on the expectation that the rise in copper prices would make extensive prospecting and the huge sunk costs of setting up smelting and refining plants worthwhile.

imperial realm. The networks of control do not coincide with the networks of trade as the United States has by and large remained a self-sufficient market, while Chile always acted as a considerable exporter to Europe. Still, the ties within the networks strengthened after World War I, when European imports from Chile and the United States fell sharply as production gathered momentum in Britain's overseas Empire (notably Northern Rhodesia, South Africa, Canada and Australia) and in Belgian Congo (Prain 1975:71-72). Between the two Atlantic networks different price setting mechanisms existed up to the 1970s and the international trade for the larger part took place within these networks (Agostini 2006). Within the Eurafrikan network, tensions were also building up during the interbellum between different states such as Germany and Great Britain. Both countries, but also junior partners like Belgium, wanted to secure their own supply of the strategic copper ore within their own spheres of influences through the actions of state-sponsored corporations such as the British Metal Corporation, Metallgesellschaft and Union Minière du Haut-Katanga (for a preliminary analysis of the "imperialization" of business see Abbeloos 2008; Ball 2004; Vellut 1982).

Within the American and Eurafrikan network, the multinational corporations thus commanded production chains that connected parts of the world economy where the ores were extracted, the places where they were smelted and the zones where the ores were further refined. The refining happened, and still happens often where the demand is since there are virtually no savings in transportation costs in shipping refined copper over copper matte, while there are some advantages in locating refineries close to the fabricating plants so that the types of refined copper produced could readily be adjusted on demand (Mikesell 1979:26). Therefore the integrated copper firms set up and commanded a production chain in which smelters were established at the larger mines in Chile, Congo and Zambia, but refineries tended to be concentrated in the industrializing countries. See appendix II for the graphs on the patterns of specialization.

This situation remained about the same until 1970. For about hundred years, large vertically integrated firms from Europe and North America controlled production chains that extended along formal colonial or informal imperial lines. A shorter 20 years spans the period between 1970 and 1990 during which a number of states took control of a part of the production process on this market. The wave of nationalizations in the copper sector during the sixties and seventies cannot be considered as a matter of historical coincidence. They were manifestations of governments that, despite their socio-political differences, considered their countries to be economic non-sovereign. Within seven years, between 1967 and 1974, Congo/Zaire (1967), Zambia (1969), Chile (1971) and Peru (1974) all nationalized the local copper production [See appendix I]. In all four cases, copper had become a central commodity to the national economic development. At the onset of the nationalization wave, Chile and Zambia earned about 80 percent of its foreign exchange from copper, Zaire 50 percent, and Peru 30 percent (Mingst 1976:267). It seemed clear to these governments that the right to self-determination had to be enforced both politically and economically. Given

the direct legacy of colonization in many cases and the rise of multinational corporations that did not operate from but in The Third World, disappointment with the local economic development was coupled with an allergy to foreign investments. Another frustration amongst producing countries was the fact that copper refining did not have to occur close to the mines. It seemed that “powerful, vertically integrated, corporate structures controlling the entire copper production process [...] showed a distinct tendency to erect smelters, and more particularly refineries, in their home countries, rather than in those regions where the mines themselves were located” (Seidman 1975:8). The direct result would be that copper flowed out of the copper mining countries in a semi-refined stage and additional added-value was created outside these countries even when organized within the same multinational conglomerate. It is not hard to see how this could be interpreted from a dependencia-perspective as a clear illustration to the ways in which “The Global South” buttressed the development of “The Global North”.

This state of mind underlay the creation of the Intergovernmental Council of Copper Exporting Countries (CIPEC) between Chile, Zambia, Congo and Peru in 1967.⁸ Through CIPEC, these countries could streamline their policies vis-à-vis the transnational activities in their countries. And as Karen Mingst discussed, although these countries had not yet acquired substantial control of their copper interests when CIPEC was founded, the impetus and momentum for nationalization was channeled through CIPEC interaction (Mingst 1976:276). Already in 1967, Kenneth Kaunda met with Chile's President Eduardo Frei to discuss an arrangement to help maintain world copper prices and quotas, and looked into the possibility of increased cooperation between African and Latin American copper producers. Although no price-fixing agreement resulted from their talks, Frei's nationalization of the Chilean copper industry, beginning in 1967, probably stimulated Kaunda to take a similar step in Zambia (Time Magazine 1969). In 1972 CIPEC organized an Extraordinary Conference of Ministers meeting in Santiago during which a resolution was approved that guaranteed the support of CIPEC-members to the Chilean government (Faundez & Picciotto 1978:144). Before UNCTAD III, the spokesman of the African delegation said that African countries were in full solidarity with Chile, as the Chilean struggle to control the national copper resources was more than a domestic matter and pointed to a problem that all developing countries faced.

