

# ***“Brazil”<sup>1</sup> in the Capitalist World-Economy from 1550 to c. 1800***

## **An Empirical Demonstration through the Sugar Commodity Chain<sup>2</sup>**

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*Brazil is passively caught and dragged in the vortex of that struggle, and its economic evolution will feature major world events that understand and explain themselves only in the universal scenario and along with the general history of mankind. (...) Truly, there is not the economic history of this or that country in the contemporary world, now history consists of the entire mankind (Caio Prado Jr.).*

*Because everything that is sweet, even if filthy, delights (Antonil).*

This article presents evidence that, due to the amount, the public and private agencies involved, and the employment of slave labor, the production, trade, and consumption of sugar from the sixteenth century has built what has recently been acknowledged as the “global commodity chain,” thus contributing to the formation of the capitalist world-economy. To achieve this goal, this article reconstructs the sugar commodity chain from 1550 to 1800, identifying and locating the required activities for sugar to be produced and consumed. Sugar had been produced in the Portuguese Atlantic Islands

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<sup>1</sup> The word *Brazil* is quoted because this is the name of a political entity that only started to exist later on. In the time period hereby examined, this term, which we have used for convenience, named several different and isolated regions of the Portuguese colony in America.

<sup>2</sup> This English version is slightly modified in relation to that published in *Economia e Sociedade* 19 (3):40, 2010. A first version of this article was presented at the Second Brazilian Colloquium on World System Political Economy, held in Florianopolis, Brazil, 2008. The author thanks the Department of Sociology from the University of Maryland for the opportunity to expand the bibliographic research on this topic.

since the middle of the fifteenth century.<sup>3</sup> In the early decades of the sixteenth century, when the Portuguese government, supported by capitalists of several nationalities, started to produce sugar in their South American colony, they were in fact displacing part of the chain—raw material planting and production of sugar—to the Portuguese possessions in the Americas. The success of such displacement affected the entire chain, lowering prices and increasing consumption, as well as attracting the attention of other governments and capitalists to the sugar business and to the slave trade, which, in turn, resulted in new readjustment in the public and private agencies involved. This article is neither intended to describe nor analyze such a scenario. The intention is simply to depict the sugar commodity chain and show that when Portugal colonized their American lands through the production of sugar, they inserted this region in the emerging capitalist world-economy. Empirical evidence will be provided to Quijano and Wallerstein (1992: 549), who have written that “the Americas were not incorporated into an already existing capitalist world-economy. There could not have been a capitalist world-economy without the Americas.”

The interpretation of Portuguese American colonization as a “constitutive act of the modern world-system” (Quijano and Wallerstein 1992: 549) may be acknowledged as a research line derivation of the Brazilian economic history classical texts. In fact, if according to Celso Furtado (1995: 5), this colonization was “an episode of the European commercial expansion,” Caio Prado Júnior (2008: 29, emphasis added) thought that “as a whole, *and from a worldwide and international perspective*, the colonization of the tropics acts as a large commercial enterprise, (...) designed to exploit the natural resources of a virgin territory *for the benefit of the European trading*,” which would portray, for this author, the meaning of colonization. Meanwhile, Fernando Novais suggests that colonization acquires meaning when seen as “a part in a set of mechanisms that, *by promoting primitive accumulation*, tended to facilitate the overcoming of institutional and economical barriers that were still hindering the expansion of modern capitalism in Europe” (2005: 41, emphasis added). Novais has brought attention to the fact that Caio Prado could not make this same connection because he insisted on “the

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<sup>3</sup> On the history of sugar industry, see, among others, Galloway (1989) and Schwartz (2004).

tradition of Brazilian historiography, always less focused on the connections between the history of Brazil and the general history of Western civilization" (2005: 40).

From the perspective adopted here, the meaning of colonization is not the acceleration of primitive accumulation and of the capitalist accumulation itself, but the formation of a specific social historical system, the modern world-system, a synonym for capitalist world-economy. In this cited article, first published in 1969, Novais came very close to this formulation when relating colonization with "the historical process of the development of modern capitalism, the transition from commercial to industrial capitalism" (2005: 40). Later, in a 1984 publication—that is, ten years after the release of Immanuel Wallerstein's *The Modern World-System*—the same author wrote that "the colonial system was an integral and articulated part of this global structure—which Wallerstein called 'Modern World-System'" (Novais 2005: 187–88). Despite the record, Novais kept the 1969 interpretation, according to which true capitalism begins with the English Industrial Revolution, in the late eighteenth century:

The background mechanisms—the transition to capitalism in its essentially contradictory process built up tensions that, from a particular point (*second half of the eighteenth century*), triggered conflicts, which forced *readjustments in the whole and in parts of it* (2005: 189, emphasis added).

This author believes that in the second half of the eighteenth century the transition to capitalism was still ongoing. In the quotation, Novais also acknowledges the existence of a whole, which, however, remains unclear. In our view, such a whole is the capitalist world-economy, which consists of a political subsystem—made up by the national states altogether—and of an economic subsystem which includes the commodity chains that span the globe and which entail different production processes, labor relations, and production means.

Besides Novais, Luiz Felipe Alencastro and Pedro Puntoni are historians who have used the term "world-economy." Alencastro explicitly admits that the world-economy is the social historical system within which the economy of the South Atlantic developed, revolving around the slave trade (2000). However, when employing the term "system" to refer to the economic, political, and cultural ties between Brazil and Africa, he is implicitly giving to these relations a certain

autonomy and self-determination that they do not have. Puntoni (1999), makes several references to the works of Wallerstein, who also uses the term “world-economy.” However, neither Alencastro nor Puntoni make any attempt to show or clarify what they mean by world-economy. And perhaps because they take the position of historians, they are not interested in considering the methodological developments of the assumption of a world-economy as a unit of analysis, such as, for instance, making certain generalizations and questioning internal-external division.<sup>4</sup> In fact, when Puntoni analyzes the struggles of different Dutch groups for the leadership of business and foreign policy of the United Provinces, he states that the motivations for the creation of the East India Company were internal (1999),<sup>5</sup> even when the dispute was for the control of colonial trade. In addition, the establishment of this company in 1621 was, according to this author, the solution found by the General States to overcome the division that threatened the very existence of the Republic, and that would both allow them to fight Spain by means of a war and through the control of trade in their colonies. If the problems faced are clearly global<sup>6</sup> and involve conflicts among different nations, why continue to argue that the mobiles are internal?<sup>7</sup> We believe that such insistence stems from the non-adoption of a world-economy as the unit of analysis.

Acioli and Menz acknowledge this unit of analysis to show that the use of Asian goods in the slave trade involved, in the same network, Europe, America, Africa, and Asia (2008). We could say that, by highlighting the extensions of the sugar commodity chain, this text adds to the efforts of these two historians.

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<sup>4</sup> It is also possible that the resistance of historians to new theories and generalizations prevents them from admitting the existence of an extensive system such as the world-economy. To consider the perspective of the “World-System Analysis” would mean to exceed the boundaries of history as an academic discipline, which has its consequences. However, as Abu-Lughod has noted: “*original insights are often possible when scholars risk crossing disciplinary lines*” (1989: viii).

<sup>5</sup> “The dispute which resulted in the founding of the Company occurred in Holland itself, their mobiles were internal” (Puntoni 1999: 49).

<sup>6</sup> We must remember that the East India Company (EIC), founded in 1600, and which probably served as a role model for the WIC, was already fulfilling the same functions in that region of the globe.

<sup>7</sup> Perhaps the author is using “internal” to designate agents located or resident in a given territory or jurisdiction, even though its area of operation is the world market.



