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Spanish America from an International Comparative Perspective

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Abstract

This paper offers new quantitative evidence on living standards in Bourbon America through the study of wages and heights. Neither were wages low nor were heights short by the international standards of the period. Thus, living standards of the Spanish Americans compare favourably with those of other regions of the world, including Europe. As in many parts of the West, a trend towards deterioration of real wages is observed in Spanish America at the end of the period. Our findings suggest that the Great Divergence in living standards between Spanish America and the developed Western countries might have taken place mainly after the Independence.

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Introduction

The scholarly interest in real wages of the past has recently revived. The current revival owes a lot to the research agenda established by Van Zanden and Allen.² It has been reinforced by significant contributions from a number of scholars.³ A common feature of this literature is the adoption of a long-term international comparative perspective. The inclusion of major Asian countries among the cases studied by this scholarship has been stimulated by the debate on the Great Divergence between East and West.⁴

However, curiously enough, Spanish America has not yet a presence in the global picture of real wages, or in the Great Divergence debate, in accordance with its historical relevance.⁵ Hence, the main goal of this paper is to contribute to the opening of the black box represented by living standards in Bourbon America. Thus, we study wages over the eighteenth and early nineteenth centuries. In contrast to a long tradition among many latinoamericanists, our approach very much relies on cross-sectional and long-run international comparisons.⁶

Our interest in analyzing labourers' living standards also responds to the work by an increasing number of authors inspired by the influential ideas of Engerman and Sokoloff (1994, 2002, 2005) and Acemoglu et al. (2002). They jointly offer an image of early modern Latin America institutional framework as based on 'extractive' institutions intended '*to force the local population to work in mines and plantations*' and resulting in that extreme '*inequality in*

² See Van Zanden (1999, 2002), Allen (2001, 2003, 2005, 2007 and 2008) and Allen et al. (2005a, 2005b and 2010).

³ See e.g., Ozmucur and Pamuk (2002), Bassino and Ma (2006), Broadberry and Gupta (2006), Malanima (2007), Gupta and Ma (2010), Pamuk and Van Zanden (2010), among others.

⁴ See, i.e., Frank (1998), Landes (1998, 2006), Wong (1997), Pomeranz (2000), Vries (2001, 2003), Parthasarathi (1998, 2005), Jones (2003), Maddison (2005, 2007), Goldstone (2008) and Baten et al. (2010).

⁵ To the best of our knowledge, only the following monographies and edited volumes offer significant information and insights: Carmagnani (1963), Van Young (1981), Tandeter and Wachtel (1983), Velasco (1989), Johnson (1990a, 1990b), Quiroz (2009) and Salvatore, Coatsworth and Challú (2010). Scattered and fragmentary evidence is less scarce (e. g. Gibson, 1967; Humboldt, 1822:1991; Brading, 1983; Ladd, 1992) albeit more often than not hard to collect since it is usually published in articles and books of limited circulation. Dobado and García (2009, 2010) employ both primary and secondary sources. The latter alone are used by Dobado (2010) and Allen et al. (2011).

⁶ The Global Price and Income History Group (hereinafter GPIHG) and Peter Lindert and Leticia Arroyo in particular have made possible an easy access to a number of rich secondary sources through its web page (<http://gpih.ucdavis.edu/>). By sharing his databases in the web page of the International Institute of Social History (hereinafter IISH), Robert Allen has significantly facilitated our work. Amílcar Challú's generosity with his data deserves to be acknowledged.

wealth and human capital came to characterize much of Spanish America.⁷ 'Extractive' institutions and high inequality would be detrimental for economic growth and therefore explain the 'reversal of fortune' (Acemoglu et al., 2002) and the 'divergent paths of development' (Engerman and Sokoloff, 2005) that divided the fortunes of the former European colonies in America into basically two groups: North America and the rest. The institutional framework established right after the Conquest –and century-long persistent- would be the explanatory factor behind Spanish America economic history. This view has become very appealing to economists and economic historians despite its non-empirical foundations. Studying living standards of the commoners in Bourbon America proves to be an appropriate test for these neo-institutional hypotheses. One of the goals of this paper consists of assessing the consistency between the available empirical evidence and the pessimistic inference on living standards –i.e. those areas, such as the Inca and Mexica empires, with abundant indigenous populations- logically derivable from a view based on the notions of intense labour extraction and extreme inequality. Previous, less comprehensive attempts were presented in Dobado and García (2009, 2010) from which this new work draws.

Mainstream views on living standards in Bourbon America might be biased by the fact that the importance reached by wage labour is generally underestimated. Johnson's words are interesting in this respect:

*'Little attention has been paid to wage labor in the history of colonial Spanish America. Yet across the empire, wage labor was increasingly important in urban manufacturing and service sector and in mining from the mid seventeenth century.'*⁸

As to mining, this '*little attention*' is most surprising since it was a leading economic activity in the main territories of the Spanish Monarchy in America (the Andes and New Spain) and much less dominated by forced labour than commonly assumed (Bakewell, 1971, 1989, 2004). It is also probably not recognized that Spanish America was a relatively urbanized region. Cities were '*clearly a pivotal factor in the development of colonial Latin America.*'⁹ By 1800, according to Bairoch, '*it was the most urbanized continent*'.¹⁰

On the other hand, abundant evidence suggests that wage labour was also present, more commonly than usually assumed, in rural areas (Monteiro, 2006, p. 228). A labour market appeared soon after the Conquest (Coatsworth, 2006, p. 265). Even those authors that

⁷ Acemoglu et al., 2002, p. 1279; Engerman and Sokoloff, 2005, p. 4.

⁸ Johnson (1997, p. 1).

⁹ Socolow and Johnson (1981, p. 51).

¹⁰ Bairoch (1985, p. 498). Translation from the French by the authors.

emphasize –and probably exaggerate- the extension over time and space of varied forms of coerced labour (*encomienda, repartimiento, mita, debt peonage, etc.*) acknowledge their coexistence with wage labour and its increasing role as an effective means for recruiting workers (Keen and Haynes, 2008).¹¹ Moreover, the payment of wages was so widespread in Spanish America since the second half of the sixteenth century as to become an inseparable part of most forms of coerced labour, whether by law or by everyday practice. According to Coatsworth, wages were used by some employers ‘to lure indigenous workers away from the employers to whom they had been assigned’ by repartimiento.¹² Circa 1800, wage labour was important even in plantation zones (Johnson, 1997, p. 2), being probably dominant in the whole Spanish America’s economy as a result of a long evolutionary process leading from bondage to market forces (Monteiro, 2006, p. 232). In all probability, it was far more significant than usually recognized by mainstream literature.

Likely, this ‘*little attention*’ to wage labour might parallel an underlying overestimation of coerced labour significance. It is very often forgotten that ‘*institutions of private property*’, such as markets for factors (land, labour and capital) precisely appeared in America after 1492 since they were nonexistent in Pre-Columbian economies. Certainly, ‘*extractive institutions*’ did exist in Bourbon America, but *encomienda, repartimiento, mita* and slavery were neither ubiquitous nor permanent from Conquest to Independence. On the contrary, they always functioned alongside –and interacted with- genuine ‘*institutions of private property*’, not to mention those of communitarian character.¹³ While the ‘*private property*’ institutions –i. e. labour markets- increasingly expanded across time and space in Spanish America, those of extractive nature tended to contract and even to disappear, if unevenly. In other words, persistence did not prevent the early nineteenth century institutional framework from being

¹¹ According to Yeager (1995), the number of *encomiendas* in most Spanish America declined after 1575. By 1790 they have disappeared. The decline started earlier and was faster in New Spain and Perú. At its highest, in the second half of sixteenth century, the number of *encomiendas* was less than 600 and 500 in New Spain and Peru, respectively. Klein claims that the 1650s ‘*marked the end of their great period of massive slave importations*’ in New Spain and Peru (Klein, 2007, p. 26). *Repartimientos* in New Spain were abolished with some exceptions in 1631 (Lira y Muro, 2000, p. 337). From mid seventeenth century on, major demand for African slaves came from Portuguese America and the Caribbean, not from the main centres (New Spain and the Andes) of the Spanish Monarchy in America. *Mita* was far from universal in Andean mining (Bakewell, 2004, p. 240).