Since the 1990s a return to privatisation can be discerned and a new boom of transnational investments in the sector is taking place, albeit no longer along the old imperial lines. After

⁸ The creation of CIPEC was negotiated between Chile, Peru, Zambia and Zaire in Lusaka, June 1967. In 1975 Australia, Indonesia, Papua New Guinea and Yugoslavia joined the cartel. The main objectives of the cartel were to obtain information for its members, promote solidarity amongst them and develop a common policy “designed to foster, through the expansion of the industry, dynamic and continuous growth of real earnings from copper export.” In doing so, the memorandum of association was clear that the general aim was “to increase resources for the economic and social development of producer countries *bearing in mind the interest of consumers*” [my emphasis].

Agreement to establish the Intergovernmental Council of Copper Exporting Countries (CIPEC), Canberra: Australian Government Publishing Service, 1976, 1-2.

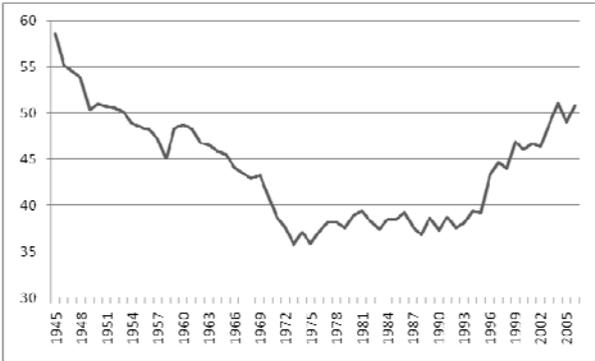
nationalization, the State is being confronted with an entire economic sector that needs to be managed successively within a competitive world economy. Furthermore, the control of production becomes “much more than a commercial exercises”, as Ronald Prain noted (Prain 1975:53). National, political and social implications become equally important factors that have to be weighed against the competitive behaviour of the copper business. That this can happen in different ways and with striking diverging results is shown by the contrasting experiences of Congo and Chile. Geologically blessed with the richest copper deposits of the Central African Copperbelt, Congo today serves as a textbook example of a country suffering from what seems to be a severe resource curse, with reduced investment in human capital, increased domestic political corruption and perilous reductions in economic diversification, all hampering long-term economic growth (Lalji 2007; Guenther 2008). Meanwhile, Chile has been hailed as a prime counterexample to any thesis that directly equates natural resource abundance with economic underdevelopment, not in the least because of its diversification into other areas such as forestry, fishing, wines, fresh fruit and other agricultural products (Maxwell 2004; Havro & Stansiso 2008). Chile has proven to be the only CIPEC country that successfully turned its resource wealth into an asset. It is also the only country that did not give up its state-owned copper producer.

Meanwhile, CIPEC could never mimic the decisiveness and influence of OPEC as it was unable to adequately control the total supply of copper, depend on a stable demand or devise a common production policy (Araim 1991; Alhajji & Huettner 2000). This was made clear once CIPEC faced a rapid decline in copper prices between 1974 and 1975 as a direct consequence of the industrial recession in the developed countries and the large-scale sales of Japanese surplus stocks. This put the common policy of the cartel under threat as the producer association announced to withhold supplies by the end of 1974 to push up prices, while the individual countries could prefer to push up production, minimizing losses in foreign exchange earnings and keeping up their share of the market (Morton & Tulloch 1977:117-118). This was a pressing problem within CIPEC since Congo and Zambia faced higher production costs than Peru and Chile (Prain 1975: 253; Zorn 1978:229-230). The latter duo was therefore more inclined to prevent prices from rising too high, afraid that substitutes such as aluminum might become attractive. Contrary to this long-term consideration, the short-term aim of Zambia and Zaire was more directed towards higher prices and a collective control of production (Panayotou 1979:205,211-213). Next to this problem of coordination, CIPEC faced two additional limits. The availability of recycled scrap copper, substitutes such as aluminum or stainless steel, and national stockpiles in United States, France, and Japan all undermined the possibilities to control supply and keep up prices. Next to this, the industrial recession showed how much copper demand was dependent upon the economic growth cycle in industrial societies. The downswing of the seventies could therefore not have come at a more inappropriate moment for the copper countries. Already in 1976 Karen Mingst warned that “producers should be less than optimistic regarding the probability of successful collusion” (Mingst 1976:267) CIPEC indeed proved to be unable to coordinate output cutbacks and harmonize production policies