Among the Brazilian historians who can be considered resistant to a systemic view, we may mention João Fragoso and Manolo Florentino, whose co-written book<sup>8</sup> has as its main objective to show that, contrary to what Furtado, Caio Prado, and Novais claimed, the late colonial economy (1790–1830) “enjoyed a reasonable autonomy in the face of fluctuations in the international market” and, largely, “the reproduction of this reasonably autonomous structure” (Fragoso and Florentino 2001: 56). This was due to the fact that big Traders (the resident mercantile class) controlled the key elements for its reproduction: slave labor, land, and food. In our opinion, such a conclusion is associated with the choice of the unit of analysis, which, in the case of these authors, is the economy or the colonial society. Now, once (consciously or unconsciously) chosen, or in other words, once defined, a unit of analysis—individual, family, company, nation-state, national-economy, or otherwise—will always *seem* to be endowed with self-determination and own objectives, the first of which is self-preservation and expanded reproduction. However, this does not mean that self-reproduction of the unit in discussion is determined “internally.” Take, for example, someone who sells his or her workforce to a capitalist enterprise. Undoubtedly, his or her motivation is to obtain the income to buy the means of subsistence that he or she needs to survive. However, in pursuing this goal, which is personal, he or she is inserted in the circle of capital accumulation. Without much questioning, we accept that, in order to understand the lifestyle, values, and the potentialities of a worker, we need to study, as did Marx, the logic of capitalist accumulation. Thus, we have two logics or sets of interests: that of the individual who sells the workforce and that of the wider process to which this individual belongs and serves. In this case, we hardly ever will say that the individual is autonomous. However, suggesting that he or she enjoys a reasonable autonomy is very little information, since this is expected to happen in any human relationship.

The crucial matter seems to be the choice and definition of the unit of analysis. As stated above, if the scope of the unit of analysis is expanded, we can move from the individual to the family, and then to the class, to the national economy, and to the global society. As long as we can do such expansion and identify relationships that are external to the chosen unit, or even, as long as the reproduction of

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<sup>8</sup> Fragoso and Florentino 2001.

this unit depends on the exchange with external agents, we are not dealing with a self-determined unit. The movement stops when we come to the larger, encompassing, and self-contained unit, which is the historical system we call the world-economy. Following this line of thought, dichotomies like local-systemic<sup>9</sup> or internal-external<sup>10</sup> lose their consistency, because the analysis expands to the upstream and downstream threads of the chosen unit. Thus, the researcher will have to broaden his or her field of study to embrace this entire set of relations or exchanges, regardless of the political jurisdiction in which he or she is located.

As the commodity chain concept spells out the mutual dependencies of producers, traders, and consumers of all stages required to produce a commodity, it seems to be particularly useful to examine both the spatial extent and the insertion (or not) of a particular process or economic activity in a process that is even greater.

Below this article focusses on the concept of commodity chains according to the World-System Analysis. The next section depicts the several stages of sugar production to identify and spatially locate its components, whose overview will be given by the design of the commodity chain.

## COMMODITY CHAINS AS AN EXPRESSION OR SPATIAL CONCRETIZATION OF THE CAPITALIST WORLD-ECONOMY

Once the capitalist world-economy has been adopted as the unit of analysis for the study of social structural changes, there is a need to understand this historical system. Therefore, we will consider the conceptual and historical construction made by its creator, Immanuel

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<sup>9</sup> Every activity (economic, political, cultural, etc.) is always carried out in a concrete, well-established, and even measurable space. Therefore, when viewed in itself, every activity is always local. However, if it is possible to insert this activity in a process that extends beyond this immediate space, then it is no longer exclusively local. If the extension of this process is global, that first activity can only be considered local if we isolate it from the process to which it belongs. That is why we say that, from a systemic perspective, the local-systemic dichotomy fades away.

<sup>10</sup> In his study of the cocaine global commodity chain, Gootenberg concludes that the holistic approach made possible by the concept of commodity chain "helps us overcome the traditional divisions between internal and external factors and between economic and non-economic factors in the history of Latin America, binary prospects shared by the neoclassical and dependency concepts" (2006: 322).

Wallerstein, to whom: "[I]n the late fifteenth and early sixteenth century the European world-economy, as we may call it, emerged" (1999: 21). The modern world-system is defined as a single economic entity which accepts different forms of political entities (empire, city-states, nation-states) and cultures. And because is greater than any of them, it comes into being as a "world-system." In the words of the author:

And it is a "world-economy" because the basic linkage between the parts of the system is economic, although this was reinforced to some extent by cultural links and eventually, as we shall see, by political arrangements and even confederal structures (Wallerstein 1974: 15).

How is the world-economy implemented? Or, what is the extent or territory of a world-economy? The implementation and extension of a world-economy is measured by the variety and extent of its networks of production and exchange, which, in more technical terms, Wallerstein and Hopkins have defined as "commodity chains." The authors describe this concept as the "linked production processes that had always crossed multiple frontiers and that had always contained within them multiple modes of controlling labor" (Wallerstein and Hopkins 2000: 221). More specifically, a commodity chain consists of all stages and/or processes required for the production and trade of a product, from its inputs to final consumption.

The commodity chains are set in a peculiar world division of labor. The concept of division of labor is one of the pillars of the Wallerstein's entire argument, since it is precisely the existence of different activities (technical division) in different regions (spatial division) held by different ethnic groups (ethnic division) with different wages (income division) that enables the development of the European world-economy, which, as we have seen above, from its very beginning in the sixteenth century includes the Iberian colonies in America (Wallerstein 1979: 142). One aspect of the technical division of labor is the employment of different forms of labor control (an expression that Wallerstein uses to describe what in sociology we know as "labor relations"), which imply, and effectively give rise to political, economic, and social stratifications, "which in turn had different political consequences for the "states," that is, the arenas of *political* action" (Wallerstein 1974: 84).

Finally, the concept of commodity chain prevents the separation of what the pursuit of profit and power in the capitalist world-economy has brought together. In fact, the concept of commodity chain compels us to place in the same *continuum*, state agents, merchants, consumers, and workers of several political jurisdictions or areas in which are located the activities in which the process of production, trade, and consumption of any goods can be decomposed. From this point of view, what is seen as a system—which means autonomy—becomes a subsystem, i.e., part of a larger system, this one rather self-contained. Historians, for example, often say that the slave system would have two poles, America or Brazil and Africa.<sup>11</sup> With the concept of commodity chain, such a “system” assumes the condition of a subsystem or part of the sugar commodity chain, which, in turn, is a component of the capitalist world-economy. To be sure, the commodities chains are much more than a component. Actually, they “may be thought of as the warp and woof of its system of social production” (Hopkins and Wallerstein 1994: 17).

To demonstrate that by the sixteenth century there was already a capitalist world-economy, Wallerstein and Hopkins start by asking the following question: “to what degree were production processes in different political jurisdictions and geographical areas integrated parts of a complex ‘world-scale’ division of labor, marked by phases of expansion and contraction?” (2000: 223). Our goal is much more modest. We want to show that the production and consumption of sugar have incorporated phases that were spread out across Brazil, Europe, Africa, and Asia. To achieve our goal, we will bring together and depict an overview of the upstream and downstream links of the sugar industry located in the Portuguese colony in South America. We believe that this overview will provide a good understanding of the relationships of activities that normally are viewed as separated.

The determination of the spatial and temporal changes of the sugar commodity chain during the period under study, both in terms

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<sup>11</sup> “It occurs that the exploitation of slavery agriculture assumed the command of the two poles of the system: the African ports and the American slave zones” (Alencastro 2000: 236). Statements such as this forget the fact that all production is useless if it is not sold. They also forget that one of the poles of the productive process of any commodity is its consumption. In the case of sugar, the slave-based agriculture had another pole in Europe, where the product was refined and consumed.



of location and the power relationships among the various components of the chain—for instance, between producers and traders—are matters that may be further examined in the continuation of this research.<sup>12</sup>

## THE SUGAR GLOBAL COMMODITY CHAIN

In this section we present the first results of our research and provide evidence that, in fact, the production and trade of sugar made up a global commodity chain. For this, we must show the spatial extent of inputs (instruments and equipment, raw materials, and workforce) connected to the product.

