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NATURAL RESOURCES AND ECONOMIC DEVELOPMENT. SOME LESSONS FROM HISTORY

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RECURSOS NATURALES Y DESARROLLO ECONÓMICO. ALGUNAS LECCIONES DE LA HISTORIA

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RESUMEN

En este trabajo se destacan las "lecciones de la historia" que se pueden derivar del análisis histórico y la comprensión del pasado y el presente de cómo pueden conseguir las economías ricas en recursos naturales unas condiciones que les permitan un desarrollo basado en dichos recursos. La base conceptual de nuestra respuesta a esta pregunta se basa en tres ideas claves. La primera, que la abundancia de recursos naturales está estrechamente asociada con los niveles de desarrollo económico. En segundo lugar, destacamos que la abundancia de recursos naturales no es una situación fija. Es un proceso influido por cambios en la estructura de los precios de los recursos y la dotación de factores. Su aprovechamiento exige capital, trabajo, cambio tecnológico y adecuados marcos institucionales. Por último, la historia nos muestra que la calidad institucional es el factor clave para aprovechar la abundancia de recursos naturales y, especialmente, las rentas derivadas de su uso y explotación. Las formas en las que interactúan los recursos naturales con el desarrollo económico están condicionadas por el funcionamiento de los arreglos institucionales en al menos tres maneras: (i) la capacidad de las instituciones para limitar las oportunidades de búsqueda de rentas que desvían la innovación y los recursos de usos productivos; (ii) la competencia y la participación política se refieren a las reglas que rigen la selección de la jefatura de gobierno, la equidad y la imparcialidad de los procesos electorales, y las restricciones sobre el poder ejecutivo; y (iii) las características de las instituciones que reducen el riesgo de transacciones gracias al respeto de los derechos de propiedad. En resumen, la historia muestra con claridad que el capital natural no es neutral para el rendimiento de una economía, sino que es una pieza clave de los procesos de desarrollo económico en los que la calidad institucional es la variable fundamental para crear "maldiciones" y "bendiciones" de los recursos naturales.

Palabras clave: Recursos naturales y crecimiento económico, Maldición de los recursos naturales, Desarrollo económico.

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NATURAL RESOURCES AND ECONOMIC DEVELOPMENT. SOME LESSONS FROM HISTORY

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ABSTRACT

In this work, we highlight the "lessons from history" that can be drawn from a historical discussion and understanding of the past and present of resource-rich developing economies to obtain conditions for successful natural resources-based development. The conceptual core of our answer to those questions will be based on three key ideas. First, abundance of natural resources is closely associated with levels of economic development. Second, we emphasize that an abundance of natural resources is not a fixed situation. It is a process that reacts to changes in the structure of commodity prices and factor endowments, and progress requires capital, labour, technical change and appropriate institutional arrangements. Finally, history shows that institutional quality is the key factor to deal with abundant natural resources and, especially, with the rents derived from their use and exploitation. The ways in which natural resources interact with economic development are mediated by the performance of institutional arrangements in at least three dimensions: (i) institutions' ability to limit rent-seeking opportunities that divert innovation and resources from productive avenues; (ii) political competition and participation relate to rules governing chief executive recruitment and selection, the fairness and impartiality of electoral processes, and constraints on executive power; and (iii) the characteristics of institutions that reduce transactional risk through proper enforcement of property rights. In sum, history is very clear in showing that natural capital is non-neutral for economic performance but it is a systemic component of economic development where institutional quality is the key component to deal with and create "curses" and "blessings" of natural resources.

Keywords: Natural Resources and Economic Growth, Natural Resources Curse, Economic Development.

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Natural resources and economic development.
Some lessons from history[1]

1 Introduction

Economic development is no longer regarded as dependent only on the accumulation of physical and human capital. Academics now argue that there is a third form of "capital" or "economic asset", which is important to the performance of the system of production, consumption, investment, saving and welfare. This distinct type of capital is the natural and environmental resource endowment available to an economy, and it is commonly referred to as "natural capital". Capital refers to any stock that yields a flow of valuable goods or services now and in the future. Standard growth models emphasize the role of capital produced by humans and three types can be identified: manufactured capital (factories, buildings, tools and other physical objects identified with means of production), human capital (the stock of education, skills, culture and knowledge stored in human beings themselves) and social capital (connections within and between social networks). However, there is increasing consensus that natural capital is a fundamental determinant of economic development.

Natural capital consists of the various ways that the environment encourages production and supports most aspects of human existence. Two kinds of natural capital may be differentiated. First, there is non-renewable natural capital like fossil fuels and mineral deposits, which do not recover on a time scale close to the rate at which people use them. For all practical purposes, fossil fuels are literally consumed by use. This type of natural capital generally yields no services until it is extracted. The second type is renewable natural capital, which is active and self-maintaining, and uses energy from the sun and the Earth's core. Ecosystems are renewable natural capital. A forest or marine ecosystem provides a flow or annual yield of timber or seafood, and this flow can be sustained in the long run if the ecosystem is not deteriorating. The generation of natural resources is just one function of natural capital, yielding a flow of ecosystem services when the system is left in place (Ayres *et al.* 1997).