among its members. In 1977, Chile did not decide to participate in a new attempt to curtail the production as was demanded by Congo, Peru and especially Zambia (Panayotou 1979:205-214). One of the reasons behind the decision was that in general the military junta had adopted a more accommodating position towards foreign investments in comparison to Allende, while in turn, the Zambian government refused to negotiate with the junta (Zorn 1978:228). Coupled during the eighties with the international debt crisis, the rise of the neoliberal doctrines on flexible markets, free trade and free enterprise, the failure of CIPEC and of the national development plans buried whatever utopian spirit and programs of national and State-led economic development the sixties had brought forward.

As a direct consequence to the nationalizations in the copper sector, the private investment pattern changed. Looking into the period between 1950 and 1976, political risk had most strongly influenced the investment pattern as reflected by the shift of new mine development to countries that were considered to be “safe”, such as Canada and the Philippines (Whitney 1976:59,75,124). Copper companies were willing to pay this “political premium”, as Roan Selection Trust prospected in Iran, Botswana, Indonesia and Australia, Anglo-American and Union Minière looked to Australia and Canada, while Kennecott and Anaconda also targeted South-Africa (Peter, de Kuyper & de Candolle 1995:57). The result was a further globalization of copper mining, one that negatively affected the market share of the CIPEC countries.

CIPEC (Chile, Peru, Congo, Zambia) mining output as a percentage of the total output outside the USA



Sources: Metallgesellschaft, various editions.

The nationalisation process in all cases separated primary copper production from further processing located outside the mining regions and still controlled by foreign copper firms. This created a bigger market for copper concentrate where previously vertical integration had been the norm. This increased insecurity for the state-owned companies as the interests of non-integrated smelters or refiners were not aligned with those of miners. The nationalisations of the seventies unfortunately created the conditions for outside smelters and refiners to play out different mining companies against each other and force down the price for raw copper, making the difference between the prices for raw and refined copper bigger. This was a return to the situation before the rise of big business and the creating of

an Atlantic market, when for example Welsh mining companies at the end of the eighteenth century were confronted with disadvantageous contracts from Welsh smelters (Allen 1923). Post-colonial policies tried to mediate this problem but as can be read from the graphs in Appendix II, the patterns of specialization did not substantially alter during the post-colonial period. In the case of Congo for example, both Mobutu and the DRC Government tried to curtail the export of untreated ore in an attempt to keep more value added at home from beneficiation in local concentrators and smelters. Despite this protective strategy, Katanga, according to the United States Geological Survey, today has only two official smelting facilities, one at Kolwezi (Luilu) and one at Likasi (Shituru) with a total capacity of 60.000 metric tons per year, making Congo a very small processing country in comparison to other nations. Of the 42 countries that contain smelting facilities, the Katangese smelting capacity ranks 31st.⁹

Conclusion

Looking for a mid-way between a strict “institutional” explanation for the diverging national economic development and a equally strict “imperialism” explanation, Patrick O’Brien in 2004 wrote the following (O’Brien 2004:2-3):

Perhaps the only viable entrée into any reconfigured discussion of this important question will be to elaborate upon the macro economic context for achieving gains from trade, namely the growth and structural changes that occurred for the world economy as a whole as the context for achieving gains from trade increased through time and conditioned prospects for economic growth across the geographical spaces and political boundaries of an evolving international economic order of colonized and autonomous regions of an integrating world economy.