In order to do so, we first show the backward linkages, which were related with the purchase and use of the workforce of the enslaved African people. Next, we relate and identify the origin of the tools used in the several steps of sugar production: planting, harvesting, transportation of sugar cane, and manufacture<sup>13</sup> itself. In the last section, we address the matter of refining and trading sugar.

### *Linkages Generated by the Acquisition of Workforce*

During most of the sixteenth century, the workforce in the sugar production was Native Americans. Their replacement by African slave workers took over half a century, so that in the first decades of

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<sup>12</sup> Many of the theoretical and empirical possibilities of global commodity chains can be found in Gereffi and Korzeniewicz (1994) and also in Topik, Marichal and Frank (2006). The first book presents the seminal works of Wallerstein and Hopkins, in addition to a large number of studies on current commodity chains. The second focuses on the Latin American commodity chains, starting from the colonial period, and including three studies of Brazilian products: coffee, cocoa, and rubber. Sugar is studied, but only within the period from 1850 to 1950. Comerlatto and Lins (2008) apply the concept to the furniture industry of São Bento do Sul. As indicated by the subtitle "The Political Economy of the Coffee Commodity Chain," of his book, Talbot makes a broad study of the changes in the coffee commodity chain from the end of the Second World War to the first decade of the twenty-first century (2004). An updating of the theoretical debate on the commodity chain and its application to a great diversity of aspects can be found in Bair (2009).

<sup>13</sup> Gama (1983) and Antonil (1996) present in detail the labor process in a colonial "engenhos" or sugar mill.

the seventeenth century Africa was clearly established as the source of the slaves for the Portuguese-Brazilian sugar industry.<sup>14</sup>

When the Portuguese colonists supplied the labor demand by importing slaves from Africa, they turned the slave trade into the mainstay of sugar production and expanded the sugar commodity chain beyond Africa, to any place where equipment, goods, and people involved in the continuous acquisition of slave workers could be found. The Portuguese, but not only they, acquired captives in Africa by means of war and trade (Alencastro 2000) and gathered monetary resources, goods, and men from several parts of the world.<sup>15</sup> Thus, due to the specificities of activities necessary to enslavement on African soil, such as the transportation and daily reproduction in trading locations, in intermediary trade centers, and in the final destination, the slave trade has generated large market circuits in every part of the world. Therefore, it is almost impossible to overstate the economic, political, and cultural changes that the supply of slaves for sugar production has caused worldwide between the sixteenth and nineteenth centuries. Despite this undeniable greatness, the slave workforce was an input for the production of sugar, and all other activities—economic or otherwise—intended to supply such a workforce are fully inserted in the sugar commodity chain.<sup>16</sup> From this perspective, to use the same term employed by Alencastro, this workforce was an “ancillary commodity.” In short, all businesses it creates, or that are generated due to it, are ultimately a creation of a commodity to which it serves as a means, an input: *sugar*.

Throughout four centuries (1440–1850) when the slave trade flourished in the West associated with the production of sugar, there

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<sup>14</sup> For a discussion of the motivations and pace of the transition from the employment of native slaves to the employment of African slaves, see Schwartz (1988).

<sup>15</sup> Also according to Alencastro, “before leaving Europe,” João Rodrigues Coutinho, who acquired the *asiento* to smuggle slaves in Angola (where he also worked as a governor), “. . . ordered ships and ironware in Hamburg destined to Luanda. From River Plate basin and Panamá, where he lived out of doing business with slaves and cattle, he intended to bring 2500 horses to form cavalry reserves . . .” (2000: 80).

<sup>16</sup> The inclusion of the slave trade in the sugar commodity chain appears in the claims of the prosecutors of the State of Brazil (more precisely, Bahia, Pernambuco, and Rio de Janeiro) and of Angola against the sale of slaves to Spanish America by the Cape Verde and Cacheu Company, because such a sale “would increase the prices of slaves in Brazil, the decline of its agricultural production, the decline of shipping and customs revenues of the Kingdom” (Alencastro 2000: 329).

were changes (and even switches) of processes, agents that were external and internal to Africa,<sup>17</sup> the means (war, trade, etc.) places of origin and destination of enslaved people,<sup>18</sup> as well as the goods involved in the exchanges among enslavers, slave traders, and slave users. Here we will focus on commodities, agents, and regions involved in the slave trade for the Portuguese colony of America. In this regard, Alencastro draws attention to the following points (2000):

- (1) With the bartering of slaves, many other related African products were offered, which the slaves themselves transported in the way from their home villages to internal warehouses and ports.<sup>19</sup> Thus, the African inner region was linked to the global trade circuits, as, indeed, Alencastro noted.<sup>20</sup>
- (2) The counterpart of this offer was a variable (depending on the moment, the agents, and the geographical area), a greatly diversified demand of goods produced outside of Africa: European and Asian manufacturers and Brazilian products: zimbos, cassava flour, rum, tobacco, horses, corn flour, marmalade, dried and salted fish, cheese, and pottery dinnerware.

In the specific case of products coming from the American Portuguese colony, according to Alencastro, timber, tiles, masonry, and tools used to be exported to Luanda and Benguela.

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<sup>17</sup> For example, when the East India Company monopolized the slave trade to Brazil, the Portuguese continued controlling the acquisition of slaves in the countryside and their transport to the coast, and were forced to sell them to the Dutch. When in 1662 the Spanish Crown brought back the policy of *asientos*, the new *asientistas* (contractors) subcontracted the Company to provide the slaves (Puntoni 1999).

<sup>18</sup> From 1450 to 1550, slaves came from the region of Upper Guinea to the Portuguese Metropolis and Atlantic Islands; and thenceforth, from Central Africa to the New World (Alencastro 2000: 113). Regarding the captives taken to Bahia, according to Schwartz, "in the sixteenth century they came mostly from peoples of Senegambia, in the seventeenth century from the Congo and Angola, and in the eighteenth century from the Gold Coast and the Gulf of Benin" (1988: 282).

<sup>19</sup> These goods include: ivory, beeswax (in Brazil, widely used in candle making) leather, musk, copper, gold, flour, and palm oil (Alencastro 2000: 114).

<sup>20</sup> "All of these flows have made the long distance continental trade and maritime trade join the structures of village local consumption in West and Central Africa" (Alencastro 2000: 115).

Therefore, the sugar commodity chain spread worldwide. Let's take a close look at how this spatial articulation occurred. First the colony itself.

According to Alecanstro (2000: 361), from the late 1620s, Santos was already exporting wheat, sugar, provisions, raw cotton, woven cloths, and cast iron to the North of the Colony,<sup>21</sup> and to Angola. Therefore, a supply of regional products—with limited volume but varied types of commodities—was taken to the vicentino harbor.

Nevertheless, cassava flour seems to have been the main local product exchanged for slaves. According to the same author, "in the first quarter of the seventeenth century... the Brazilian bartering products—besides the smuggled Peruvian silver—was almost always cassava" (2000: 251), what leads the author to discuss a "cassava cycle," which peaked from 1590 to 1630. Produced in Rio de Janeiro and São Vicente and annually exported to Angola, the flour reached 680 tons, as estimated by this author, and was then sold for a value four times higher. Profits turned Rio de Janeiro farmers into *senhores de engenho*, what means, political and economically powerful people, which shows how local social changes are associated with or are a result of the advantages of integrating into a global commodity chain.

Some land owners produced flour to buy slaves. In Sergipe do Conde, a sugar cane mill located in Bahia, in 1607, its owner instructed the foreman to make sure they "produced as much flour as possible to exchange for slaves in Angola" (Ferlini 2003: 183). Alencastro has also found that "the Jesuits from Bahia exported cassava [or maybe flour?]<sup>22</sup> to missionaries in Angola in exchange for slaves" (2000: 91).

Acioli and Menz make the following observation regarding the relevance of flour in slave trade:

The importance of flour, in this period, may be justified by the growth and establishment of slave trade in Angola; unusual quantities of captives were heaped on the coast waiting

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<sup>21</sup> Lapa reports that the provisions for the ships from India which arrived in Salvador were often supplied by São Vicente, who used to send rice, flour, beans, and fruits (1968).