Natural capital is important for sustainable economic development, but increasing economic dependence on natural resource exploitation appears to be an obstacle to growth and development in most low- and middle-income economies in the world (Barbier 2005). The recent literature reveals a negative relationship between economic growth per capita and some measures of natural capital, which has been described as the "curse" of the abundance of natural resources (Auty 2001a, Sachs and Warner 1995, 2001, Gylfason 2006, 2007). Why should an abundance of natural resources often be connected to poorer economic performance? Is an abundance of natural resources a "curse" for economic growth? Are we faced with a general pattern or do these phenomena depend on specific conditions (e.g. technology or institutions) in an

[1] This text is a chapter in the book edited by Marc Badía-Miró, Vicente Pinilla and Henry Willebald, entitled *Natural Resources and Economic Growth: Learning from History* that will be published by Routledge in the spring of 2015.

economy, the characteristics of supply and demand, and the effect of different historical circumstances?

We divide this working paper into two sections following this Introduction. In section 2, we review the literature on the analytical and empirical relations between natural resource endowments and economic growth from a long run perspective. First, we introduce some concepts and a general overview of the debate (section 2.1). Second, we present two theses that represent the "natural resources blessing hypothesis", which was a commonly accepted idea of economic growth in the mid-20th century (section 2.2). Next we present three perspectives from the so-called "natural resources curse hypothesis": the "productive structure approach" (section 2.3), the "crowding out approach" (section 2.4) and the "factor endowment and institutional change hypothesis" (section 2.5), considering the different channels of cause and effect that can be identified.[2] We then refer this analytical framework to the recent literature on these issues and discuss the contributions made to the literature. Finally, in section 3 we present the "lessons from the history" for today's resource-rich developing economies and conclude.

2 Abundance of natural resources: which channels and what causality?

2.1 The debate: "curse" or "blessing"?

To discuss the impact of natural resources on economic development it is useful to distinguish between resource abundance (a stock measure of resource wealth), resource rents (the "windfall" flow of earnings derived from natural resources at some point in time) and resource dependence (the degree to which economies have access to alternative sources of income other than resource extraction). Obviously these concepts can be correlated, because economies with abundant natural capital may obtain high incomes from extraction, they may specialize in primary exports and they may become dependent on resource trading. However, some resource-rich countries are not dependent on resources and some relatively resource-poor economies are. As a consequence, there is much confusion about the exact meaning of the concept "resource abundance". This term may be used differently in different sciences and even in different areas of economics. For example, resource abundance usually means the amount of potentially exploitable natural resources in the natural sciences and in environmental economics, but in studies of growth economics, resource abundance means the amount of natural resources and reserves that have already been exploited (or are being exploited). The share of potential resources which eventually becomes economically exploitable depends on many factors such as economic and political conditions, and technological progress, and it is therefore an endogenous factor in the economic system.

In the literature of the 1990s, the "curse" was regarded as an almost unquestionable empirical fact. This idea was based on an index constructed in terms of primary exports as a share of GDP, but this is more a measure of dependence on natural resources than

[2] This section follows (van der Ploeg 2011, Willebald 2011).

their abundance. In these terms, the analysis concentrated on the channels which connect the two processes (natural resource dependence and economic growth) based on the conventional factors affecting economic performance, such as the accumulation of productive factors and technological progress. However, the literature has advanced systematically in bringing institutional arrangements into the analysis, considering (i) that institutions have increasingly entered the mainstream of recent economic thought; (ii) that the ownership of natural resources, whether in terms of the assets themselves or of the rents derived from their exploitation, is a key issue; and (iii) that both interest groups and the state are key agents in the formation and functioning of the property system. The results have been mixed, but there is a general consensus in the literature that some kind of "conditionality" is involved. The idea is that the quality of institutions plays a central role in the curse or the blessing of natural resources, and even when there are abundant natural resources in an economy it can perform well if its institutions are "good" (this would involve some kind of curse-reversal). Finally, the latest contributions in the literature have reacted to this consensus. A number of authors distinguish between natural resource dependence and natural resource endowment or abundance, and take into account alternative indicators such as the stock of natural capital or total natural resource assets. Empirical studies in this analytical line challenge the traditional view in that they invert the relationship, according to which resource abundance positively affects growth and institutional quality, and identify *"this apparent paradox* [with] *a red herring"*(Brunnschweiler and Bulte 2008). Does this assertion mean we are faced with a meaningless debate? On the contrary, the debate constitutes a real "research programme" and is especially useful to enhance our understanding of the economic performance of economies that are based on the successful exploitation of natural resources.

Our aim in this section is to review the literature on the relationships between abundant natural resources and economic performance. In recent years the debate has moved to less extreme positions, so that mixed results are now accepted and certain institutional aspects are actively considered. The discussion has also broadened the notion of economic performance to include concepts other than economic growth, like poverty, inequality and various welfare indicators. However, the debate has largely concentrated on analyses of the second half of the 20thcentury, and new light can be shed on the discussion by applying these concepts in the long run and with an historical perspective.

2.2 Natural resource abundance as a blessing

In the last quarter of the 19th century and up to WWI many countries grew rapidly. This economic boom was closely associated with export-led industrial expansion in Western Europe and the United States, and the temperate regions of North and South America, South Africa and Australasia also benefited. Industrializing European countries needed cheap natural resources from the "New World" and the new settlement economies needed to import capital and labour to expand their capacity to provide resource-based exports. A key factor in this world development was the transport revolution at the end of the 19th century (O'Rourke and Williamson 1994, O'Rourke *et al.* 1996), which made it possible for these new regions to join the world economy.