This call to take the bigger picture and the *longue durée* more serious in studying economic development is increasingly being picked up by economist, especially with regards to the institutional underpinnings of development. To quote Dani Rodrik et al. that “there is growing evidence that desirable institutional arrangements have a large element of context specificity to them, arising from differences in historical trajectories, geography, political economy, or other initial conditions” (Rodrik, Subramanian & Trebbi, 2002:24) In his own attempt to bring history, context specificity and agency back into economics, Ravi Kanbur has underlined that the economist’s preoccupation to identify and model initial conditions can only lead to the study of the “more interesting, or at least less mechanical” question of

⁹ Calculated from the Mineral Resources On-Line Spatial Data from the United States Geological Survey project [<http://www-tin.er.usgs.gov/copper/about.php>, checked at 03.10.2006]

how these initial conditions came to be (Kanbur 2008). In doing so, he believes that history offers us two things. First, it provides us with a handle on how the contemporary agents in the economy—individuals, households, firms, interest groups, governments etc— altered their own initial conditions and how they responded to policy interventions. Second, history is also about the transmission of these past experiences into the present and how they “came to be embedded in the consciousness of the present generation”. Given this double historical legacy (the economic trajectory and the recollection of it), Kandur tries to understand why the same policy intervention elicits very different individual and social responses in different societies.

The narrative we have sketched on the creation and developments of copper commodity chains running from the “Global South” (Chile, Peru, Zambia, Congo) to the “Global North”, shows how initial conditions (resource endowments and technological advance) and subsequent political and economic responses, influence the spatial configuration of the production chain and local developments attached to this configuration. These local developments are as much political as they are economic. As Kanbur rightly stresses, the way contemporary agents value their situation will effect the ways they will try to alter that situation or not. With regards to the copper commodity chains, the nationalizations by the end of the sixties should be understood in this way. At the same time, the different outcomes of the efforts to control local copper production also show the limits to which local agency could influence upon the structures of trade, production and exchange. Furthermore, as can be seen from the graphs in Appendix II, the different policy shifts among copper producers did not radically alter the pattern of specialisation in mining or refining. Patterns that came about through the economic forces of supply and demand, through the business considerations of the large vertical integrated companies and within asymmetric geopolitical networks, outlined developmental paths that continue to influence regional economic development today.

To refrain, getting a grip on these patterns of specialization allows for a better understanding of the ways in which the global effects the local with regards to expanding markets and local development. All too often has the research agenda in this respect suffered from a micro-reduction (along institutional lines) or a macro-reduction (dependency-school, world-systems analysis). Commodity chain analysis can help to overcome this micro-macro divide by showing how the local interacted with another local in ways that did not come about ad random, but reflect differentials in the level of technological advance, political and economic power.

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Appendix I: The Copper Nationalizations

	year	In Effect	Origin of FDI	Company	Mine/Subsidiary	Compensation (million dollars)	Corporate share	
							Before	After
Chile	1967	1967	USA	Kenecott	El Teniente	80	100	49
	1969	1969	USA	Anaconda	Chuquicamata	175	100	49
					El Salvador		100	49
	1971	1974	USA	Anaconda	Chuquicamata	253	49	0
					El Salvador		49	0
					Exotica		75	0
					Rio Blanco	42	71	0
	1971		USA	Kenecott	El Teniente		49	0
1972	1972	France	Le Nickel	Cia. Disputa de Los Condes	13	86	42	
Peru	1974	1974	USA	Cerro	Cerro de Pasco	79	100	0
Congo	1967	1969	Belgium	UMHK	Gécomin	500	82	0
Zambia	1970	1970	USA	American Metal Climax	Roan Selection Trust	118	100	49
	1970	1970	South-Africa	Anglo-American	Zambian Anglo-American	175	100	49

Source: Kenneth W. Clarfield, Stuart Jackson, Jeff Keefe, Michele Ann Noble & A. Patrick Ryan, *Eight Mineral Cartels: The New Challenge to Industrialized Nations*. New York: McGraw-Hill, 1975:82.

In the case of Congo, seven years after political independence, the assets of UMHK were transferred under President Joseph Mobutu to a new company The Société Générale Congolaise de Minerais (Gécomin). Originally, the Republic of Zaire increased its participation in this new company. Eventually, Gécomin became a fully state-owned company and the name changed into La Générale des Carrieres et des Mines (Gécamines). UMHK set out to develop new mining and refining activities away from Katanga, although the company initially acted as a kind of advisory bureau to the operations of the Gécomin.

Zambia had become independent in 1964. In 1969 Kenneth Kaunda demanded that the owners of the mines gave 51% of their shares to the state. In 1970, the State took over 51% of the local copper industry, chiefly affecting the Roan Selection Trust, Ltd., 43% of which was owned by Manhattan-based American Metal Climax, Inc., and Zambian Anglo American, a subsidiary of Anglo American Corp. of South Africa Ltd.