<sup>22</sup> Alencastro seems to use cassava and flour interchangeably. Thus (2000: 91), he states that part of the payment granted by the general government troops from Bahia was made with local flour. But (2000: 92), he writes that, "cassava started to be used to pay soldiers" in Africa, as well. As is well known, cassava is the tubercle from which the flour is made.



for shipment, exceeding the local food production capability. In addition, the importance of the flour trade in this decade was probably due to a supply decline in Angola from 1614 to 1617, caused by drought. Finally, a significant portion—perhaps  $\frac{1}{4}$ —of these foods were consumed in the trip, by the crew and slaves on board (2008: 50).

Another genuinely Brazilian commodity whose production was greatly stimulated when it was incorporated into the sugar commodity chain was cane spirit (*cachaça* in Brazilian Portuguese) distilled from sugarcane, which Brazilian traffickers began to exchange for slaves by 1650. It was so successful that the Portuguese Crown, following the recommendations of the Overseas Council, banned for ten years, starting from 1679, its import and consumption in Angola (Curto 2004).<sup>23</sup>

By 1690, groups interested in stopping the ban<sup>24</sup> argued that *cachaça* was the main commodity traded for slaves in the backlands of Congo and Dembos (Alencastro 2000: 319). Curto states that, while providing a much desired product, Brazilian traffickers lacked European and Asian woven fabric, who were the most desired items in Central Africa, and which the Portuguese traffickers had offered since they started the slave trade in Angola (2004). According to Curto (2004:98), in the 1760s, between 27 and 40.5% of the 82,911 slaves deported from Luanda were exchanged for *cachaça*. When comparing the prices and volumes of *cachaça* exported to Angola to the prices of slaves, Acioli and Menz concluded that the drink was only worth "579 slaves on the coast of Africa, equivalent to about 13% of the total exported from Angola (estimated at 4,619 slaves annually). *The remaining slaves were exchanged for Asian and European products*" (2008: 52, emphasis added).

Despite the controversy, the *cachaça* was largely exchanged for slaves, which stimulated its production, benefiting everyone involved in its commodity chain: land owners, cane growers, blacksmiths, coppersmiths, potters, transporters, merchants, and tax authorities. Thus, it stimulated the "local economy." Regarding the spatial origin

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<sup>23</sup> Ferreira (2001) even claims that the greatest accomplishment associated with this distilled drink was to transfer the control of slave trade to Brazilian merchants.

<sup>24</sup> But the "local spirit" kept coming to Africa, smuggled, including by senior officials, such as the Governor of Angola, João da Silva e Souza from 1680–84 (Alencastro 2000).

of *cachaça*, since it was associated with cane mills, in the late decades of the seventeenth century, Bahia exported 61%, Pernambuco 26%, and Rio de Janeiro 12.5%, a percentage that increased in the following century, reaching 53% of the total supply landed in Luanda in 1760. Meanwhile the port of Rio received 43.5% of the slaves shipped from Luanda (Ferreira 2001: 349–50). Ferreira reports the following equivalence in exchanges of the inner regions in Angola, more precisely, at the Kassanje fair: seven liters of *cachaça* = one excellent slave = five excellent Portuguese gunfires = fifteen units of Asian woven fabric.<sup>25</sup>

The third colonial commodity that was inserted in the sugar commodity chain when used for the purchase of slaves was tobacco, which from 1675 onwards was the main product in the bilateral trade between Bahia and the Gulf of Guinea (Alencastro 2000: 323), but which, according to Curto (2004), was not relevant in the traffic with Angola. Similarly, Ferreira affirms that by knowing how to take advantage of tobacco, merchants from Bahia could control slave trade coming from that African region (2001). Alpern explains that people from Bahia used molasses to prevent tobacco leaves from getting too dry (1995: 26). That gave tobacco a special flavor that delighted African citizens from “the Gold Coast and especially from the Slave Coast, where the Brazilian tobacco became the most desired commodity after shells,” (1995: 26) forcing the British, French, and Dutch to buy from the Portuguese. Although they acknowledge the strength of tobacco, Acioli and Menz believe its power in the exchange for slaves is somewhat relative (2008: 59). They argue that despite the fact that the cargo manifests of ships leaving the capital of Brazil or the port of Recife declare only rolls of tobacco in their records, some testimonies from that same period attested that it was not possible to acquire slaves by paying only with the third rate tobacco (the only one permitted by the Royalty on that route).

These authors present documents that list the products carried by a ship that left from Recife towards the Gold Coast, which includes the following commodities: *cachaça*, sugar, wrought and powdered gold, tanned and furred jaguar leather, hammocks, silk sun hats, ox

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<sup>25</sup> The unit is the *kizambo*, which in the Kimbundo language means the amount of woven fabric required to dress a person (Ferreira 2001: 350).

tails, knives tipped with turtle cable, white European and Indian woven fabrics, and . . . some silk.<sup>26</sup>

Finally, it should be noted that in the eighteenth century jerked beef appears in greater quantity among foods produced in Brazil, partly at the initiative of the General Company of Grão Pará and Maranhão that imported it from Brazil along with other foods that were stored in the African boarding ports, where the forced migrants were gathered and remained for days (Alencastro 2000: 254).<sup>27</sup>

This brief description of colonial goods exchanged for slaves shows how much these products were linked to sugar—the commodity at the center of this real net of chains—and which functioned as the driver of local economic activities. Although incipient, these connections may be a good hint to researchers that, according to Schwartz (1992), still need to be conducted on the relationship of production for local and foreign markets. Moreover, his hypothesis is that “historically, agriculture for export and for local consumption was intimately related in a complex, multidimensional and historically changeable manner” (Schwartz 1992: 66).

But the backward linkages which resulted from the need to withdraw thousands of human beings from their communities and send them to the Portuguese colony extended to Europe and Asia. The evidence of these linkages will be shown below.

## ASIA

An indirect way of connecting the American Portuguese colony with the East was to supply ships on the Lisbon-India route. Lapa shows that since the sixteenth century Salvador was an important stopover port for Indian naus, ships that took the route from Portugal to the trading posts in Goa, Diu, and Daman (1968). This mediation was in fact so relevant that in 1565 the Portuguese Royalty tried to prohibit it from continuing, but it was not interrupted. In the seventeenth century other permits were issued for the same purpose, and in 1672 the trade was finally accepted. Lapa highlights the importance of this measure:

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<sup>26</sup> General Information from the Captaincy of Pernambuco [1749]. *Annaes da Bibliotheca Nacional do Rio de Janeiro*, v. XXVIII (1906: 482–83); Acioli e Menz (2008: 59).

<sup>27</sup> Alencastro notes that on a second stage, cassava and corn started to be cultivated in Africa, further stimulating enslavement in that territory.

In the seventeenth century even the slave trade, particularly from Angola to Bahia, started to count with the ships of the East route, which took African human cargo destined to Brazil, where they collected tobacco, both for African and Asian ports. There was thus, through the Portuguese domains, a *commercial articulation among the three continents*, which was hindered while the scale in Salvador was suspended (1968: 255, emphasis added).

The decline in exports to the East was well-compensated by goods brought in and taken from Salvador, which started to re-export Asian products around the South Atlantic. Woven fabrics were sent from Salvador directly to Luanda (or through the traffickers in Recife and Rio de Janeiro). The function of warehousing extended to the point that no ship left Portugal to Goa in 1768 (Lapa 1968). The woven fabrics were used by all who wished to purchase slaves, and that is the reason why the Dutch also used them in their operations in the Loango Coast (Ferreira 2001). Based on the records of some East India Company<sup>28</sup> ships during the seventeenth century, Postma notes that textiles products were dominant (1990), most of them manufactured by the Dutch, and there were also exotic Asian items, greatly appreciated in the African market. As for the Middelburgsche Commercie Compagnie ships, textiles accounted for 57% of products and 50% of these woven fabrics came from Asia. The presence of Asian woven fabrics increased throughout the century, which means a relative decline of European counterparts. The author also notes that the woven fabrics were mostly traded with the Loango Coast rather than with the Guinea Coast.