¹² Coatsworth (2006, p. 264).

¹³ *Mitayos* in Potosi were paid four reales de plata (more than 12 grams of silver) per working day (Tandeter, 1992, p. 67). Daily wages for labourers allotted within the *repartimiento* system in New Spain were fixed at 1.5 reales de plata per day (4.65 grams of silver) during 1603-1610 and at 2 reales (6.2 grams of silver) in 1629 (Gibson, 1967, p. 255).

significantly different to the late sixteenth century's. Thus, wages matter not only when it comes to studying living standards in Spanish America but also to properly understanding the economic history of this part of the world.

An important novelty of our approach to living standards is that it consists not only of studying wages but also heights. This biological measure of welfare has gained acceptance among social scientists over the last decades (Steckel, 2008). Thus, from the late 1990's onwards, studies on physical statures for Argentina, Bolivia, Brazil, Colombia, Guatemala, Mexico, Peru, and Puerto Rico in the nineteenth and the twentieth centuries have been published.¹⁴ By contrast, the available evidence on the eighteenth and early nineteenth centuries is scarce. As far as we know, only Challú for central Mexico (2009, 2010), Grajales-Porras and López-Alonso (2011) for two villages of the Intendency of Puebla and Salvatore (1998), and Salvatore and Baten (1998) and Baten (2010) for Argentina have dealt so far with heights in that period. Thus, it is clearly necessary to widen our knowledge on the levels and the trajectories of height in pre-independent Spanish America and, by doing so, to fill the gap in information with respect to other parts of the world. To do that, we have built a relatively big database of heights from different parts of Spanish America. This sample shows that Spanish Americans males were not generally so short as to give support to the pessimistic assumption on living standards. Moreover, we do not share the somber view on the dynamics of the Mexicans' biological wellbeing from the 1740s to the 1840s suggested by Challú (2010).

When the black box of living standards is, even if partially, opened, it turns out that neither were wages (nominal or real) so low nor were heights so short as to support the pessimistic view embodied in the neo-institutional literature. Our results also contrast with those of Allen et al. (2011) since these authors place *'the Latin American countries among the least developed countries at a similar level to Southern European and Asian countries.'*¹⁵ Whether our alternative, rather optimistic view is robust to the extension of the sample or to changes in methodology is to be seen. Nonetheless, the evidence presented in this paper seems to be far from insubstantial or irrelevant. On the contrary, our limited optimism is based on an unprecedented accumulation of data on wages and heights for the period under consideration. Our international comparative approach suggests that, in terms of living standards, the Great Divergence in Spanish America owes much to post-independence

¹⁴ See recent reviews of this literature in Martínez-Carrión (2009) and Baten and Carson (2010).

¹⁵ Allen et al., (2011, p. 1). See next section for a discussion of their findings.

developments. From which it follows that estimates of Spanish America GDPs per capita (i.e. Coatsworth, 2008; Maddison, 2009) might be downward biased. Some indications of it can be seen in Dobado and García (2009, 2020) since the ratios of unskilled workers real wage and average male height to GDP per capita present comparatively low values in Bourbon Spanish America.

More generally, it is our contention that important aspects of the mainstream view on the economic history of Spanish America from conquest to independence need a revision in depth. This revision has already been partially initiated by some authors (Prados, 2007, 2009; Grafe and Irigoin, 2006; Irigoin, 2008, 2009, 2010; Dobado and García, 2009, 2010; Dobado and Marrero, 2011).

This paper is organized as follows: the next section is dedicated to nominal (silver) and real wages; the third section deals with physical statures; some final remarks appear in the last section.

Wages

In this section wages of unskilled (urban and agricultural labourers) workers are firstly presented in terms of silver grams per working-day. Using unskilled workers' wages to study living standards has become conventional in the literature. Besides, it responds to the assumption of extreme inequality in Spanish America.¹⁶ Thus, only the least privileged wage earners are considered which excludes slaves but not other forms of coerced labour (i.e. *mitayos* of Potosi). We proceed by showing real wages, which are defined as the power purchasing parity of silver wages in terms of the most popular grain and meat among the commoners (corn and beef in Mexico, wheat and mutton in Istanbul, rice in Asia, etc.). We have also estimated the power purchasing of wages in terms of a colonial good: sugar. Using these three produces permits to explore the consumption possibilities offered by silver wages along the range of income-price elasticities. While grain was widely consumed by commoners in most parts of the world, meat was scarcely present in their daily diet and sugar was even rarer and might be considered a delicacy. Our approach, then, estimates the purchase power of wages in terms of calories, proteins and luxury-goods. We present those estimates both: a) synchronically (extending as widely as possible the comparison at the beginning of the

¹⁶ Wages of skilled workers from an international comparative perspective are shown in Dobado (2010) and Dobado and García (2009, 2010).

nineteenth century between a number of Spanish American cases with the rest of the world); and b) diachronically (showing its evolution in Bogota, Mexico and Potosi throughout the eighteenth century along with that at the top (Britain) and the bottom (Italy) of the distribution of real wages in the West).

Thus, we depart from the standard methodology –designing baskets consumption, estimating its cost and using it as a deflator of nominal wages- for studying real wages and living standards over several centuries (e.g. Allen, 2001, 2007; Allen et al., 2010; Allen et al., 2011). We disagree with applying that methodology to early modern Spanish America for several reasons.

Firstly, our approach does not need any assumption to start with. On the contrary, Allen et al. (2011) base their approach on two arguable premises such as the uniformity of consumption patterns: a) across the world; and b) within Spanish America. That a certain similarity existed is probably true but differences were far from negligible and are overlooked when only a basic, standard basket is specified. Influencing consumer decisions, economic circumstances and cultural practices were extremely diverse in Spanish America. In spite of some degree of market integration and cultural exchange within Spanish America, differences in nutritional tradition and availability of staple food between Mesoamerica (maize, squash and bean) and the Andes (potato, quinoa and charqui) or between the Southern Cone (wheat and beef) and the Caribbean (rice, bean and dried beef) were significant among commoners as well as elites. They presumably were larger than in other, more homogenous parts of the world in terms of geography and culture (e.g. Europe and East Asia).¹⁷ For obvious geographical reasons, sizable differences within Spanish America are also apparent in terms of the need of protection against weather (clothing, fuel, etc.), not to mention those between parts of North America and many others in the rest of the continent.