In Chile, the government of Christian Democrat President Eduardo Frei Montalva "Chileanised" copper in 1966. It meant that Frei's government offered tax cuts in return for production increases and a majority share of the ownership of foreign companies. Kennecott took the bait and sold Chile 51% of its El Teniente mine in 1967 in return for \$80 million and a 50% cut tax. Anaconda however refused to sell a share of its Chuquicamata and El Salvador mines. The attitude fueled anti-imperialist critiques and the demand for complete nationalization. This was a bridge too far for the moderate Frei, who hanged on to his demand to acquire 51% share of Anaconda's Chuquicamata and El Salvador mines. As Time magazine reported in 1969, "Frei wants negotiation instead of legislation."¹⁰ The weather changed one year later when Socialist President Salvador Allende (1970-1973) followed Frei, expropriated the private mining companies and nationalized the copper industry in 1971.

In Peru finally, the military regime led by General Juan Velasco from 1968 onwards gradually expropriated or nationalized a large number of enterprises, including the largest copper mining corporation, the American Cerro de Pasco in 1974. It established the Peruvian State Mining Enterprise (Empresa de Minería Peruana- -Mineroperú) as the main state firm for development of copper and the Peruvian State Mineral Marketing Company as the new state mining marketing agency.

¹⁰ "Clamor over Chilean Copper", in *Time*. 27 June 1969.

Appendix II: Charts

Legend:

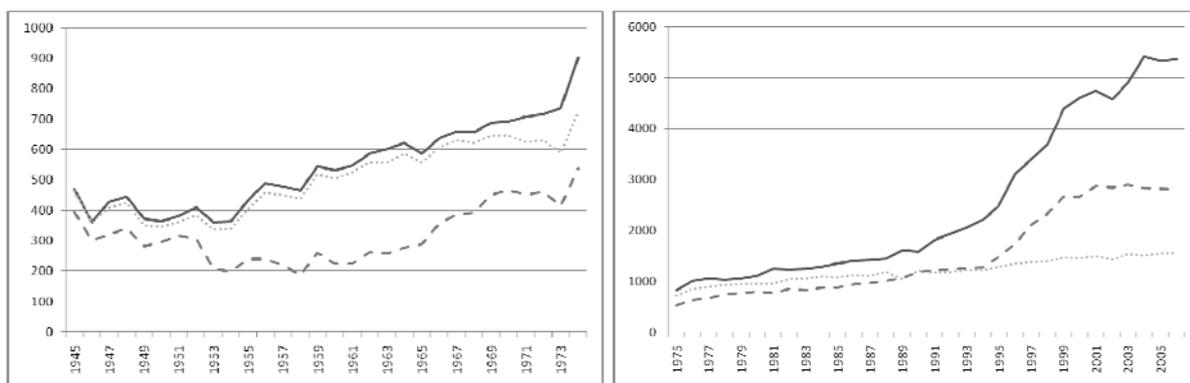
Line: Mining: generally to be understood the metal content of the utilizable ores (concentrates) by assay.

Dots: Smelter Production: collects the output of smelters which treat mainly ores. The Metallgesellschaft figures do not include secondary output. In our dataset, primary figures until 1990 from Metallgesellschaft, afterwards from USGS except where stated otherwise. After 1975 secondary figures are available through USGS Mineral Yearbooks. The World Bureau of Metal Statistics adds up the figures for primary and secondary smelting.