Ferreira also states that 90% of cotton woven fabrics (2001: 356), coming from Portugal to Brazil, were manufactured in Asia. Lapa notes the existence of “some kind of Brazil-Africa-Asia triangular trade, without much interference from Portugal, and with variations such as Asia-Brazil-Spanish America” (1968: 277). In this route, the load came from the East to Angola where it was brought to Brazil along with the slaves. This “trade scheme” (Lapa 1968) was banned by a Crown order from June 19, 1772, which tried to prevent direct transactions between colonies.

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<sup>28</sup> Since its foundation in 1621, until 1730, this company had the monopoly of the slave trade (Postma 1990: 17).



To sum up, we may conclude that along with *cachaça* and firearms, woven fabrics were a key component among the goods exchanged for slaves. "They were so much associated with slave trade that they became known as *black woven fabrics*" (Ferreira 2001: 351). Ferreira himself shows the spatial extent of the sugar commodity chain, when he finds that "under the command of dealers in Brazil, *the Asian woven fabrics trade interconnected different areas of the Portuguese Empire—Brazil, Africa and Asia*" (Ferreira 2001: 345, emphasis added).

## EUROPE

Although, according to Postma (1990), since 1593 there was a regular trade between the United Provinces and the West African coast, and in 1612 the first trading post was installed on the Gold Coast. At this stage the Dutch sought gold, not slaves. It was after the West India Company (WIC) occupied Recife in 1630<sup>29</sup> that the Dutch realized that sugar production depended on slave labor. To ensure the supply of African workforce, the WIC became directly involved in the trade, and such involvement led it to conquer the fort of São Jorge da Mina in Guinea (Puntoni 1999: 102). Based on documents from the General Overseas archives, Ferreira states that, in the late decades of the eighteenth century, Dutch control was so strong in the Gold Coast that in order to trade slaves in that region the merchants from Bahia were required to pay a 10% fee over the value of the goods that would be exchanged for slaves (2001: 367).<sup>30</sup> As a result of this practice, the Dutch "became the distributors of the main goods of the Gold Coast trade—Brazilian sugar and tobacco, in addition to gold, which was illegally used by Brazilian merchants to buy slaves" (Ferreira 2001: 368).

The British entered the slave trade in the second half of the eighteenth century and the French towards the end of the century.

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<sup>29</sup> This occupation, which was a measure of Dutch strength to regain the position they had lost in the sugar commodity chain since Spain dominated Portugal in 1580, is seen by Postma as a logical unfolding of the Dutch involvement (1990), since the end of the sixteenth century, in the sugar production in Brazil. The occupation also shows how much the commodity chain is immersed in geopolitical context.

<sup>30</sup> To avoid this extraordinary cost, traders from Bahia appealed to British protection and used their flags to sail. Ferreira does not refer to the cost of such protection.

On a smaller scale, Danes, Swedes, and Germans also entered this business (Postma 1990: 26).

In the second half of the eighteenth century, the English joined the Dutch and built “the greatest slavery business of the eighteenth century” (Acioli and Menz 2008: 57), allying with the Spaniards to buy slaves in Africa and sell them to Spanish America.<sup>31</sup> This increased presence of traffickers in northern Europe is reflected in the types of commodities brought to Africa in exchange for slaves. Table 1 shows that in the late decades of the eighteenth century, European and Asian products dominated the market.

**Table 1**  
Origin of Goods Imported by Luanda

	1785–97	1795–97	1798–99	1802–03	1808–09
Europe	44%	41%	40%	49%	33%
Brazil	22%	31%	18%	16%	28%
Asia	34%	28%	42%	35%	39%

Source: Acioli and Menz (2008: 54).

Thus, from 1785 to 1809, European goods had the greatest importance in seventeen years, against four years of Asian products. Brazilian products had the lowest participation in all years, overcoming the Asians in only three years. Regarding composition, the “Portuguese and English textiles, and the ironware and weaponry from northwestern Europe” stood out (Acioli and Menz 2008: 54). Since Portuguese and Brazilian traffickers competed against other European traffickers, they had to offer the products that the slave suppliers most wanted. As mentioned, Asia brought woven fabrics, while Western Europe provided wool textiles, weapons, and metal utensils. The largest slave trader of the eighteenth century was British and got his textiles through the *East India Company* and from European sources as well. However, the share of imported manufactures in the British re-exports to the Atlantic Africa declined steadily since the mid-seventeenth century. First in woolen products

<sup>31</sup> “The partnership started in 1752 and foresaw sending 3000 slaves triennially to Buenos Aires.” The British took the slaves to the island of São Tomé, which belonged to Portugal. Spanish ships were in charge to make them reach their final destination (Ferreira 2001: 371).

and, increasingly, in cotton products and weapons, Britain started to use internal sources of manufactured goods, gradually replacing imports and re-exports throughout the century (Acioli and Menz 2008: 57).

In addition to this direct participation, European goods were brought to Africa by Brazilian traffickers, because it was not possible to acquire slaves without offering European and Asian goods.

*Spatial Linkages due to the Origin of the Instruments and Equipment used in the Several Phases of the Production Process*

This subsection describes and identifies the origin of tools and equipment used in the several phases into which sugar production can be divided: planting, harvesting, transportation of sugar cane, its transformation in sugar, and transportation to the port. This research is based mainly on André João Antonil, who at the turn of the seventeenth century observed and described the production of sugarcane—from planting to packaging—as it occurred in one specific sugar cane mill, Sergipe do Conde.<sup>32</sup> Antonil's interest in the work process—labor force, labor means, and labor object—and the relationship among them is comparable to Marx's in Book I of *Capital*. Such interest is extraordinary at a time when labor, that is, physical effort, lacked the social prestige of Marx's time period.

PLANTING, HARVESTING, AND TRANSPORTATION OF  
SUGARCANE TO THE SUGAR MILL

The planting activities in the lands of the mill owners or in the properties of "sugarcane farmers" were conducted by slave laborers, who basically used axes, sickles, and hoes (to cut trees and clear the land) and machetes—or sickles, in Antonil's description—to cut sugarcane. Made of iron, these tools were imported. After it has been cut, sugarcane was transported to the mill on boats or bullock carts, which were manufactured using local wood and imported nails and tools as well. Sail woven fabrics and the tar used to seal the boats were both imported.

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<sup>32</sup> For more detail on this mill, see Appendix A in Schwartz (1988).

## SUGAR MANUFACTURING, PACKAGING, AND SHIPPING (TO THE PORT)

When describing the facilities and equipment of the Sergipe do Conde mill, Antonil mentions the use of iron plates (for coating), parts (rings, pins) and components (1982). The mill rolls that squeezed sugarcane were also coated with iron plates. Sugarcane juice was deposited on a container, "where it is lifted with two cauldrons or hubs, with wheel, axle and chains, and goes to *another container*" (Antonil 1982: 41, italics in the original).

When preparing the "decoada," which was water prepared with ash to help purify the juice, iron rakes and shovels were used, as well as two large pots, probably made of iron or copper.

Antonil uses the expression "copper order" to refer to the set of equipment:

[beyond the container for the juice and the lifting container, which are kept in the crushing house] two boilers (...) one for the scum, a big one (...) and a smaller one (...), a set of tacks, which are four: one of receiving, one at the door, one for cooking, one for beating, and finally, a bowl, to sort sugar in the forms. And (...) other copper utensils of equal or slightly smaller relevance (Antonil 1982: 44).

The author observed one set in use and another to be repaired and estimates that the Sergipe do Conde mill consumed a total of 175 *arrobas* or 2475 kilos of copper in these utensils.

Is far from being small the variety of instruments used in the boilers:

skimmers, *pombas* (which are concave copper vases, with a long wooden stick—about twelve or fifteen palms) barrels, hubs, adapters (made of copper, such as a smaller *pomba*), parters, pots, small vases, mixers (similar to the skimmer, but with beak and no holes) spouts, diggers, spatulas and shredder (Antonil 1982: 46).