Secondly, the Columbian exchange could hardly leave unaffected Spanish America. In fact, this part of the world was the most affected by the exchange of animals and plants after 1492. The diffusion of the new species that so dramatically expanded the food supply was uneven across time and space. However, by the time of the Independence, aboriginal diets of the different territories had experienced more or less deep changes throughout the whole

¹⁷ Even for a relatively homogeneous case, such as that of Spain, the detailed study by Llopis et al. (2009) finds differences, albeit slight, in consumption patterns between three towns (Madrid, Palencia and Seville).

social spectrum. The transformation of the original patterns of consumption was reinforced by the opening of those territories to long-distance intra-continental and intercontinental trade. Good instances of the joint effects of diffusion and commerce are cocoa and sugar. For Menegus and Tortolero (1999), the two goods were complementary and widely consumed by all social classes in New Spain as a result of cocoa imports from Guayaquil.¹⁸ But it was not only New Spain and cocoa-producing areas. Humboldt observed a *'great consumption of sugar in the Spanish America, even among the least well-off'*.¹⁹ He also pointed out that in *'the Spanish colonies chocolate is not considered a luxury but a basic foodstuff'*.²⁰ Besides, changes in relative prices –e.g. grain to meat, sugar to grain, etc.- produce different substitution effects in each country that can not be captured by using very long-term fixed consumption baskets.²¹

Thus, especially in Spanish America, the very idea of an immutable consumption basket over three centuries seems inconsistent with a substantial body of evidence.²²

Thirdly, being its outcome the computation of four -Bogota, Mexico (rural and urban) and Potosi- continuous very long-term (three centuries in some cases), the approach chosen by Allen et al. (2011) is very data-demanding. Since the available information on early modern Spanish America prices and wages is clearly incomplete, different procedures for filling in a plethora of blanks (regressions, interpolations, averages, assumptions on the behaviour of markets and goods, etc.) need to be applied repeatedly. While nominal wages in preindustrial economies exhibit low short-run volatility and weak or no trend, the prices of grain and other staples experience intense fluctuations from year to year and long-term change. This contrast between wages and prices is especially evident in Spanish America.²³ Therefore, missing-data

¹⁸ Miño confirms that imports from Guayaquil made possible the consumption of 'low price' cocoa by the 'poor'. Prices remained stable over the eighteenth century in Mexico: six and a half grams of silver per pound or less at retail (Miño, 2009, p. 16).

¹⁹ Humboldt, 1821:1991, p. 288. Translated from Spanish by the authors.

²⁰ Ibidem, p. 292. Idem.

²¹ Regarding the eighteenth and early nineteenth centuries, this objection is far from merely theoretical. Differences in the long-term rate of growth of food prices are enormous across countries in some cases: while in Mexico corn and meat price grew at roughly the same pace, in Bogota the growth of the price of meat clearly exceeded those of corn and potato (<http://gpih.ucdavis.edu/>). More similar instances could be given.

²² Allen et al. (2010) recognize the changes in the Europeans' diet when explaining the consumption basket used: 'late medieval in inspiration, in that it does not contain new commodities like sugar and potatoes introduced into Europe after the voyages of discovery.' (Allen et al., 2010, p. 17). In fact, they compute two different baskets for both China (Suzhou/Canton and Beijing) and Europe (Northern Europe and Milan).

²³ In some cases, (e.g. Bogota and Potosi) wages seem not to have changed at all over the whole eighteenth century in nominal terms. In New Spain, only minimal variation around a basically stagnant trend is perceptible. In terms of silver, the small decrease in nominal wages observed in the very long-

intervention might be acceptable within some limits in the case of wages but not in that of prices.²⁴

Fourth, even if all these difficulties were considered minor, the fact still remains that the 'universal' consumption basket estimated by Allen et al. (2011) clearly contrasts with the pattern of consumption revealed by other baskets specifically designed for Spanish America - i.e. Arequipa (Brown, 1990), Buenos Aires (Johnson, 1992) and Santiago de Chile (Larraín, 1992). Differences between the simple (four items) and '*quasivegetarian*' food component of the former and the diversity and relative sophistication of the latter are significant.²⁵ Regarding Spain, some of the assumptions by Allen et al. (2011) do not seem realistic either: '*Meat was rare and consumed mainly in ceremonial occasions. Alcohol was seldom enjoyed.*'²⁶ As to alcohol, neither fit habits in some American territories with that claim.²⁷ Thus, an excessively simple basket -maize, beans/peas, meat and butter (Allen et al. (2011, p. 43)- fails at capturing the complex reality of food consumption in Bourbon Spanish America.

run is caused by several slight debasements of the real de a ocho. Similar instances may be found in Europe as well. Allen's database of wages for labourers exhibits long-term perfect immobility in Amsterdam (1755-1840) and Antwerp (1682-1815). Variation is also very small in London and Southern England between 1735 and 1792 since only small temporary changes are registered. (<http://www.iisg.nl/hpw/data.php#europe>).

²⁴ Even in more developed markets for goods and factors, such as those of London and Southern England, differences in volatility between the prices of wheat and labour are significant, being their coefficients of inter-annual variation 51.3 and 18.6 per cent, respectively, in 1700-1810. (<http://www.iisg.nl/hpw/data.php#europe>).

²⁵ Brown (1990) estimates the cost of two baskets ('Spanish' and 'Mestizo') for Arequipa. Bacon, mutton, sugar, potatoes and coca leaves are found among the main goods consumed by the Mestizo families. In Buenos Aires, meat, fish (fresh and dried) and *hierba mate* were important parts of the commoners' diet (Johnson, 1992). As to the structure of the expenditure in Santiago de Chile: a) it is rather diverse as well since fat, sugar, animal proteins (dried beef, mouton, fresh and dried fish and seafood), fruits and vegetables (potatoes) are included along with wheat and flour; b) the share of non-vegetarian -animal fat excluded- items is 27.1% in 1754-1758 (Larraín, 1992, p. 122).

²⁶ According to Llopis et al. (2009) meat and wine played a role more important than expected in the consumption patterns of the urban population of eighteenth-century Spain. Meat share in the food component of the price index estimated for Madrid, Palencia and Seville are 24, 25 and 31 per cent, respectively. That of wine is 12 per cent both in Madrid and Seville.

²⁷ Alcohol and stimulant beverages -basically wine- amount to a 7 per cent of the expenditure in mid-eighteenth-century Santiago de Chile. In Buenos Aires, wine and eau de vie were increasingly consumed in the late Bourbonn period (Johnson, 1992, p. 166). Humboldt mentioned the 'enormous quantity' -if compared with total alcoholic beverages sold in Paris- of pulque consumed by Mexican inhabitants of varied ethnic origin ('Indians, mestizos, mulatos and even most of the creole whites' (Humboldt (1822:1991, p. 133). Likely, chicha was no less popular among the Andean population.

Because of these reasons, our estimate of real wages yields straightforward, intuitive results that, as it will be soon seen, turn out to offer a less pessimist view of living standards in Bourbon America than that of Allen et al. (2011)

One more methodological observation is worth considering. Wages reported in some sources might well not be those effectively paid to workers. That is particularly true if wages are taken from administrative sources in regulated labour markets or from very general references. Thus, in eighteenth-century Potosi, both *mingas* (free workers) and *mitayos* (coerced, albeit wage-earners, workers) effectively increased their earnings through working longer hours than those established by custom for the former and by law for the latter (Tandeter, 1992). At the same time, the inhabitants of Potosi –mitayos and their families included- had free access to the mines during the weekends for extracting and processing mineral. This practice was known as *kajcheo* and might have substantially contributed to raising the incomes of an undetermined –albeit not unimportant- part of Potosi’s permanent and temporary population.²⁸ On the other hand, mitayos might be helped by their families’ unpaid work when excessive labour obligations were assigned to them (Tandeter, 1992). In New Spain, the *partido* -a variable part of the mineral extracted by some miners during the working day- was an integral and significant component –if unregistered in the available sources- of their earnings (Brading, 1983; Ladd, 1992; Velasco, 1989). Moreover, the importance of partidos was such that miners ‘in many regions were practically partners of their patrons.’²⁹ The attempts to reduce or eliminate partidos were a constant source of labour conflicts in New Spain’s mining centres (Ladd, 1992; Keen and Haynes, 2008). As to other sectors of the wage labour force (i.e. rural and urban labourers), cash payments were frequently supplemented with others in kind of undetermined and variable magnitude.³⁰

Wages by early nineteenth century

Table 1 shows daily monetary wages –average of the available data for the 1800’s- in terms of grams of silver for a sample of cases across the world, except Africa. When possible, real

²⁸ Silver obtained by this segment of the inhabitants (*kajchas*) was far from insignificant: more than one third of total legally registered production (Tandeter, 1992, p. 124).