According to Myint (1958), trade was the channel whereby idle resources –in particular natural resources– in new economies were brought into productive use and fuelled economic growth. According to the "staples theory", development in many countries has been built around the expansion of export sectors in general, and natural resource exports in particular. The "vent for surplus theory", a Smithian concept, suggests that trade was the means by which unexploited resources started generating wealth and economic growth (Innis 1930, 1940, Bertram 1963, Watkins 1963, Chambers and Gordon 1966, Smith 1976, Southey 1978, Altman 2003, Wellstead 2007). Both frameworks consider the presence of excess resources in the form of land and natural resources which are not fully exploited in a closed economy, and international trade allows these new natural resources to be exploited to increase exports and foster growth (Barbier 2005; and Marwah2015 for the cashcrop export cycle).

In the ventforsurplus theory, Adam Smith analysed trade for a country which had been isolated but then entered international trade. Trade provided new effective demand for the output of surplus resources which would have remained idle had there been no external trade (so that exports can be increased without reducing output for the domestic market). Smith implied that internal demand was inelastic because there was zero growth in the demand for resources to enable society to benefit from the new market economy. According to Harold Innis, the economic history of countries with abundant natural resources has been dominated by the discrepancy between the centre and the margin of western civilization.

> *"The raw material supplied to the mother country stimulated manufacturers of the finished product and also of the products which were in demand in the colony. Large-scale production of raw materials was encouraged by improvement of techniques of production, of marketing, and of transport as well as by improvement in the manufacture of the finished product*" (Innis 1956, p. 385).

In these terms, agriculture, industry, transportation, trade, finance, and even governmental activities tended to be subordinate to the production of the staple for a highly specialized manufacturing society. Therefore, the staple theory is a subset of the export-led growth hypothesis, and it is designed to explain the growth and economic development of resource-rich economies. Since the 1990s it has come in for heavy criticism (Altman 2003), but it remains an important contemporary framework for economic analysis and it can help answer some of the questions about the curse and blessings of an abundance of natural resources.

Meanwhile, the abundant literature on the development of the United States emphasizes the positive impact of resource endowments on welfare levels in the late 19th and early 20thcenturies (David and Wright 1997, Mitchener and McLean 2003, Wright and Czelusta 2004, Czelusta and Wright 2007). Wright (1990) connects the United States' leading role in manufacturing to technological progress and learning potential in the American mining sector. Similarly, David and Wright (1997), Wright (2001) and Wright and Czelusta (2004) claim that mining encouraged the creation of prestigious educational institutions and diffused knowledge to other sectors (Wright 2015), an argument which has points in common with the idea of biased technological change induced by the abundance of natural resources (Boyce 2013). The literature has also examined other successful country cases in depth, such as Botswana (Hillbom 2015)

where state ownership and management of abundant natural resources has been driven economic performance.

A number of authors have recently proposed models to represent how the opening-up of a previously closed economic region to staples led trade can lead to economic development (Lundahl 1998). Some of them employ the concept of the "endogenous" or "moving" frontier (Hansen 1979, Di Tella 1982, Findlay and Lundahl 1994, Findlay 1995), and others extend the framework of the staple approach to include the nature of export staples, regional characteristics and institutional structure (Schedvin 1990). These models also offer an explanation as to why resource-based development may be initially successful but may not be sustainable in the long run. Various late 19th and early 20th century economies specialized in primary exports while maintaining only a small manufacturing sector (an activity which does not usually expand in this type of economy), and the dynamic demand for primary products during the golden age (1870-1913) allowed them to continue to grow. However, they remained vulnerable to falls in international commodity prices relative to the prices of manufactured goods. Once a country specializes in resource-based exports it may find it difficult to move away from its primary specialization and take the path of modern manufacturing (Badia-Miró and Ducoing 2015, Hillborn 2015, Rubio 2015, van der Eng 2015). Frontier-based development (Barbier 2007, 2015, Willebald 2015) is symptomatic of a pattern of economy-wide resource exploitation that generates little additional economic rent, and the rents that are produced are not reinvested in more productive and dynamics sectors (Bertola 2015). This form of economic life, which is typical of "new" economies, was able to offer high standards of living but only for as long as domestic resource supplies and world demand remained dynamic. Declines in demand or increases in supply would have severe consequences for the internal political economy of a country, leaving it weakly positioned to react to the challenge of finding a new basic product to trade. These economies face the risks of the "staple trap". In this sense, the small domestic market, and the factor proportion–an abundance of land relative to labour and capital–create a comparative advantage in resource intensive exports (staples).

> *"Economic development will be a process of diversification around an export base. The central concept of a staple theory, therefore, is the spread effects of the export sector, that is the impact of export activity on domestic economy and society"* (Watkins 1963, pp. 53–54).

In this situation the creation of backward, forward and final demand "linkages" in the export of particular staples would be a key element in the success or failure of a country's long-run economic performance (as in the case of Indonesia, van der Eng 2015), or the comparison between Mexico and Venezuela (Rubio 2015) and between Argentina and Australia in the long run (Duncan and Fogarty 1984). To sum up, these kinds of models involve notions where the export orientation of some economies presents lock-in effects whereby the main primary specialization blocks structural change and impedes economic growth.

Lastly, we need to consider the numerous theories which posit the positive outcomes from expanding fiscal capacity due to rising tax receipts in the context of a natural resources boom to provide an explanation of the natural resource blessing (Palma 2000, Hujo 2012) or, at least, a partial explanation of this process (Badia-Miró and Ducoing 2015).