In the purging or curing house—where sugar was purified and bleached—sugar was stored in large bell-shaped clay forms with holes at the narrowest side and "periodically covered with moistened clay. The water in the clay then percolated through the forms of crystallizing sugar, further draining impurities and producing a form



in which white sugar predominated"<sup>33</sup> (Schwartz 2004: 179). These forms were manufactured in the mill house or at some local pottery house. In the purging house the following instruments are used:

iron perfurator (...), diggers also made of iron (...) and mallets to make adobe walls. (...) machetes and hatchets to make brown sugar, and oarlocks to break the brown sugar. On the drying counter are used machetes, oarlocks, and squeegees, and breaking stick with four backsides to break sugar loaves (Antonil 1982: 50).

The fuel used to cook the juice and turn it into molasses was wood, which "supply (...) for the furnaces was as important as cane to the mill" (Schwartz 1988: 190); and the first findings of its scarcity was recorded in 1660. For the process of cutting the sugarcane, sickle and axes are used, and for transportation, boats or bullock carts. According to Schwartz, to process eighteen loads of sugarcane, eight loads of firewood were consumed (1988: 110).

In Sergipe do Conde, every year 2,200 meters of woven fabrics were imported for sails and tar was applied twice a year in the boats. Fifty-five meters of tent cloth were required to dry the sugar, which also consumed 220 meters of filter (Mauro 1997: 281 and following).

In the same mill, Antonil found "large scales and two-arroba or less heavy weights" (1982: 53).

Sugar was packed in boxes made with wood boards that had "already been sawn in the sawmill" (Antonil 1982: 43). In the manufacture of boxes they used "drill, hammer and nails and frames or supports (...) To build a box eighty-six nails are needed" and, once closed, they had to use "a heated iron or ink" to stamp the box's weight, type of sugar, and the initials of both the mill and the buyer (1982: 54).

Also according to Antonil (1982: 55), from mills located near the beach, the boxes were taken to the port in specific small carts which were pulled by slaves. As for the mills located distantly from the port, sugar was brought in carts pulled by three or four oxen.

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<sup>33</sup> Using clay as a purifier, considering that we all think it is dirty, is still impressive for Antonil: "Clay is not admired, its nature is considered filthy, although it was an instrument used to cleanse sugar in its purging process. Just as clay, tears purify and clean our souls, which were filthy" (Antonil 1982: 52).

Besides these threads required by the inputs, the mill house, as noted by Ferlini (2003: 136), required other support services such as carpentry, joinery, flour mills, and livestock for slaughter and transportation. Carpentry, sawmill, and woodworking required at least “the most usual instruments, namely, saws, augers, drills, compasses, rules, chisels, adzes, gouge, axes, hammers, canteens and binders, nails and planers” (Antonil 1982: 24).

Celso Furtado states that one of the consequences of sugar production in the Atlantic Islands was the emergence, in Portugal, of an industry to produce equipment for sugar mills (1995). All of the mills were probably brought from there and installed in the colony until the settlers had at their disposal the workforce, tools, and materials needed to manufacture the components of a mill, but we don’t know when this condition was reached.

Finally, two annotations for further study on this matter. Without specifying the date, Gama states that the colony already had “imported horizontal mills” (1983: 296). Fragoso, however, through the balance of trade from 1796 to 1811, concluded that a *plantation* used to import “machines, iron and pitch” (1998: 100). It is reasonable to assume that, except for machinery, this also occurred in previous centuries.

### *Shipping to Europe, Refining, and Consumption*

By definition, the commodity chain of every product begins with the production of inputs (raw materials, equipment, labor, etc.) and ends with consumption. In the case of sugar, one of the most important activities was the transportation from the colony to Europe, where it would be refined and consumed.

At this stage of our research, we have little to say about transportation. We will only remember that, under the colonial monopoly, all sugar produced in the colony had to be taken to Portugal and then re-exported in Portuguese ships, when possible. This was imposed by a decree dated Nov. 3, 1571. As the Portuguese Crown never had the means to enforce this law, the sugar was transported in ships belonging to merchants of various nationalities (Genoese, German from Lübeck or Hamburg, English, Dutch), authorized or not, as it occurred with smuggling, often practiced by the French, Dutch, and English (Mauro 1997).

According to Postma, "around 1622, the Dutch shipyards were building fifteen ships annually solely for the trade with Brazil" (1990: 14). The position of Lisbon as a re-exporter hub and of northern traders as transporters came from the previous century, because the "the Madeira sugar (. . .), was often transported by Netherlands ships" (Harreld 2003: 151). In summary, let us consider that the sugar was transported by European ships and crews.

On refining, although we have not yet consulted any specific and specialized study on this topic, we seek to advance by gathering information from various sources, according to which the sugar refining of the Portuguese colony was conducted in Northern Europe. The study of the causes and consequences of this labor division between Portugal and its customers does not fit the scope of this article. For now, it is enough to know that since the fourteenth century the interests of Genoese and Venetians capitalists were key for the division of labor between town and countryside to be adopted in the sugar commodity chain:

The manufacture of sugar was divided, in Italy from the fourteenth century, into two sections—one is the rural manufacturing, spread out in a large number of small units, the other is the manufacture of refining, with a smaller number of units installed in cities and linked to major national and international trade markets (Gama 1983: 322).

This separation between manufacturing and refining provides "the control of quantity and quality of the final product and thus, in large part, of its value" (Gama 1983: 317). Galloway notes that "after about 1470, European importers began to build refineries, first in Venice and Bologna, then in Antwerp, and during the sixteenth and seventeenth century in many northern cities, where they converted crude crystal sugar into superior grades" (1980: 40). As from the beginning the manufacture of sugar in the Portuguese American colony would be held according to expertise, managerial, and commercial knowledge and criteria from that period, the spatial division of labor which prohibited refining for the colony, was "naturally" applied, however no longer under the preeminence of Italians:

From the mid-sixteenth century, precisely in the opening of the sugar cycle, there is a clear identification of common interests between Portuguese and Flemish, which would henceforth increase.

*The Portuguese were in charge of the production, the Flemish collected the raw product in Lisbon, refined it and distributed in Europe, especially for the Baltic, France and England* (Deer, 1949/1950 apud Gama 1983: 312, emphasis added).

As we have seen in the observation of Galloway, this relationship began in the fifteenth century and remained as late as the end of the sixteenth century, when Amsterdam replaced Antwerp. Gama emphasizes the political and economic hierarchy between Portugal and the Netherlands:

Since the sixteenth century, however, the Dutch refineries processed Brazilian product that passed through Portugal in its way to Antwerp and later Amsterdam. (...) On this side, exporting the well-finished product would be more interesting, due to its greater value. On the metropolitan side—the Netherlands was the indirect metropolis of the Brazilian sugar economy—thus, to import raw sugar would be more interesting. The closer to the natural product, the raw material, the more convenient it would be (Gama 1983: 23).

Of course refiners were fully interested in the continuous flow of raw materials towards their factories. Based on Stols (1973), Puntoni reports that the annexation of Portugal by Spain in 1580 “at first did not threaten the position of an elite group of merchants involved in this kind of deal” and that “the Dutch controlled almost the entire refining industry and therefore struggled to achieve the same position with trading” (1999). In fact, the author continues, “Amsterdam would succeed Antwerp on the primacy of trade and refining of sugar.” The chronology of such transition is as follows: in 1585 the first refinery is built in Amsterdam. In 1594, there were 3. In 1620, there were 25. In 1621, there were 29 (25 in Amsterdam, 2 in Middelburg, 1 in Delft and 1 in Wormer) (Puntoni 1999: 32). According to Schwartz, in the same city there were 50 sugar refining plants in 1650 and 110 in 1770 (1988: 146). In England, the first refinery was installed in 1544, but the industry only acquired significance in the second half of the seventeenth century, when the State, after 1650, took measures to drive colonial products to the metropolis, including raw sugar refined in England. Sheridan says that the Navigation Act from 1660, with regard to sugar, “was intended to swell the profits of the middlemen, encourage home refiners and increase freight and customs revenues” (1973: 42). The mercantilist policies seemed to



have worked, because in 1695, there were 30 active refineries, and around 1753, 120 were active, including 80 in London, 20 in Bristol, and 20 in Scotland. It was said that this industry directly involved 1800 workers (Sheridan 1973: 29–30).