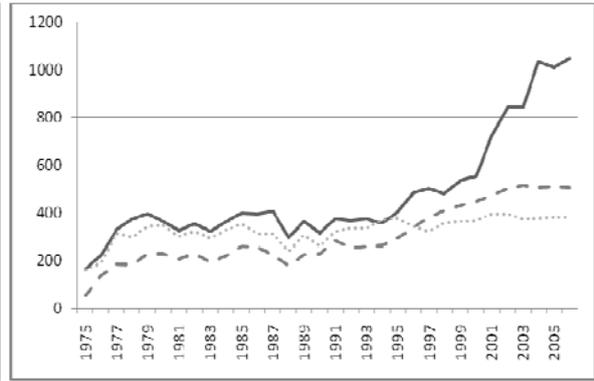
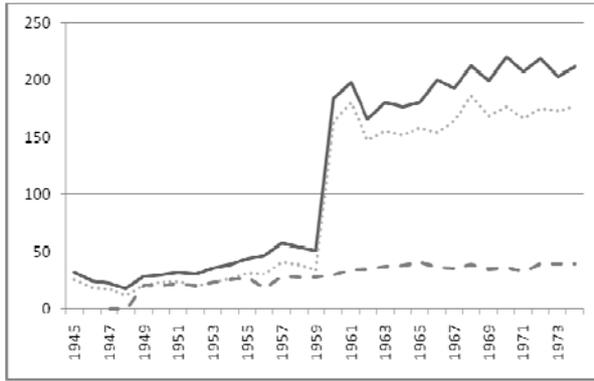
Stripes: Refined Primary Production: From 1976 onwards USGS mineral yearbooks distinguish between copper refined from primary or secondary sources, reported in metric tons. Before 1976 USGS Mineral Yearbooks generally represent total primary refined copper, reported in short tons. Metallgesellschaft includes in this category copper refined from old and scrap material but excludes the output by Ingot Makers.

Sources: The main source is the annual statistical overviews of the world copper market by Metallgesellschaft (*Statistische Zusammenstellungen* until 1966, *Metallstatistik* since). Additional information was found in the *Mineral Yearbooks* that The USGS Copper Statistics and Information publishes. The period between 1932 and 1992 is archived as the University of Wisconsin Ecology and Natural Resources Collection and online available. Later issues are directly consultable on the USGS website. The third annual statistics that were consulted are those provided by the World Bureau of Metal Statistics. Finally, the Engineering and Mining Journal's annual special issue on world mining filled in some blanks, especially with regards to the beginning of the twentieth century.

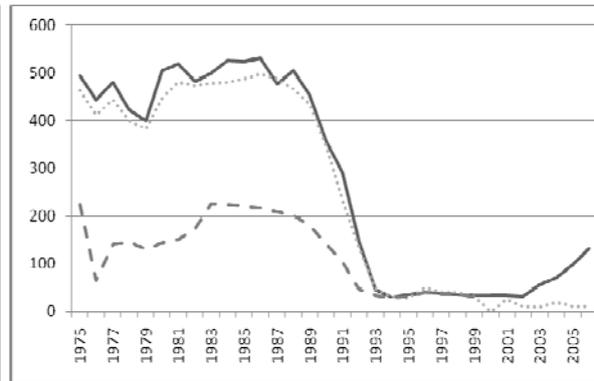
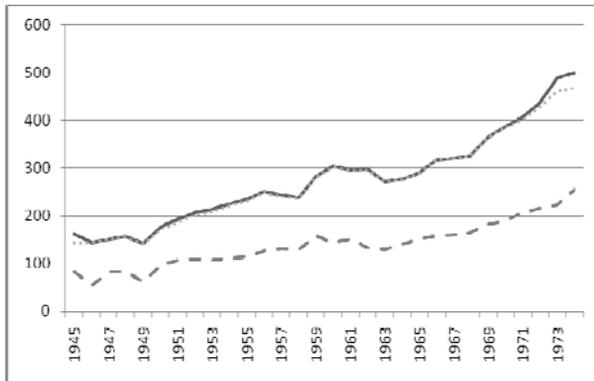
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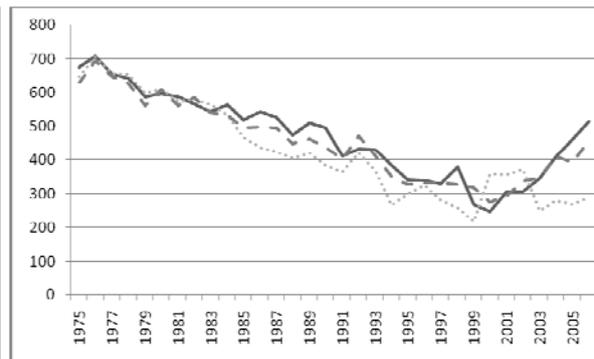
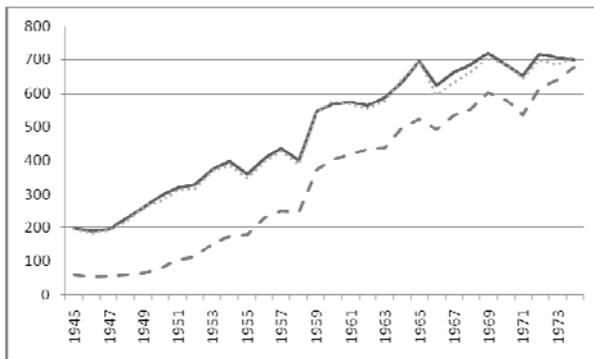
Peru