2.3 Productive structure approach: the curse and primary specialization

We may distinguish a couple of viewpoints in this approach. In the first place, the allocation of resources between productive sectors with different spillover effects on aggregate growth emphasizes the role of specialization in economic development. Economies in which production is based on natural resource abundance, where manufacturing and services account for only a small share of the productive structure, will grow more slowly. Manufacturing and services lead to a more complex division of labour and have more potential to incorporate knowledge into production and thus develop a sustainable growth trajectory. Second, the so-called Dutch disease is an important concept in the literature on the natural resource curse hypothesis. Economies with abundant natural resources are subject to periodic rises and falls in their performance because commodity prices on world markets are variable and from time to time new exploitable natural resources are discovered. This process generates volatility in export and fiscal earnings and a real appreciation in the value of the country's currency, hurting other export industries. These two viewpoints both refer to productive structure, but they emphasize different aspects when it comes to identifying the origin and the evolution of the curse. The first highlights the predominance of primary activities as a long run process with cumulative changes, while the second offers an explanation for the kind of sudden change in which the movement of relative prices is the centre of the process.

2.3.1 Primary specialization and restrictions affecting structural change

In the Development Theory propounded in the 1950s, ideas about growth and structural change were closely related. The argument was that development involved the reallocation of productive factors from sectors with low productivity to activities with high productivity, which are characterized by increasing returns and complementarities (Rostow 1953, Lewis 1954, 1955, Myrdal 1957, Rosenstein-Rodan 1957, Hirschman 1958, Nurkse 1962). As the industrial sector was supposed to constitute the main activity where higher levels of productivity could be obtained, the process would involve changes in the economic structure of the economy, and manufacturing would gain a greater share of GDP and employment. Manufacturing generates productive spillovers, forward and backward linkages, and economic and technological externalities which maintain increasing returns in the long run. Hence, economic growth is hampered in countries with an economic structure based on a high share of primary activities, and the abundance of natural resources is a curse that impedes economic development. As Hillbom (2015) has argued, specialization dependence poses significant challenges for the economy of Botswana, even though the country could be considered a successful case.

In the 1960s the theoretical and empirical centre of attention changed, and the focus shifted to modelling economic growth based on an aggregated production function (Solow 1956, Swan 1956). In this new approach, productive activities and structural change by definition played a secondary role, and the assumption of exogenous technical progress meant that less attention was paid to matters of sector performance. However, the subject came back into the limelight in mainstream theories of economic

development in the 1980s with the New Theory of Economic Growth (NTEG) and the endogeneity of technical progress. These models have two or three sectors; there are increasing returns to intensive research and development (R+D); and there is greater productive diversification to obtain positive rates of growth in the long run. The new theories in the fields of international trade and the geographic location of productive activities (Krugman 1991, Grossman and Helpman 1994), the new theory of economic growth (Aghion and Howitt 1992) and the new theory of development (Ray 2000, Ros 2000) are clear of recent theoretical and empirical contributions to the subject (Cimoli *et al.* 2005). Given that primary activities do not by nature form endogenous cores of innovation and technical progress, economic dependence on natural resources results in low output growth. The historical evidence certainly confirms these theoretical insights where de-industrialization, induced by global forces, offers a potential offset to the gains from trade (Williamson 2011).

There are two alternative positions to the mainstream literature, which identify primary specialization with low economic dynamism. One of them is derived from the Marxist and structuralist tradition, and the other proposes a framework derived from the Schumpeterian analysis of the economic growth and innovation.

First, we consider the unequal development view, whose proponents include the Latin American Structuralist school and some pioneers of the Development Economics school (Prebish 1950, Singer 1950, Myrdal 1957, Seers 1962, Dixon and Thirwall 1975), as well as scholars identified with Marxism and Dependency theory (Baran 1957, Frank 1967, Furtado 1969, Emmanuel 1972, Wallerstein 1974, Amin 1975). This literature includes various models and many of the key elements feature in the North-South trade model (Krugman 1981). The idea is that if trade reinforces the economic supremacy of the leading region this is because *"a small 'head start' for one region will accumulate over time, with exports of manufactures from the leading region crowding out the industrial sector of the lagging region"*(Krugman 1981, p. 149). One of the main theories of the unequal development of the centre (industrial core) and the periphery, with its specialization in primary production, is the Prebisch-Singer Hypothesis. According to this idea, there is an inherent long-run trend for (non-oil) primary product prices to fall relative to manufacturing prices. This may not be a problem if it is the result of increased technical progress and the country concerned is able to export more and improve its position in world markets. However, worsening terms of trade will affect the economic growth of a developing country because the income elasticity of demand for manufactured goods is much greater than the income elasticity of commodities. This combination of relatively low income elasticity and worsening terms of trade means, then, that countries which rely on primary goods will grow more slowly than economies that based on manufacturing industries.

Recent post-Keynesian and post-Kaldorian theories address this issue and formalize these limitations on the balance of payments and economic growth (McCombie and Thirwall 1994, McCombie and Roberts 2002) in terms of the differing income elasticities of demand for exports and imports, and the dynamics of the current account. A vast empirical literature has attempted to examine the main trends in the evolution of the terms of trade. Results point to an improvement for the exporters of commodities in the long 19th century. According to Williamson (2011), this strengthened export specialisation in these products and hindered industrialization. In the short 20th century, the economic crisis of the 1930s and the shocks of the 1970s caused a sharp deterioration in the terms of trade for commodity exporters (though not for oil exporters

in the second crisis) (Ocampo and Parra-Lancourt 2010, Serrano and Pinilla 2011). Some authors have noted that the price volatility factor has probably been very damaging to the growth potential of countries which are highly dependent on exports of commodities (Williamson 2012).