²⁹ Brading (1983, p. 201). Translation from the Spanish by the authors.

³⁰ There might be good economics reasons for the generalization of payments in kind frequently observed in underdeveloped –colonial or not- economies. In-kind wages can be more effective to increase the supply of labour than wages in cash when food-security considerations are important for workers –i.e. poverty or thin food markets (Kurosaki, 2011).

wages, estimated as their purchasing power in terms of kilos of grain, meat and sugar for the same years, are also depicted. Technical details may be seen in Appendix 1.

INSERT TABLE 1 ABOUT HERE

Monetary wages

Despite the fact that the international economy, in particular markets for silver, has reached a non-negligible level of integration by early nineteenth century (Flynn and Giráldez, 2004; Broadberry and Gupta, 2006; Marichal, 2006), variance in silver wages is significant, presumably higher than in GDPs per capita. As expected and confirming a well-known fact at least since Adam Smith's times, silver wages were substantially higher in the United States and the UK than in other parts of the world and much lower in Asia than elsewhere. Less expectable was perhaps to find Spanish American wages in medium to high levels. As opposed to views of mining in the Post-Columbian period as a case of economic activity based on exploitative, unskilled miners (Potosí, Guanajuato and Chile) was well paid by international standards, even mitayos (Potosí (1,6) in Table 1).³¹ Wages of rural and urban Spanish American labourers surpassed those in Southern (some Spanish provinces being an exception), Central and Eastern Europe and Asia.³²

Grain wages

That Spanish American silver wages were comparatively medium to high from an international perspective may be considered expectable in a silver-producing region. However, interestingly enough, their power purchasing in terms of grain compare even more favourably with those of the rest of the world. In fact, they are relatively higher than silver wages. This improvement in relative positions does not seem to be caused by any selection bias –the samples do not exactly match to each other because of data availability problems- since it is experienced by most of Spanish American territories (New Spain, New Granada and Upper Peru).³³ Buenos

³¹ See those views in Engerman and Sokoloff (1994, 2002, 2005), Acemoglu et al. (2002) and Bruhn and Gallego (2008). A critique in Dobado and García (2010) and Dobado and Marrero (2011).

³² That silver wages in Bourbon America were clearly higher than in Asia is consistent with Broadberry and Gupta (2006) and Allen et al. (2010). According to Allen et al. (2011), silver wages in Potosí (mitayos) and Mexico were third only to North America and London and Southern England towns while those in Bogotá and rural New Spain were surpassed only by those in Amsterdam, Madrid and Antwerp and higher than in the rest of the world.

³³ Most likely, Chilean grain wages must have been also comparatively high, as this General Captaincy was a net exporter of wheat. Moreover, flour prices in grams of silver were substantially and

Aires should be considered an exception owing to temporary especial circumstances.³⁴ Our findings suggest, at least as far as the main component of the pre-industrial diet is concerned, that Spanish America as a whole does not seem to experience any 'Dutch disease' by early nineteenth century.³⁵

Had the silver wages in some European countries been deflated by prices of rye, a rather inferior cereal, instead of wheat prices the picture emerging from Table 1 would be slightly, but not significantly, different since the former was usually cheaper than the latter (about one third). In any case, it seems clear that Spanish American silver wages provided a comparatively decent standard of living in terms of calories. Thus, while these findings do not support revisionist assertions on Eastern living standards before the Great Divergence, they suggest that pre-independent Spanish America was closer to the most developed Western countries than to other parts of the world.

We do not see confirmed in our sample the claim by Broadberry and Gupta that *'the gap between the "silver wage" and the "grain wage" can hence be used as an indicator of the level of development.'*³⁶ This is probably caused by the distortion effect owing to the widening of the sample as to include the Americas, where silver and grain wages tend to be both relatively high. On the contrary, we find a positive correlation between silver wages and grain wages within our world-wide sample. This correlation increases when only the American subsample is considered.

Meat wages

Our examination has also taken into account the possible objection that grain may be viewed as insufficient evidence regarding living standards and physical welfare. Therefore we estimate power purchasing of wages in terms of meat, a superior good and a rich source of animal proteins, that was scarcely present in the preindustrial diet of most of the world population.

increasingly lower in Santiago de Chile than in Pennsylvania between 1720 and 1805 (<http://gpih.ucdavis.edu/Datafilelist.htm>).

³⁴ A period of abnormally high wheat prices started in 1803 as a result of intense drought and political and military turmoil (Johnson, 1992, p. 182). The average price in 1803-1806 tripled that of 1791-1802 (Ibidem, pp. 170-171)

³⁵ Apart from the especial case of Buenos Aires, most grain prices in terms of silver turn out to be rather medium to low within the available sample of international markets (25 cases). Only Potosi appears among the five most expensive markets for grain. However, in spite of it, grain wages of free miners and mitayos in Potosi are well above the average and the median.

³⁶ Broadberry and Gupta (2006, p. 3).

As it may be seen in Table 1, Spanish American, especially Argentine, meat wages were high to very high, comparable to North American's and clearly ahead of European's, let alone, presumably, Asians'. The main explanation behind this somewhat surprising finding is the fact that meat was relatively un-expensive in many parts of Spanish America.³⁷ Only in Potosi prices are above the sample average which does not prevent its meat wages from being higher than in most Europe and Asia.

Thus, as opposed to the general –North America excepted- preindustrial case, meat could be an important part of the diet of the commoners in Spanish America in spite of the limitation in consumption established by the Catholic Church in form of abstinence in certain days (Johnson, 1990). This was well known for Argentina and would hold true even if our source might underestimate the meat price in early nineteenth- century Buenos Aires.³⁸ More surprising is to be informed of the high levels of meat consumption in Mexico found by Quiroz (2005): an estimated of 142 kilos per capita in 1767. Quite a lot by any standard of that era!³⁹ While the pre-Colombian population had a limited and uneven access to animal proteins, the new economic system made it much easier and widespread, at least in towns, by means of combining the adoption of previously nonexistent species (cattle, sheep, goat and pig) and the regulation and support of the market for meat. Meat became a popular produce to be consumed on a regular basis even by the aboriginals (Quiroz, 2005, p. 65). Even if the contribution to total consumption of meat in Mexico made by poultry (almost 20%) is subtracted, New York still lags far behind. This comparison highlights the impressive consumption of made by Mexico inhabitants, almost twice as much as North Americans –not to mention Europeans- and is consistent with the picture depicted in Figure 1. However, meat consumption might have decreased by late eighteenth century. Humboldt, quoted by Quiroz

³⁷ Even if the particular case of Buenos Aires is disregarded, prices of meat in Spanish America are at the bottom of the available sample (19 cases): beef was five to six times cheaper in New Spain markets than in London and Southern England while in Massachusetts was more than twice as expensive as in Bogota. Data from Barrett (1974) show that meat price was also low by international standards in Cuernavaca and therefore local rural labourers had a relatively high meat wage as well. Circa 1800, prices were surprisingly low in Arequipa: less than ten grams of silver per sheep (Brown, 1992, pp. 213-214).