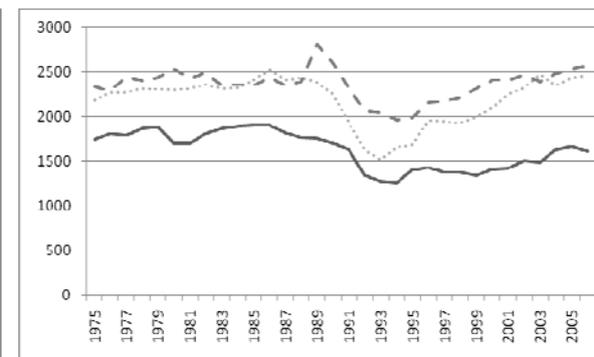
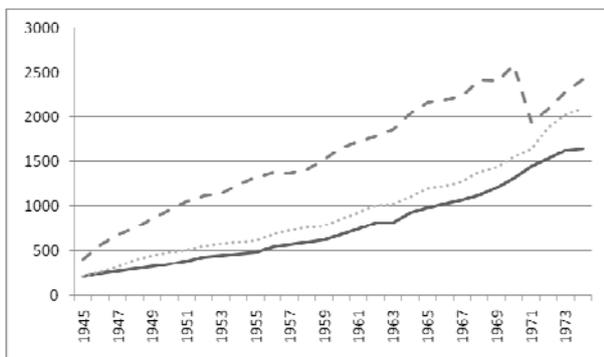
Congo



Zambia

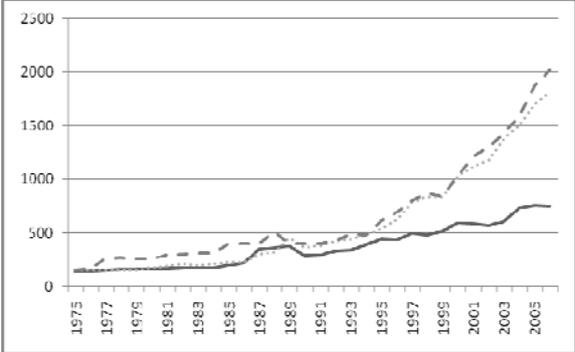
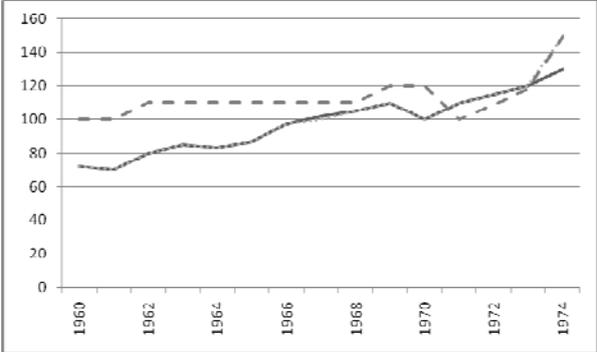


Europe

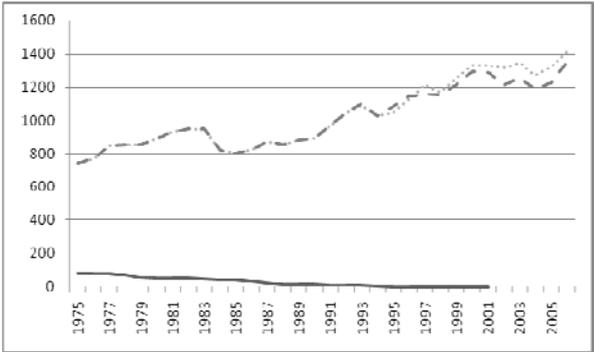
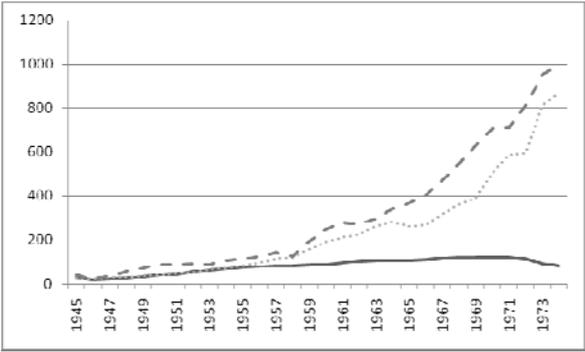


Note: Europe includes Albania, Armenia, Austria, Belgium, Bulgaria, Czechoslovakia, Finland, France, Georgia, Germany, Hungary, Ireland, Italy, Greece, Macedonia, Norway, Poland, Portugal, Romania, Russia, Serbia and Montenegro, Slovakia, Spain, Sweden, United Kingdom, and Yugoslavia.