In the 1960s, the concept of a gap in technological capacity emerged from the contributions of authors concerned with technological dynamics and their influence on international trade and economic growth (Posner 1961, Freeman 1963, Hirsch 1965, Vernon 1966). On this view, technological asymmetries are the key to explaining international movements of goods and services between countries, and national specialization patterns. Innovation is not diffused immediately, and technologically advanced countries enjoy an initial advantage and can expand their share in the world market. In this light, economic growth in the long run depends on a country's ability to narrow the technological gap. Modern models have improved the formalization of technological dynamics in the Neo-Schumpeterian tradition and have included the notion of heterogeneity between agents (Dosi 1988) and the analysis of aggregated economies (Dosi *et al.* 1990, Fagerberg 1994). Industrialization is a process of "accumulation of capabilities" which led from traditional, especially rural, economies to others driven by industrial activities (nowadays also advanced services)"*able to systematically learn how to implement and eventually how to generate new ways of producing and new products under conditions of dynamic increasing returns"* (Cimoli, *et al*, 2005, p.2). The Evolutionary School takes the "industrialist" ideas and emphasizes that technological change is the motor of structural change and the source of international specialization. In economies that successfully internalize new paradigms and technological trajectories, changes in sector composition appear and technical progress diffuses to the whole economy. This process needs the existence of connections between codified knowledge, tacit knowledge and various capacities to transform information into innovation and development (Nelson and Winter 1982). The notion of technical change and industrial dynamics as evolutionary process (Dosi and Nelson 2010) has led authors to consider the systemic relationships between enterprises, organizations and institutional structure. "National Systems of Innovation" have become a central concept of models (Freeman 1987, Nelson 1994, Cimoli and Dosi 1995), and there is a privileged level of analysis referring to the interactions and co-evolutionary dynamics between the sub-domains of scientific knowledge, development, improvement, and adoption of new techniques, political and legal structures, and cultural domain-shaping values, norms and customs (Dosi 2007, p. 2).

Like in the mainstream, heterodox views therefore focus on why economies that base their productive expansion on the exploitation of natural resources find it difficult to obtain high rates of growth. The "curse" is expressed as a permanent process of economic divergence.

2.3.2 The Dutch disease and volatility of natural resource prices

A resource price boom or windfall may lead initially to an expansion of the export sector. Nevertheless, the impact on the economy as a whole is uncertain. A real appreciation of the rest of the economy is observed (Corden 1984) when some of these windfall earnings are spent in the country (directly or indirectly through the state). In addition, increases in labour productivity in a booming export sector pull the work force

and attract economic resources away from other economic sectors. This drives a de-industrialization process and reinforces real appreciation due to excess demand which the domestic market cannot satisfy (Gylfason 2001). As a result, the economy will in the long run become specialized in production and exports based on natural resources, and consequently economic growth will be slow and intermittent.

At the same time, primary-product exporters which exploit comparative advantage by specializing in one or two products expose themselves to higher price risk than those that have a wider range of export products (Blattman *et al.* 2007, Williamson 2011). Thus, the Dutch disease tends to reduce the level of total exports or bias their composition away from the kind of high-tech and high-value-added manufacturing and service sectors that may be particularly beneficial for economic growth(Badia-Miró and Ducoing2015). The fact that exchange rates are unstable causes uncertainty, and this may hurt exports, investment (Herbertsson *et al.* 1999, Sachs and Warner 1999a) and other trade activities including foreign investment (FDI), which suffers as investment opportunities other than natural resource exploitation dry up. Hence, natural capital tends to crowd out foreign capital (Auty 1997, 2001b, Gylfason 2007). Besides, industries based on natural resources can pay higher wages (Sachs and Warner 2001)and also higher interest rates than other export and import activities, which can become increasingly uncompetitive in world markets.

Turning to the effects of high volatility on commodity prices, countries with abundant natural resources undergo booms and busts at irregular intervals. Recent research into the endogeneity of resource dependence suggests that volatility may be the quintessence of the resource curse (van der Ploeg 2011). This evolution makes for irregular changes in export earnings and periodic real appreciation of the national currency, and it works to the detriment of other export industries and foreign capital inflows in a process that has come to be called the Dutch Disease (Corden 1984, Neary and Wijnbergen 1986, Krugman 1987, Torvik 2001, Drelichman 2005).

2.4 Crowding out: natural capital displaces other capital modalities

In the structure of recent models an abundance of natural resources or heavy dependence on them influences a variable "x" which hampers economic growth (Sachs and Warner, 2001). So the task of theorists and empirical researchers has been to identify the mechanisms that connect these two processes. These channels can be seen in terms of crowding out: an abundance of natural capital tends to displace other kinds of capital and hinder the expansion of production (Gylfason 2004, 2007). We focus on rent-seeking activities, the influence of "bad" institutions, effects on the generation of human capital, and the expenditure and saving patterns associated with abundant natural resources.

2.4.1 Rent-seeking, weak institutions and appropriability

In many developing countries, large natural resource rents, especially in combination with badly-defined property rights, imperfect markets (or the absence of markets) and permissive legal structures may lead producers to engage in uncontrolled rent-seeking. This diverts resources away from economic activities that are socially more fruitful and it may hamper economic growth (Gelb and Associates 1988, Tornell and Lane 1998,

1999, Ascher 1999, Baland and Francois 2000, Auty 2001b, Gylfason 2001, Torvik 2002).