The control over refining allowed the Dutch and the English to develop techniques that were later transferred to manufacturing, which in turn put them at the forefront of technological development in sugar production (Gama 1983), a privileged position in the commodity chain of sugar.

The decision on reserving to the colony the role of producer of sugarcane and lower quality sugar brought immediate benefits to the Portuguese Crown and to all that in the colony had businesses inserted in the sugar commodity chain.<sup>34</sup> Nonetheless, later, when the conditions of the world market changed, with increasing preference for refined sugar, the inconveniences of such a peripheral position became evident, as well as the imperiousness of transiting to the most profitable positions in the chain. According to Gama, in 1687, João Peixoto Viegas suggested to the King that to combat the decline of sugar revenue, that sugar should be refined in the Colony (1983: 314). Viegas claimed that this initiative would raise the Crown revenues and attract businessmen and skilled workers, who would develop the refining industry<sup>35</sup> in the Colony.

However, by that time Portugal no longer had the strength to change its position in the international division of labor, and was being pushed increasingly to the periphery of the world-system.

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<sup>34</sup> "Brazil specialized in producing the white sugar that was more highly valued than *muscovado*, but which also eliminated the need for further refining. Thus its metropole, Portugal, unlike Holland and England, did not develop a refining industry until the eighteenth century" (Schwartz 2004: 179). Besides this technical reason, the absence of a refining industry was reinforced in 1557 by a royal order that gave to São Tomé the monopoly of refining for a 25-year period. This measure was taken because, according to the authorities, refining would consume wood that was necessary for ship building (Mauro 1997: 313).

<sup>35</sup> "The refining of sugar remains in the midst of a mystery, a secret craft, semi al-chemical (the procedures are jealously guarded mysteries) until the mid-eighteenth century, when it came to light" *L'art de raffiner le sucre*, the first work on refining technology, written by Duhamel Dumonceau (Gama 1983: 247). In Brazil, in the book *Novo methodo de fazer o açúcar* published in 1816 in Salvador, Manuel Jacinto de Mello Sampaio proposed a method of refining (Gama 1983: 295).

As there was no response to competition from advanced Antillean production already “tied to the new European refining industry”<sup>36</sup> Brazilian farmers responded by increasing the export of even less elaborated products. This is how Gama interprets the Bahia export of 10,500 kilograms of molasses in 1775 (1983).

After this brief exposition of refining, we can now move to the final stage of the commodity chain of sugar.

As our objective is to locate consumption geographically, we have no need to study final consumption. Therefore, we limit ourselves to pointing out the main destinations of Portuguese-Brazilian sugar.

We can say that, outside of local consumption, all sugar of the American colony was exported to Europe, as was the case with the production of other Portuguese domains. Noting that there are no precise figures for the sixteenth century, Harreld estimates that by 1560 Portugal was importing, annually, about 5,000 tons of sugar, while in the 1570s the average annual import volume would have fallen to 3,300 tons (2003). Through German and Dutch merchants in Antwerp, “large quantities of sugar were dispatched to Atlantic trade centers like Nuremberg, Frankfurt and Cologne and even more distant sites as Leipzig” (Harreld 2003: 154), the latter being the port city from where sugar was sent to markets in eastern Europe.

Therefore, via Antwerp, sugar produced in the Atlantic Portuguese domains reached the center, north, and east of Europe. Additionally, Madeira sugar was also exported to Venice, Chios, Constantinople, Genoa, and London (Godinho 1983: 84). We must not forget that the metropolis itself was also consuming this product. This pattern did not change in the second half of the sixteenth century, when the Portuguese colony in America became the leading supplier of sugar to Antwerp.

Ferlini reports that in 1654, the mills located between São Roque Cape and Bahia were responsible by 75% of the 1,200,222 arrobas produced annually in Brazil and that this region supplied the European market demand, which thus received at least 75% of sugar produced in the Portuguese Colony (2003). Based on re-export data of port customs, because the Lisbon data was destroyed by an earthquake in 1755, Costa states that in the decades of 1640 and 1650

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<sup>36</sup> Gama accepts the information that the first refinery in the Brazilian territory would have been installed in Santos in the second decade of the nineteenth century (1983).

"England became the main market, consuming more than 40% of the re-exported sugar," which may be due to lack of data of re-exports to Italy, probably from Porto (2004: 6). Although it was the largest market in Europe, from 1660, the UK was increasingly importing from its colonies. At the end of the seventeenth century, when coffee houses scattered in London, sugar became necessary to adapt coffee, tea, and chocolate to the taste of the English, and accompanying these products, sugar consumption *per capita* rose from about two pounds in 1660 to about twenty in 1795 (Ashworth 2003: 231). Sheridan states that between 1663 and 1775 consumption increased 20 times in England and Wales (1973: 21). Still according to Sheridan, "little is known of consumption patterns in other parts of Europe, but it seems that, like France, these countries tended to lag behind Britain" (1973: 25). Nevertheless, France was an important market, but so was Germany. And as England and France increased imports from its colonies, Portugal had to seek other markets, but also in Europe, where demand could continue to grow long, because in 1783 only half of Europe knew this product (Braudel 1995: 200).

As for the consumption in the Colony itself, according to Antonil, in the late seventeenth century only 2.2% of sugar production "stayed in the land (...) to be consumed by it" (1982: 56). Although population growth and economic diversification caused by mining in the eighteenth century have increased the percentage of not exported production, Europe, including therein the metropolis, remained the main destination of Brazilian production at least until a good part of the nineteenth century.

### *Draft of the Sugar Commodity Chain*

Respectively, Özveren (1994) and Pellizon (1994) reconstituted the wheat and shipbuilding commodity chains in the period 1590–1790, in order to examine the social complexity, scope, and spatial changes of these chains. Our reconstruction of the sugar commodity chain as shown in Figure 1, is intended only to illustrate the geographical wideness of this chain through the identification and spatial location of the main processes that comprise it. Thus, although it contains the name of a product, each box in the figure represents a chain manufacturing process. In the center of the scheme, we highlight the stages of the production process itself occurring in the Colony (planting, transport and transformation of sugarcane, boxing

and transporting of sugar to the port), as well as transportation to Europe, where refining and consumption took place. Above this axis, we have inserted the inputs that are required for the previous activities to be carried out. By performing this integration, we realize that certain inputs such as tools, are a *sine qua non* condition for the operation of a mill, although, unlike the boilers, they do not appear as such. In fact, although not the same, tools are needed to cut the wood and turn it into furniture, houses, water wheels, shafts, mills, tables, boats, and bullock carts, and also to process and pack sugar. It is for this reason that they appear so frequently in Figure 1. Because they were made of iron, these tools were imported.