³⁸ 'This region has no more abundant food than beef. Most of the contemporary accounts by European travellers dwell on what they saw as the profligate waste of meat in the pampean region. (...) It is safe to assume that the primary result of this bovine abundance was low beef prices.' Johnson (1990, p. 147).

³⁹ Consumption of red fresh meat by New Yorkers grew from 132.3 pounds in 1790 to 166.5 between 1795 and 1816 (Baics, 2010, p. 7). Meat consumption in the Thirteen Colonies was slightly higher than in Republican New York (Baics, 2010, p. 9).

(2005, p. 44), estimated total meat consumption in Mexico at 189 pounds per capita in 1791: a substantial fall indeed, but still far higher than the norm in Europe and other parts of the world.⁴⁰ And it was not only Mexico inhabitants as well as urban and rural labourers in New Spain by early nineteenth century, in the 1760's miners of Real del Monte were able to buy relatively huge amounts of meat with just a part of their daily silver wage (Ladd, 1992, p. 34). Besides, the case of New Spain does not seem to be the exception but rather the rule within Spanish America as the meat wages in Table 1 clearly show. As to Chile, Quiroz (2009) shows comparatively meat-intensive consumption patterns in Santiago.

Thus, a certain likeness across the Americas in terms of meat consumption emerges from Table 1. This is probably due to a basic similarity in factor endowments (i.e. abundant land and scarce labour) which openly contrast with those of most Europe and Asia. Besides reflecting an important advantage in living conditions, such as the possibility of consuming animal proteins, relatively high meat wages also point against any unsophisticated version of the idea of extreme economic inequality in Spanish America. That is so because eating meat was taken as one of the clearest indication of status in Europe, where meat became a luxury from the second half of the sixteenth century until well into the late nineteenth or, even, the twentieth century (Livi, 2000, p. 49).

Sugar wages

It may be seen that sugar –a proxy for those luxury goods resulting from the Columbian exchange and a rich source of calories as well- wages in Spanish America were similar, or in some cases even higher, than in most developed parts of the world –see Table1.⁴¹ If, according to Hersh and Voth (2009), European living standards improved through gains from new goods (sugar, chocolate, tobacco, etc.), Spanish American labourers seem to have significantly –and

⁴⁰ The representative basket of an average urban consumer in the Ottoman Empire includes 51.2 kilos of mutton per year. (Özmucur and Pamuk, 2002, p. 298). In their attempt at capturing the 'subsistence lifestyle' in China (Suahou/Canton and Beijing) and Europe (Northern Europe and Milan), only 3 kilos of meat/fish per male per year are computed. Exactly the same quantity of meat appears in the basket specified for the Americas in Allen et al. (2011).

⁴¹ While the share of 'sugar and sweets' in the structure of expenditure estimated by Larraín (1992) for Santiago de Chile in 1754-1758 is 6.5 per cent, neither Özmucur and Pamuk (2002) nor Allen et al. (2010) include it in their representative basket for, respectively, the Ottoman Empire and China, Europe, Japan and India. Sugar is also part of the basket specified for Arequipa's mestizo families by Brown (1992). Go and Lindert (GPIHG) consider sugar in their comparison of real wages between nineteenth-century Massachusetts and West Virginia and eighteenth- and nineteenth-century Massachusetts and England.

probably earlier- benefited from this outcome, an increase in welfare, from the Age of Discovery. In other words, at least as far as sugar is concerned, the early-modern consumer revolution in the West likely started in some of the American territories of the Spanish Monarchy.

Summarizing, the empirical evidence shown in this subsection does not seem to support the conclusion that, when international compared, Spanish American urban and rural labourers and unskilled miners suffered from low real wages by early nineteenth century, rather the contrary turns out to be true, especially in terms of luxury or quasi-luxury goods such as meat and sugar.

Real wages over the Bourbon period

This subsection shows a comparison of real wages for unskilled workers in Spanish America (Bogota, Mexico and Potosi) and Europe (London and Southern England and Milan) over the Bourbon period.⁴² Thus, we firstly check for the robustness of our estimates when the time span is significantly expanded and secondly test the pessimistic hypothesis regarding the evolution of real wages and living standards of Spanish American labourers that predominates in the specialised literature on the Bourbon period.

Grain wages between 1700 and 1813 are depicted in Figure 1.⁴³

INSERT FIGURE 1 ABOUT HERE

It may be seen that grain wages were significantly lower in Milan than in the rest of cases. They also followed a downward trend since the 1760's. As expectable, grain wages were much higher in London and Southern England. However, they share a similar falling trend that started even earlier. This trend is also experienced in Bogota and Mexico but not in Potosi,

⁴² According to Allen (2001), London and Southern England and Milan may, respectively, represent the top and bottom values of the range of real wages and living standards within the European countries of intermediate to high level of economic development over the eighteenth and early nineteenth century. The three Spanish American cities were different in relevant respects (size, location, political and economic functions, etc.). Mexico was the biggest city in the Americas until the nineteenth century and the capital of the main Viceroyalty. Bogota had a much smaller population (roughly one tenth of that of Mexico) and a relatively simple economic life. Potosi, an important Andean mining centre, is generally assumed to be the epitome of the Spanish colonial exploitation in America

⁴³ As to Mexico, since nominal wages of building labourers remain practically constant all along the eighteenth and early nineteenth century, missing observations in those years for which data on corn and meat prices are available have been replaced by the value of the previous one –i.e. we assume that nominal wages between 1719 (8.5 grams of silver) did not change until 1732 (9.3 grams of silver) or between 1738 (9.3 grams) and 1752 (9.3 grams).

where they remained basically constant. From the 1760's on, grain wages in Bogota frequently were by far above those in London and Southern England. This was not the case in Mexico during the first half of the eighteenth century. Afterwards, the Mexican and the English series shared a downward trend and converged in levels. Thus, grain wages in Bourbon Spanish America were generally at similar levels as, and occasionally higher than, in the richest European country and, with the exception of Potosí, registered a comparable falling trend during the late decades before Independence.

Figure 2 shows meat wages between 1700 and 1810.

INSERT FIGURE 2 ABOUT HERE

During the first half of the eighteenth century meat wages in Spanish America were higher than in Europe. The difference was especially significant in Mexico and Bogota. In all cases, sooner (Bogota and Potosi) or later (Mexico) meat wages decreased during the second half of the eighteenth and the early nineteenth centuries in Spanish America. This fall took place also in Europe. On the other hand, at the end of the period under consideration meat wages of the Mexicans remained above those of the Londoners and Southern Englanders while in the three Spanish American towns were still much higher than in Milan.

Summarizing, grain and meat wages in Spanish America do not seem to have been lower than in the most developed European country. In both cases, as well as in Milan, they deteriorated over the late eighteenth and early nineteenth century, Potosi being an exception. Thus, the worsening of living standards in some Spanish American territories during the late Bourbon period was all but exceptional in the West, excluding parts of the US –i.e. Massachusetts (Go and Lindert, GPIHG)- but not Maryland (Adams, 1986).

No inconsistencies seem to arise between the synchronic and diachronic exercises performed in this section. The two of them are coincident at suggesting that: a) there seems to be well-founded room for some optimism regarding the real wages of Spanish American labourers of the Bourbon period; and b) the Great Divergence in Spanish American real wages, as opposed to what happened in the East (Broadberry and Gupta, 2006; Allen et al., 2010) rather is a nineteenth-century phenomenon.