Huge resource rents may lead to a concentration of economic and political power in the hands of elites which use their rents, once in control, to tilt income and wealth distribution in their favour and thus secure and perpetuate their hold on power. The consequences of this are persistent high inequality (Gylfason and Zoega 2003, Williamson 2011), weakened democracy and political instability, all of which slow growth (Karl 1997, Acemoglu *et al.* 2001, Collier and Hoeffler 2002, 2005, Dalgaard and Olsson 2008) where political clientelism constitutes the main expression of the natural resources "trap" (Collier 2007, Hillbom 2015 and Marwah 2015). Governments may be tempted to spoil markets by granting enterprises or individuals privileged access to common-property natural resources, or they may offer producers tariff protection or other favours at the public expense, creating competition for favoured treatment among rent seekers. Extensive rent seeking may generate corruption in business and government (Krueger 1974, Gray and Kaufmann 1998, Leite and Weidmann 1999, Baland and Francois 2000, Torvik 2002), distort the allocation of resources, weaken fixed investment (by crowding out physical capital), lead to increased public spending (Ross 1999, Atkinson and Hamilton 2003), reduce economic efficiency and work against social equity. Moreover, abundant natural resources may induce a false sense of security among people and governments and cause the state to miss opportunities to impose good economic management and establish high institutional quality (Sachs and Warner 1999b, Auty 2001a, 2001b, Bulte *et al.* 2005, Sala-i-Martin and Subramanian 2013). In other words, abundant natural capital may crowd out social capital (i.e. the infrastructure and institutions of a society in the broad sense of culture, cohesion, law, legal system, rules, customs and so forth), dragging down economic growth (Gylfason 2004, Auty 2006). Corruption, inequality and the absence of political liberties can, then, be identified as the main channels through which rent-seeking corrodes social capital. Moreover, all three of these factors hinder economic growth and perpetuate poverty, and this effect is not independent of the political regime. In fact, the evidence indicates that the curse is more likely to occur in presidential regimes (and other non-democracies) than in parliamentary systems (Andersen and Aslaksen 2008).

According to Auty (2001b), different kinds of natural resource endowments may have different effects on economic performance. It is especially interesting to distinguish between "point resources" (e.g. mineral and energy resources, activities where the use of capital is intensive) and "diffuse resources" (e.g. cropland and livestock). The former generate greater opportunities for rent-seeking and corruption than the latter, and the negative consequences for economic growth are more serious. In this regard, Isham *et al.*(2005) argue that export concentration in point resources is strongly associated with weak public institutions, and these are in turn strongly linked to slower economic growth. In fact, as Woolcock *et al.* (2001) show, natural resources-rich economies and different types of resources put diverse pressures on community structures, institutional capacity and state-society relations. Economic growth is more likely to be undermined when natural resources and the rents derived from them (Auty 2015) are more easily captured and controlled by a narrow elite. Bulte *et al.*(2005) propose similar empirical studies but evaluate the curse in terms of indicators of human welfare, showing that resource-intensive countries tend to have lower levels of human development. This implies that the resource curse phenomenon does not just affect economic growth but has wider impacts, and countries that rely on point resources tend to perform worse.

Boschini *et al.*(2007)demonstrate that the effect of natural resources on economic development is not determined by resource endowments alone but by the interaction between a the type of resources available to a country and the quality of its institutions. This combination of factors is the "appropriability" of a resource, a concept which captures the probability that an abundance of natural resources will lead to rent-seeking, corruption or conflict, outcomes which in turn hobble economic development. In economies where resources are highly appropriable, the abundance of resources may have different effects on the dimensions of development (economic growth, inequality, structural change), and the curse may turn out to be a process that is conditioned by the influence of institutional arrangements (Willebald 2015).

2.4.2 Human capital and skill intensity

Natural resource abundance may reduce private and public incentives to accumulate human capital because of high levels of non-wage income (e.g. dividends, social spending, low taxes) and because the predominant tendency in resource-rich economies is to underestimate the long-run value of education (Birdsall *et al.* 2000, Gylfason 2001, Wood and Mayer 2001, Bravo-Ortega and De Gregorio 2005). In others words, abundant natural capital may crowd out human capital. In terms of the productive structure approach, activities based on natural resources like agriculture, fishing and forestry are less high-skill labour-intensive and probably also less high-quality capital-intensive than other industries, and as a result they confer relatively few external benefits on other industries (Wood and Berge 1997), tending to impede learning by doing, innovation (Sachs and Warner 2001, Papyrakis and Gerlagh 2004), technological progress and economic growth in general.

2.4.3 Expenditure patterns: incentives for saving and investment

Natural resource abundance may prevent private and public incentives from promoting saving and investment (Papyrakis and Gerlagh 2006). As the owners of natural resources accumulate more, we expect the demand for capital to fall, leading to lower real interest rates and slower growth (Gylfason and Zoega 2006).

Manufacturing often enjoys increasing returns to scale and creates positive externalities. A decrease in the scale of manufacturing thus depresses the productivity and profitability of physical capital and accelerates the decline in investment (Gillis *et al.* 1996, Sachs and Warner 1999a). In others words, abundant natural capital may crowd out physical capital. Natural resource wealth reduces the need for savings and investment as the abundance of natural resources provides a continuous stream of future windfalls, and welfare seems less dependent on the transfer of man-made capital to future periods (Corden 1984, Gylfason and Zoega 2006). This process may be a contributing factor in retarded development of financial institutions, a state of affairs which discourages saving, investment and economic growth. Besides, it is not only the volume of investment that is important but also the quality of expenditures, and individuals or governments all too commonly invest windfall rents in unproductive projects.