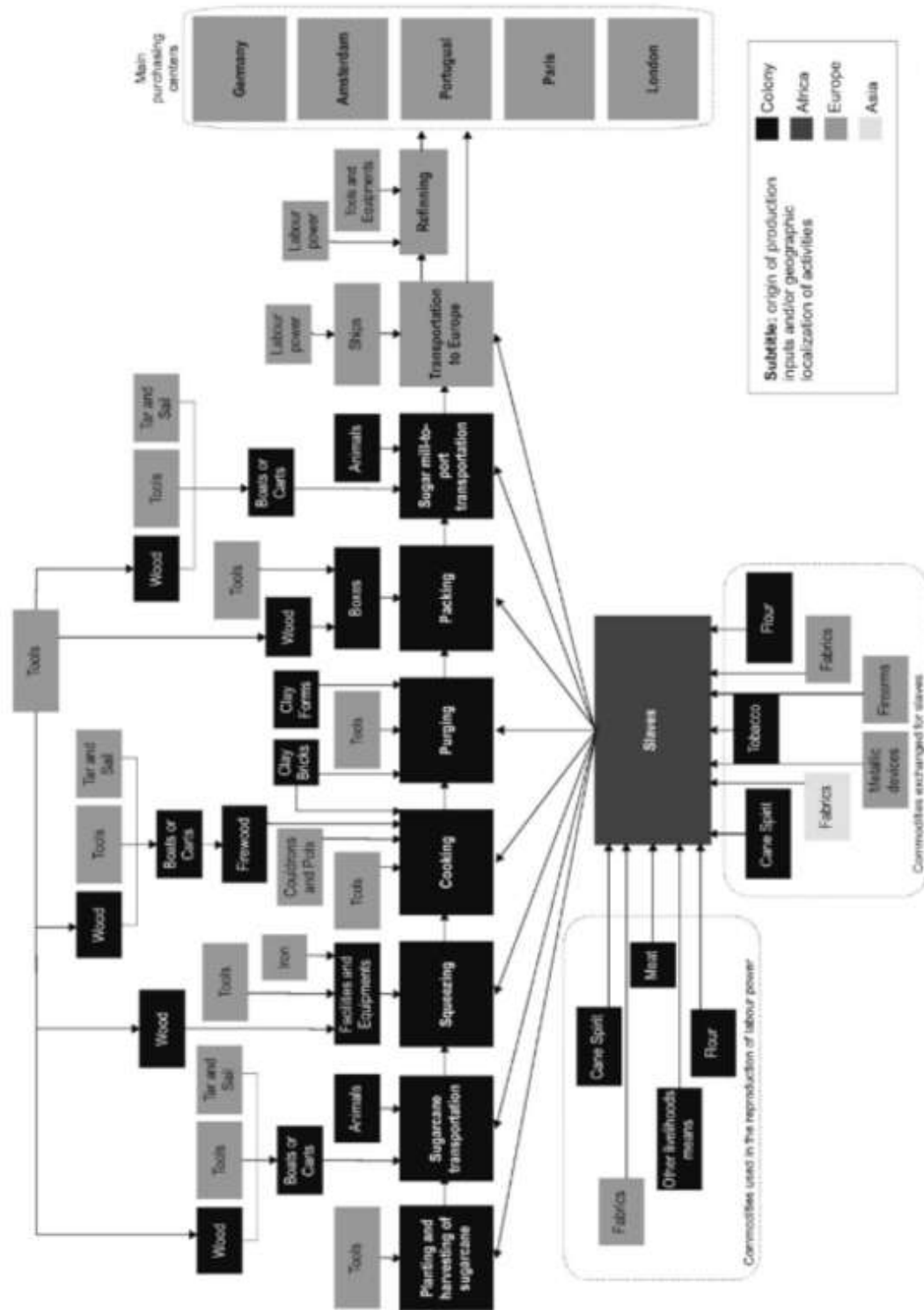
At the bottom of Figure 1 we intend to show the processes related to the provision of workforce. Below the "slaves" box, we listed the goods used to get the captive workers; and to its left, the goods that ensured their livelihood in the Colony. We must keep in mind that the production of each of these goods demands inputs and workforce that will constitute others chains, increasing even more the size of the sugar commodity chain.

## CONCLUSION

This article, through the territorial extent of the sugar commodity chain, attempts to build a bridge between, on one side, the accounts of the modern world-system development carried out by Wallerstein (1999) and Arrighi (1996), which deliberately do not "turn down" to the regional and/or local processes, and, on the other side, the line of interpretation of the Brazilian economic history developed by Celso Furtado, Caio Prado Júnior, and lately by Fernando Novais. Although these authors do not come to isolate the regional and local processes, they do not see these processes as systemic manifestations, or rather, they do not bother to show the links among the major systemic processes and internal processes to *terra brasiliis*.



**Figure 1**  
Sugar Commodity Chain



By the author with support of Fabio Padua dos Santos.

Source: the author with support of Fabio Padua dos Santos

Through the concept of commodity chain it can be noted that the activities involved in the production, trading, and consumption of sugar were spread across the Americas, Europe, Africa, and Asia, forming a true business network with many connections, among which we can highlight:

- (1) America (Colony) ↔ Europe: The relationship between these two regions is so strong and necessary that one could also say that the commodity chain begins and ends in Europe, because: a) from there comes the initial impetus for the installation of agribusiness and many of the tools and equipment necessary to the various work processes, as well as food, textiles, and weapons to barter in Africa; b) there is located the final stage of the transformation process—refining—and c) it is to there that the bulk (if not all) of production is directed.
- (2) America (colony) ↔ Africa: The workforce, which along with the means of production are the elements of any work process, came from Africa. To take from their communities, collect, maintain, and transport about 4,029,800 men, women, and children estimated to have landed in the colony between 1551 and 1860 (Alencastro 2000: 69), it took men, equipment (ships and weapons, etc.), facilities (for shelter), and commodities (for bartering and maintenance in transit) in monumental amounts and these came from all over the world, including the Colony itself, where local products came from (cassava flour, spirit, and tobacco, among others) and imported products (woven fabrics, tools, and weapons).
- (3) America ↔ Africa ↔ Asia: Colonial products, such as tobacco were exchanged for woven fabrics in Asia, which were among the items exchanged for slaves.

Besides this external dimension relative to the Colony's territory, the sugar commodity chain branched within the colonial territory through the production of raw materials, firewood, equipment, and several types of inputs necessary to produce, pack, and transport sugar. Initially small, this internal dimension was most likely growing as the technical and human capacity installed in the Colony widened both in agriculture and in manufacturing. For the first mills, technicians, equipment, some food, and woven fabrics were necessarily

brought from Europe. But later it was possible to find local substitutes. To meet the demands of the sugar industry this "local offer or production," which Fragoso and Florentino (2001) show to be thriving in the second half of the eighteenth century, became an inseparable part of the worldwide sugar commodity chain. For food, as we saw, there was always a local supply.

In this first approach, the backward connections caused by the production process are not shown in detail. Nevertheless, the description of this process is enough to give an idea of the quantity and variety of facilities, equipment, and tools used in a sugar mill. Because it is difficult precisely to determine which materials were used, the places where they came from remain mostly unknown. However, there is strong evidence of copper in cooking, and iron to cover part of the mills, as well as large skimmers, axes, sickles, hoes, hammers, saws, scythes, nails, that is, a large amount of iron-made material which shows that the sugar manufacture chain stretched backwards to Europe. Most frequently, copper stands out in the literature. Mauro states that in Madeira Island, back in 1611, the war had hindered the importation of Dutch cauldrons, which bottoms were remade at each year, consuming about 136 kg of this metal (Mauro 1997: 281).

Finally, a word on the relevance of consumption. Since Marx, there has been a strong tendency to push production—where value is produced—to the top of the process of capital accumulation, at the expense of consumption, almost always regarded as a "passive" step in this process. A more comprehensive approach, such as that provided by the global commodity chains, will show that consumption is also a source of innovation and change that impacts production. In fact, sugar increasingly became a popular item of consumption when, in the eighteenth century, it began to be used in the manufacture of alcoholic beverages, desserts, and sweets, and also to make tea, coffee, and chocolate more pleasant. This popularization allowed production and dissemination to grow in several parts of the Americas (but not only in them), which in turn increased competition, decreased prices, and extended even further the range of consumers. Such changes, which can be seen as economic development indicators, as well as the spread of the refining industry, occurred in those "countries then thriving economically, which had important capital resources, *skilled and free labor*, that is, countries

already on the road to development" (Malowist, 1969: 29 apud Wallerstein, 1974: 121 emphasis added).

The commodity chain changes that occurred in the period studied, as well as its economic, political, social, and cultural causes and consequences are part of a continuing research program for the coming years.

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