Heights

Evidence on heights is presented in this section. An international comparative perspective has also been adopted. Our hand-collected data for Northern and South Eastern areas of New Spain and the General Captaincy of Venezuela (Maracaibo), hereinafter Venezuela, come from archival sources: *filiaciones* and muster rolls of the militias.⁴⁴ Thus, we have been able to build a data base of almost 6000 observations that may be considered a fairly representative sample of generations born between 1730 and 1780 in those territories.⁴⁵ As in our previous works – see Dobado and García (2009, 2010)-, estimates of male average heights have been obtained by means of the standard methodology proposed by Komlos (2004).⁴⁶

By substantially expanding the available evidence on heights, it is possible to significantly widen the picture of biological standards of living in pre-independent Spanish America. This picture is basically consistent with our findings on wages and confirms our contention about relatively high living standards –see Table2.

INSERT TABLE 2 ABOUT HERE

As it may be seen, by mid eighteenth century Northern New Spaniards appear within the medium range of the international sample for the eighteenth century. Significantly enough, they were taller than in some European countries, not to mention Asia. Our finding of relatively high height for Northern New Spaniards contrast with the poor health index –the lowest two within a sample of 65 archaeological sites across the Americas over the last seven millennia- estimated by Steckel et al. (2002) for pre-Spanish aboriginal populations of New Mexico. Whites from Venezuela were even rather tall by Western standards of the period. According to Challú (2009, 2010) estimates, Central Mexico would lay within the mid-low range of countries shown in Table 2, at a similar level to that in Spain. *Blancos* from South Eastern

⁴⁴ These auxiliary forces were recruited by conscription (Marchena, 1992). *Filiaciones* are individual documents originated with identification purposes that include personal and professional information (service term, payments, unit, place of recruiting, war actions, etc). Most of our data for Northern New Spain come from this source. Muster rolls, a list which reports height, age, and, if occasionally, other personal and professional information for every militiaman, are the source of data for South Eastern New Spain and Venezuela.

⁴⁵ Representativeness of the data base is greater than in the case of a professional army since militias were formed through universal adult male conscription of which only those suffering from serious physical handicaps or below the minimum height requirement, the public servants and the most skilled professionals were excluded (Marchena, 1992).

⁴⁶ Basic information on the data set is shown in Dobado and García (2009, Table 1). More technical details may be found in Dobado and García (2009, 2010).

New Spain were clearly short, albeit taller than Indonesian slaves born between the 1770s and 1790s (157.4 centimetres) and Japanese of the Edo-Tokugawa Era (159.2 or 157.2, depending on the calculation formula).⁴⁷ However, South Eastern New Spain blancos' height may also be found in less-developed European countries and regions at some point during the eighteenth and nineteenth centuries (e.g. Russia or Limousin and Orleans in France, among others).⁴⁸ Besides, it is doubtful that the sample of blancos is genetically comparable to that of Northern and Central New Spain. We suspect that South Eastern blancos actually had an important indigenous ethnic component. The fact that the indigenous population of Yucatán and Campeche was mainly comprised of Mayas, a population that has historically been one of the shortest in the globe (Ríos, 2009, pp. 227-230 and 233-234) might affect the comparison.⁴⁹ Mayans of ninth-century Copan also exhibit one of the lowest health index values in the American sample analyzed by Steckel et al. (2002). In contrast to South-Eastern New Spaniards, Argentine of the second half of the eighteenth century turn out to be -after the proper correction (Baten, 2010) of the estimates by Salvatore (1998) and Salvatore and Baten (1998)- among the tallest populations of the world: almost 170 cms. This finding is consistent with estimates by Salvatore (2007), Baten et al. (2009) and Baten (2010) for 1820's onwards – see Table 2. By 1810, Peruvians were not that tall, but neither shorter than some Europeans (Baten, Pelger and Twrdek, 2009; Twrdek and Manzel, 2010).

Pardos from Maracaibo were relatively tall while those from South Eastern New Spain are among the shortest human group in our sample. However, pardos from Campeche and Yucatán were not shorter than the inhabitants of some European regions in pre-twentieth century Europe either.⁵⁰ A racial gap certainly existed in Bourbon Spanish America as proved by the difference in height between blancos and pardos. Nonetheless, it evolved in a particular

⁴⁷ Baten, Stejl and van der Eng, 2010; Boix and Rosenbluth, 2004.

⁴⁸ For Limousin, Orleans, Austria-Hungary, Italy, Portugal, Russia and Spain see, respectively, Heyberger (2005), Schubert and Koch (2011), Komlos (1989), A'Hearn et al. (2009) and Breschi and Pozzi (eds.) (2007), Baten *et al.* (2009), Mironov (2005) and García-Montero (2010).

⁴⁹ Some reasons point to a possible downward bias in our estimation of height for South-Eastern New Spain. Militiamen height is closer to the European standards in the only case in which original data do not present a serious problem of heaping in the minimum height requirement (the Batallón de Infantería de Castilla, formed by blancos from Yucatán). Besides, officers' height was never recorded while only seldom that of the sub-officers. Additionally, most skilled workers were excluded from conscription. Besides, the modal value of the heights distribution, if heaping is omitted, is roughly 61 French inches (approximately 165 centimetres). Thus, our estimate might rather be considered the lower bound of South-Eastern New Spain height. Some of these remarks also apply for the rest of our New Spain's sample.

⁵⁰ See foot note 48.

way during the central decades of the century: falling in Venezuela and narrowing until practically disappear in South Eastern Mexico. In any case, this racial gap is substantially smaller than the gap founded in England by Komlos (2007) between the poles of the social spectrum, similar to the one observed between slaves and free whites in the United States (Margo and Steckel, 1983; Steckel, 1986- but higher than in nineteenth-century Brazil and Peru (Baten, Pelger and Twrdek, 2009; Twrdek and Manzel, 2010).

Confirming findings in health over the past seven millennia by Steckel et al. (2002), a relatively high variance in height is found across Spanish American territories. Likely this variance reflects substantial differences in income and productivity between territories similar to those shown in all available estimates for the early nineteenth century (Maddison, 2003; Coastworth, 2008; Prados, 2009).

Figure 3 shows the trajectories of heights for all different populations in our sample over the central decades of the eighteenth century.

INSERT FIGURE 3 ABOUT HERE

It is difficult to observe a clear trend in our data. However, they do not suggest any 'Great Decline' in heights starting by mid eighteenth century, as concluded by Challú (2009, 2010) for Central New Spain. We accept that, paralleling similar trends observed in most European countries by Komlos and Baten (2004), some decline in heights might have taken place in late eighteenth and early-nineteenth century New Spain. Nonetheless, the dramatic decline (almost five centimetres for the 1740's to the 1830's) from a rather high level to one of the lowest in the world found by Challú turns out difficult to believe since it is not accompanied by other demographic indicators pointing in the same direction. In spite of El Niño climatic events by late eighteenth and early nineteenth centuries and political shocks (independence wars and social upheavals from 1810 to 1821), population significantly grew from late eighteenth century to the mid nineteenth century (McCaa, 1998).⁵¹ On the other hand, the estimate by Challú at the end of the 'Great Decline' (barely above 160 centimetres in the 1830's) is clearly at odds with the heights found by López-Alonso (2010) for the 'rurales' in

⁵¹ A concentration of El Niño events negatively affected crops and prices, as well as heights, in the eighteenth- and early nineteenth-century Mexico (Challú, 2010, p. 43). However, these political and climatic shocks did not impede population growth: 0.8 per cent per in yearly average for 1790-1840, according to the revision by McCaa or almost 1.3, if estimated from 'conventional series' (McCaa, 1998). Those rates are not far from the annual averages estimated for 1840-1900 by McCaa's revision (1.1 per cent) or using 'conventional series' (0.9) (Ibidem).

the 1840's (166.5 centimetres) and by Carson (2005, 2007) for the Mexican inmates in North America prisons (167.1, 165.9, 163.8 and 163.0 centimetres for Northern Mexico, El Bajío, Central Mexico and Southern Mexico, respectively). Thus, in our opinion, the 'Great Decline' overestimates the real fall, if any, of Mexicans heights during the late Bourbon period.