In economies in which a large proportion of total wealth is held in the form of land, total savings can be used either to accumulate capital and attend to market demand or to invest in land (Kurz and Salvador 1995, Foley and Michl 1999). When land is still

relatively abundant, the aim of investing in land is to reap the benefits that will come from future price rises. As land prices increase, capitalists invest a larger part of their wealth in it and this slows down capital accumulation. On the other hand, when land is not abundant and the frontier has already been occupied, increases in land rents depress profits and boost capitalist expenditure up to the point at which capital accumulation virtually stops. In both cases resources are diverted away from the alternative of capital accumulation. Since investment is the main source of growth and technical change, economies in which land rents and/or opportunities for land speculation are higher will grow less.

2.5 Factor endowment and the institutional change hypothesis

A last and very influential approach in recent economic historical research into the reasons why some resource-dependent economies have developed more successfully than others claims that the basic explanation of economic development is to be found in the interaction of critical exogenous factors such as geography, climate and institutional legacy. These factors may explain why certain recently settled regions in temperate areas, such as Australia, Canada, New Zealand and the United States, entered the 20thcentury as "more developed" countries than the resource-dependent tropical plantation and peasant economies of Africa, Asia and Latin America (Barbier 2005).

Acemoglu *et al.*(2001) suggest that different European colonization strategies created different sets of institutions. "Neo-European" states were set up where colonial settlers tried to replicate European institutions, and the emphasis was on private property and controls against government power. But, at the other extreme, there were also "extractive" states in which these two aspects were not considered. Colonization strategy and settlement were influenced by geography, climate, disease and environmental factors. In less suitable places for settlement where malaria and yellow fever resulted in high mortality rates among settlers, it was more likely that extractive states would be formed. On the other hand, if European colonists could safely settle in an area they created better institutions. Long after European colonies became independent the colonial legacy of the institutional matrix persisted, and it has been a key factor in determining whether economic performance would be good or bad (path-dependence).

Engerman and Sokoloff (1997, 2002) argue that the key factor endowments were not just abundance of land and natural resources relative to labour in the New World, but also the soil, the climate and the size and density of native populations. Their view highlights the fundamental importance of the extreme differences so commonly found in New World societies, where inequalities in the distribution of wealth, human capital, and political influence due primarily to factor endowments (or initial conditions more generally) have persisted since the early days of the colonies. The causal relationship is between factor endowments, social and economic inequality and the generation of institutional arrangements that create the conditions for economic development. The proponents of this approach emphasize the role of factor endowments, arguing that the colonies that came to make up the United States and Canada were quite unusual in the New World, because their factor endowments predisposed them toward paths of development with relatively equal distributions of wealth, human capital and greater population homogeneity as compared with the most regions of Latin America.

Other authors have studied the connection between specific environmental conditions (climate and tropical locations) and economic performance, presenting evidence that the former directly influenced the latter (Kamarck 1976, Bloom and Sachs 1998). However the predominant current view is that factor endowment explains economic growth but only through the indirect impact of institutional factors (Hall and Jones 1999, Easterly and Levine 2003), and that there are no convincing arguments for direct causality.

3 What can we learn from history?

Whereas the previous section offered a brief review of the different analytical and empirical approaches dealing with the "curse" and "blessing" of natural resources as a conceptual context for our proposal, this section will highlight the "lessons from history" that can be drawn from a historical discussion and understanding of the past and present of resource-rich developing economies to obtain conditions for successful natural resources-based development (in the sense of Barbier 2011 and 2015).

The history of economic ideas concerning the relationship between natural resources and development has shifted from enormous confidence in natural wealth as a motor of economic growth, which continued until the mid-20th century, to an increasing conviction about the impossibility of creating sustainable conditions for resources-based development. This conviction took the form of difficulties associated with primary specialization (developmentalists, Latin American structuralists, dependence theorists and neo-Schumpeterians) until the 1990s, when a new "orthodoxy" emerged in the debate. Since 2001, hundreds of academic studies have examined the "resource curse," meaning the claim that natural resource wealth tends to have perverse impacts on economic growth, equality and welfare conditions. The results have been mixed, but there is a general consensus in the literature that some type of "conditionality" is involved. The idea is that the quality of institutions plays a central role in the curse or the blessing of natural resources, and that an economy can perform well even when natural resources are present in abundance provided its institutions are "good". However, a number of scholars have recently questioned this view and cast doubt on the intensity of the effect and the causality of the relationship.

Stijns (2005)argues that natural resources can have both positive and negative effects on economic growth, and Domenech (2008)shows in a case study of Spain (1860-2000) that mineral resources had a positive effect on industrialization by 1920.Wright (2015) also stresses the important role played by natural resources in the economic development of the United States. Ding and Field (2004) use more appropriate indicators of natural resource abundance in the form of natural capital according to World Bank measures rather than the share of GDP represented by commodity primary exports to demonstrate that the impacts of natural resources on growth disappear under these conditions. Finally, Brunnschweiler (2008) and Brunnschweiler and Bulte (2008) present evidence that overturns the causality hypothesis, proposing instead that resource abundance has positive effects on growth and institutional quality.