China

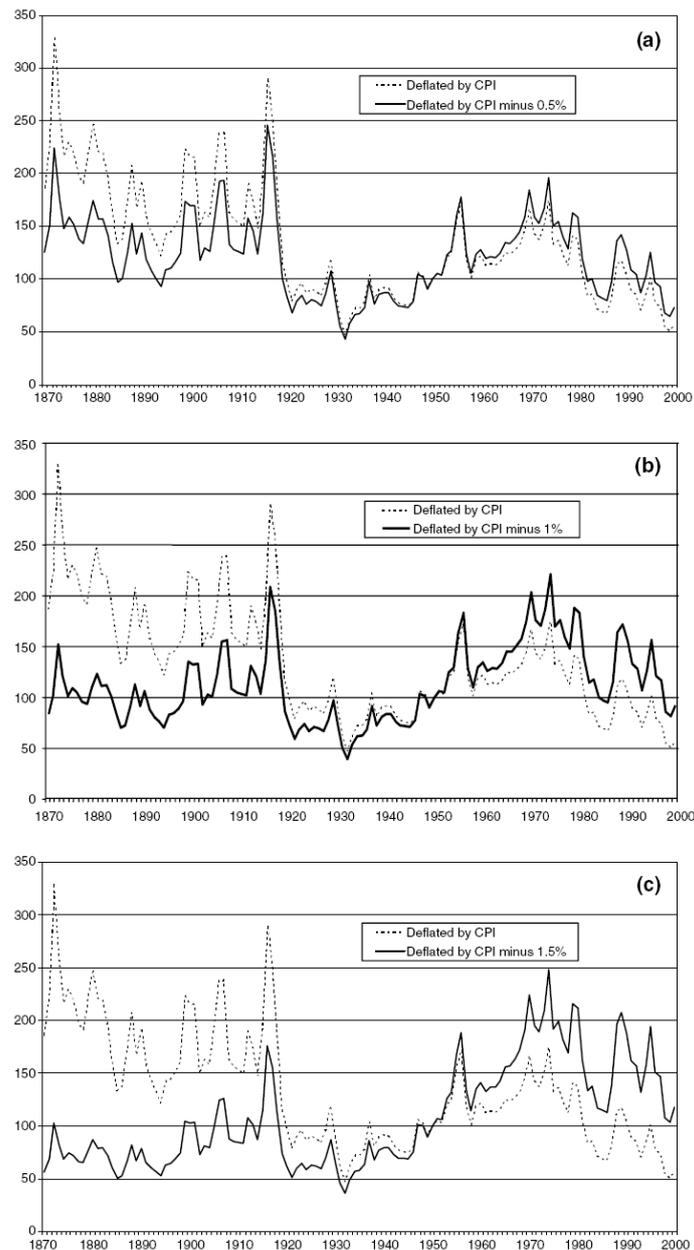


Japan



Appendix V: The evolution of the copper price, 1870-2000

In a recent article Peter Svedberg and John E. Tilton (2006) reconstruct the long-run trend in real copper prices between 1870 and 2000. They find that the prices over time, which decline when no adjustment is made to the deflator, display no tendency in either direction or are even significantly rising depending on the magnitude of the deflator adjustment employed. But whereas the overall trend might be up for discussion, some movements within the trend nevertheless always remain visible. We see that that the price of copper was more or less constant between 1870 and World War I, then fell over the following two decades, rose from the mid-1930s until the early 1970s, and has again fallen since. Below we present the main graphs that are used by the authors to show the impact on the overall trend when different deflators are used (p. 510).



Figures: index of the US producer price of copper from 1870 to 2000 with 1950 = 100. Copper price deflated by the CPI (Consumer Price Index) and the (a) CPI minus 0.5%, (b) CPI minus 1.0%, and (c) CPI minus 1.5%.