Our findings for New Spain may be placed in a pluri-secular perspective in an attempt to assess the long terms effects on material welfare resulting from the dramatic –probably unparalleled in human history- changes that occurred in the Americas after 1492. Some evidence, if limited, on pre-Columbian physical living standards is available thanks to the bio-archaeological research conducted by a number of scholars.⁵² Their results offer a pessimistic view on late pre-Columbian America. Some historical evidence confirms the picture of a population suffering serious nutritional deficiencies. According to Marquez *et al.* (2002, p. 320), two conclusions may be drawn from previous research on statures in Pre-Spanish Mesoamerica: *'first, the existence of a northeast to southwest gradient in average stature, ...; and second a trend toward diminishing height over time.'*⁵³ Our findings are consistent with the long-lasting gradient observed across Mesoamerican regions. They also seem to support the idea that the trend toward diminishing height was somewhat interrupted or reversed in certain areas at some point after 1492 since eighteenth-century inhabitants of Central New Spain, not to mention Northern New Spain, were taller than most Mesoamericans of the late pre-Columbian period. Whether this hypothesis will prove correct is to be seen. If it were confirmed, explanations will need to be found. The increased access to animal proteins might be an important factor. Neither a higher productivity of the whole economy nor a lesser economic inequality in the post-1521 Mexican society should be overlooked. As to the first point, we agree with Coatsworth (2008) in that the introduction of new crops and, especially, new animals, facilitated by the demographic catastrophe of aboriginal population, brought about substantial gains in the productivity of the domestic-use agricultural sector in Mesoamerica during the first century of the Spanish rule. Those gains might well have been more long-lasting than claimed by this author, especially in Northern Mexico. And they

⁵² Bogin and Keep, (1998), Márquez and del Ángel, (1997), Márquez *et al.* (2002), Storey *et al.* (2002), Steckel *et al.* (2002).

⁵³ Mesoamerica might have not been exceptional. In Europe, a fall in the average physical stature at least since the sixth century is perceptible (Koepke and Baten, 2005). The decrease in height appears to have been widespread across European regions and especially large (almost 7 centimeters) in the best documented case, that of Scandinavia and the North-Atlantic, since the Middle Age until the nineteenth century (Steckel, 2004, p. 216). A similar pattern arises for Japan according to Hiramoto (1972).

probably were even bigger than assumed if the symptoms of crisis in the economy of the late Mexica Empire (overpopulation, famines, extra-mortality, etc.) which are mentioned by Knight (2002) and Semo (2006) are taken into account. On the other hand, living conditions in Post-classic Central Mesoamerica were harsh even if only *'because the Basin of Mexico is not an easy environment to live in with the pre-Spanish technology'* (Williamson, 2008, p. 20). Moreover, Steckel's view on health and nutrition in Pre-Columbian America is rather pessimistic and may help to see the post-Columbian period under a new light.⁵⁴ Regarding inequality, this author finds anthropometric evidence which points to an extremely unequal distribution of work effort and access to food in pre-Columbian highly stratified societies of Central America.

In our interpretation, data, scarce as they are, and inferences from the anthropometric approach to human material wellbeing in Spanish America from a very long-term perspective do not seem to support most of the usual assumptions on the post-Columbian period. Not, in particular, the notion of a 'reversal of fortune' in Mexico after 1500 (Acemoglu et al., 2002). From a long term perspective, the transfer of Western technology (cranes, crafts, mills, etc.), the increasing draft animal availability and a growing presence of proteins in the diet ought to have reduced the biological stress suffered by Pre-Columbian population in Mesoamerica. This inference is consistent with our finding of high, albeit declining, wages, particularly in terms of meat, in Spanish America.

Final remarks

This paper presents a partial revision of some widespread assumptions regarding the economic history of Bourbon Spanish America. By doing so, it then shares some basic characteristics with a small, albeit increasing, literature (e.g., Prados, 2006, 2009; Grafe and Irigoien, 2006; Irigoien, 2008, 2009, 2010; Dobado and García, 2009, 2010; Dobado and Marrero, 2011). This emergent revisionism departs from the very pessimistic judgment about the Spanish America's economic performance from conquest to independence that permeates mainstream scholarship.

⁵⁴ *'This article and other work in anthropometric history suggest that the poor nutrition of many native populations, including those rapidly conquered, has been overlooked.'* Steckel (2005, p. 29).

By studying wages of unskilled workers and physical statures in Bourbon Spanish America from an international comparative perspective, this paper attempts at widening the geographical scope –limited so far to Europe and Asia- of the ongoing debate on living standards and economic growth over the long run.

In general, contrary to Allen et al. (2011), our results do not support the idea of low living standards among wage earners in Bourbon Spanish America. Purchasing power of wages in Bourbon Spanish America -not only in terms of grain but also in those of superior goods (meat and sugar)- were similar or, not infrequently, higher than in many parts of the world, including most of Europe. Asian wages and living standards lagged behind the Spanish American ones. A declining trend in real wages at the end of the Bourbon period is observed in Spanish America as well as in Europe. These conclusions are basically consistent with the overall picture offered by our analysis of heights: Spanish Americans of the central decades of the eighteenth century enjoyed a relatively high biological living standard, except in South Eastern New Spain. This consistency is reassuring and results from an unusual double approach to living standards: complementing the study of wages with that of heights.

Our findings are relevant regarding a growing literature that finds colonial origins for some of the contemporary economic problems (slow growth and inequality) in Iberian America. As opposed to Asia, our international comparison of living standards suggests that the Great Divergence in important parts of Spanish America is mainly a post-independence phenomenon. In fact, results presented in this paper, as well as in Dobado and García (2009, 2010), cast some doubts on the accuracy of the GDPs per capita estimated by Coatsworth (2008) and Maddison (2009) for the late pre-independent period, which might be downward biased. Regarding inequality, neither this paper implies nor others (Coatsworth, 2005, 2008; Williamson, 2009; Dobado and García, 2009, 2010) claim that, in opposition to Engerman and Sokoloff (1994, 2002, 2005), it has colonial origins. Comparatively medium to high wages and biological living standards do not fit well with the idea of extreme inequality. Specially telling in this respect is the case of miners in New Spain and Upper Peru, supposedly the epitome of colonial exploitation.⁵⁵ The fact is that labour was not only, or mainly, obtained through ‘extractive institutions’, as posited by Acemoglu et al. (2002), but instead, during the Bourbon

⁵⁵ More details on labour conditions of New Spain miners in Dobado and Marrero (2011).

period, it increasingly resulted from an institution of 'private property' that did not exist before 1492: a market for wage labour.

The next step in our research consists of widening the database of wages, prices and heights in order to check whether our results prove to be robust to changes in the time and geographic scope of the sample. Further research is also needed to explain levels, trends and sub-continental differences in living standards in Spanish America before and after independence.