Can economic history contribute to this debate? Can long-run studies and historical episodes for different regions provide new insights to help us understand this apparent paradox?

> *"The analysis of resource rich countries draws on macroeconomics, public finance, public policy, international economics, resource economics, economic history and applied econometrics. It also benefits from collaboration with political scientists and historians."* (van der Ploeg 2011, p. 407).

In other words, it is an interdisciplinary field where economic history has a central role to play. The conceptual core of our answer to those questions will be based on three key ideas drawn from our review and discussion of academic descriptions of the problem, analyses and results:

- Abundant natural resources are non-neutral for economic development.
- Abundance is an endogenous process.
- Institutional quality is the key factor to deal with abundant natural resources.

First, abundance of natural resources is closely associated with levels of economic development. At the beginning of the 21st century, only 5 per cent of total world wealth consisted of natural capital. However, divergence between regions was the dominant norm, and where the ratio was barely 2 per cent for high income OECD countries, it was 25 per cent for lower middle income and 30 per cent for low income countries. Evidently abundance of natural resources is non-neutral for development and the different cases we review are clear illustrations of this insight. As Barbier (2015) states, at some historical stage, all economies faced the scarcity of their natural resources and the ways in which they resolved the restriction could explain a lucky country trajectory (Lloyd 2015), a litany of successive failures or the design of effective public policies to avoid the curse or strengthening the blessing (Dugstad and Sandvick 2015, Marwah 2015, Peres Cajias 2015 and Cazcarro *et al.* 2015).

As economic historians, we have the opportunity to address a promising research program to assess the dimensions, evolution and impact of natural capital on economic development, which will in all likelihood end by obliging us to reconsider some of our historical interpretations from the Industrial Revolution to the present day. Regions such as Latin America and Africa, where natural resources were always a key factor for economic development, are especially attractive in this respect. Rents from natural resources in the sense defined by Richard Auty (Auty 2015), the degree of appropriability of such rents (Willebald 2015) and the resulting distribution among the different social classes comprise the central concepts for an interpretation of long-run development in peripheral economies. This approach will also provide a good framework to analyse the impact of backward and forward linkages in mining cycles on the economy as a whole. In this context, Chile made only slow progress with industrialization before the Great Depression, providing an example of a country which did not suffer "Dutch Disease" effects (Badia-Miró and Ducoing 2015). For African cases, good institutions could foster economic growth (Hillbom 2015 for Botswana) but bad government institutions and rent-seeking behaviours created barriers to growth in Nigeria during the oil cycle (Marwah 2015).

Second, we emphasize that an abundance of natural resources is not a fixed situation. It is a process that reacts to changes in the structure of commodity prices and factor endowments, and progress requires capital, labour, technical change and appropriate institutional arrangements (see van der Eng 2015 for Indonesia and Rubio 2015 for Mexico and Venezuela). This abundance is not a given, therefore, but is part of the evolution of the economic system. This is an idea which is far from new but in fact goes back a long way.

> *"Resources are highly dynamic concepts; they are not, they become, they evolve out of the triune interaction of nature, man, and culture…"*(Zimmerman 1933, p. 4, quoted in Ding and Field 2004, p. 2). Natural resources *"should not be seen as merely a fortunate natural endowment, but rather as a form of collective learning, a return on large-scale investments in exploration, transportation, geological knowledge, and the technologies of mineral extraction refining, and utilization"*(Czelusta and Wright 2007, p. 186).

The endogeneity of natural capital is as obvious in historical analysis (Cazcarro *et al.*2015 show for water and irrigation) as it is absent in the long-run interpretations in economics. History teaches us that "curses" and "blessings" are constructions –they are the result of the socioeconomic system– and the exploitation of natural resources means dealing with opportunities and challenges with profound consequences on the historical process in the societies concerned. Thus, successful experiences of economic development in countries like Australia and Canada highlight the fact that institutions promoting the interaction between enabling and receiving sectors are fundamental to science-based and innovation-driven growth in resource-based economies. It is crucial, therefore, to develop institutional structures to support knowledge capabilities in the growth of natural resource based industries (Ville and Wicken 2015).
Finally, history shows that institutional quality is the key factor to deal with abundant natural resources and, especially, with the rents derived from their use and exploitation.

> *"Most developing countries are resource-rich and natural resource abundance tends to foster predatory political states that use the rents to relax market discipline and buy political support, distorting their economies in the process so that competitive economic diversification falters and growth collapses… Meanwhile, macro policy failure damages micro policies, …by distorting prices and incentives, depressing genuine saving rates and shortening time horizons to secure immediate survival"* (Auty 2003, p. 15).

In other words, the ways in which natural resources interact with economic development are mediated by the performance of institutional arrangements in at least three dimensions (following Siddiqui and Ahmed 2013): (i) institutions' ability to limit rent-seeking opportunities that divert innovation and resources from productive avenues; (ii) political competition and participation relate to rules governing chief executive recruitment and selection, the fairness and impartiality of electoral processes, and constraints on executive power; and (iii) the characteristics of institutions that reduce transactional risk through proper enforcement of property rights. "Curses" and "blessings" are determined by the way how societies deal with rent-seeking, political

competition and property rights, and the historically prevailing institutional arrangements express those relationships.

In sum, history is very clear in showing that natural capital is non-neutral for economic performance but it is a systemic component of economic development where institutional quality is the key component to deal with and create "curses" and "blessings" of natural resources.

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