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Table 1. *Nominal and Real Wages by Early Nineteenth Century, selected locations.*

Grams of silver per day		Kilos of grain per day		Kilos of meat per day		Kilos of sugar per day	
Pennsylvania (1)	23,1	Pennsylvania (1)	17,9	Buenos Aires (1)	34,8	Pennsylvania (1)	3,7
Massachusetts (1)	20,4	Vermont (2)	12,8	Pennsylvania (1)	7,2	Massachusetts (1)	2,8
Massachusetts (2)	19,5	Bogota (1)	12,3	Vermont (2)	6,9	Massachusetts (2)	2,6
Potosi (6)	18,2	Potosi (6)	9,9	Guadalajara (1)	5,7	Mexico (1)	2,3
Maryland (2)	17,4	Guadalajara (1)	9,5	Mexico (1)	5,6	Bogota (1)	2,0
London (1)	17,2	Leipzig (1)	8,7	West Virginia (3)	5,6	New Spain (5)	1,5
Vermont (2)	14,1	Amsterdam (1)	7,9	Maryland (2)	5,4	London	1,4
West Virginia (3)	13,8	Guadalajara (2)	7,6	Massachusetts (1)	4,6	Vermont (2)	1,3
Potosi (1, 6)	12,1	Istanbul (1)	7,5	Guadalajara (2)	4,6	Buenos Aires (1)	1,1
Southern England (1)	12,1	London	7,4	Massachusetts (2)	4,4	Potosi (6)	1,0
Buenos Aires (1)	10,9	Mexico (1)	6,7	New Spain (5)	4,1	Southern England (1)	1,0
Guanajuato (6)	10,6	Potosi (1, 6)	6,6	Potosi (6)	4,1	Barcelona (1)	0,9
Chile (6)	9,6	Antwerp (1)	5,9	Bogota (1)	3,2	South England (2)	0,7
Amsterdam (1)	9,2	Palencia (1)	5,8	Amsterdam (1)	2,8	Potosi (1, 6)	0,7
Barcelona (1)	9,1	San Luis Potosi (1)	5,7	Potosi (1, 6)	2,7	Santiago de Chile (1)	0,6
Mexico (1)	9,1	New Spain (5)	5,6	London (1)	2,1	Antwerp (1)	0,5
Southern England (2)	8,6	Southern England (1)	5,4	Palencia (1)	1,5	Milan (1)	0,4
Guadalajara (1)	7,6	Barcelona (1)	5,2	Barcelona (1)	1,5	Calcutta (3)	0,4
New Spain (4)	7,1	Southern England (2)	5,2	Southern England (1)	1,5	Amsterdam (1)	0,4
Antwerp (1)	6,9	Gdansk (1)	3,6	Beijing (1)	1,3		
Palencia (1)	6,7	Calcutta (3)	3,1	Almaden (1)	1,1		
San Luis Potosi (3)	6,3	Buenos Aires (1)	3,0	Southern England (2)	1,0		
Guadalajara (2)	6,1	Almaden (1)	2,6	Vienna (1)	1,0		
Bogota (1)	6,1	Porto (1)	2,2	Milan (1)	0,7		
Santiago de Chile (1)	6,1	Vienna (1)	2,1				
New Spain (5)	6,0	Milan (1)	1,8				
Istanbul (1)	5,3	Kyoto (1)	1,6				
Porto (1)	5,1	Beijing (1)	1,6				
Gdansk (1)	4,8	Pune (3)	1,1				
Almaden (1)	4,8						
Leipzig (1)	4,1						
Beijing (1)	3,2						
Canton (1)	3,0						
Milan (1)	2,7						
Kyoto (1)	2,5						
Vienna (1)	2,4						
Pune (3)	1,3						
Calcutta (3)	1,1						

Legend: (1) urban; (2) rural; (3) unspecified; (4) lowlands; (5) highlands; (6) mining.

Source: See Appendix 1.

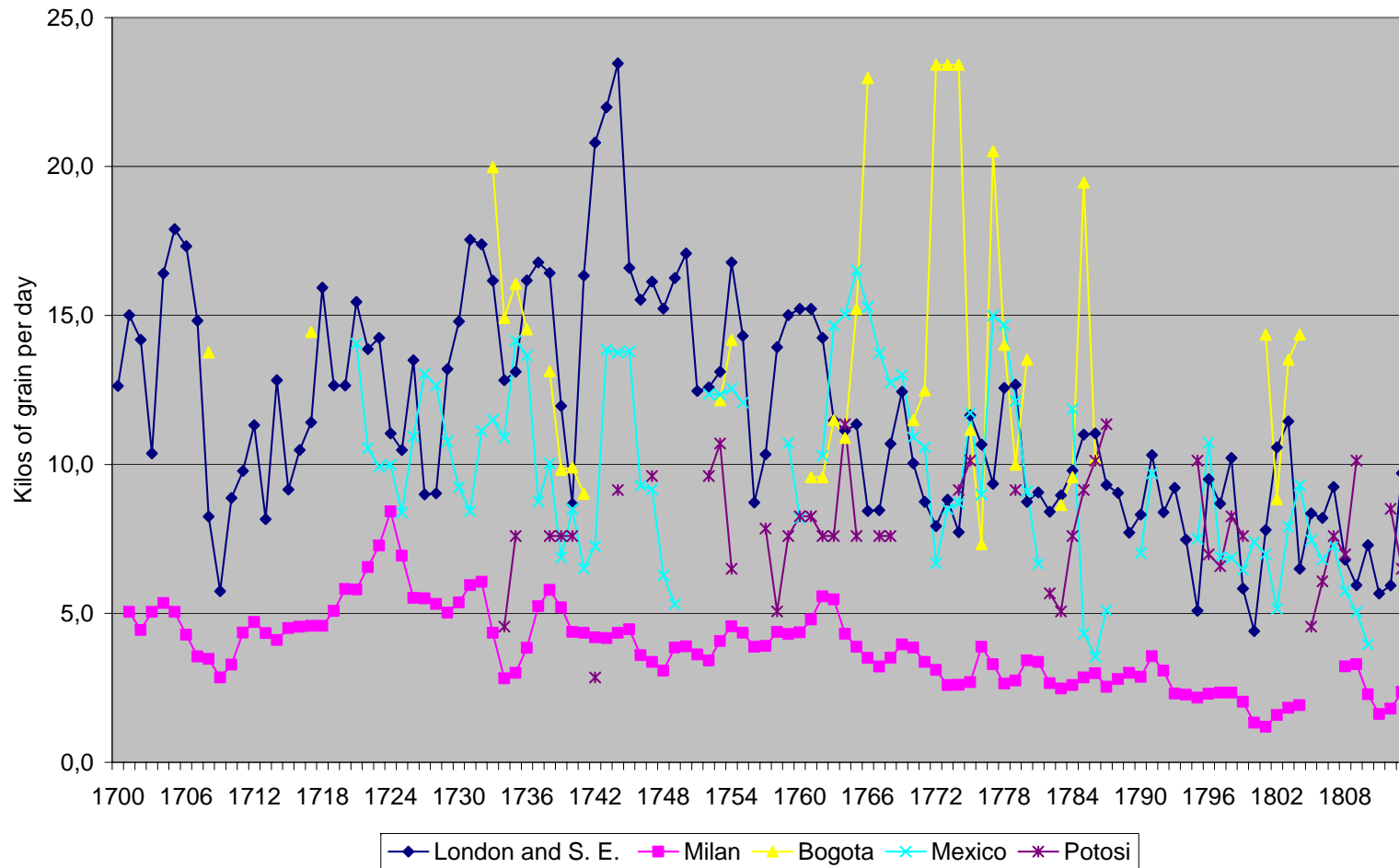
Table 2. *Adult Males Average Height in selected countries and regions*

(cohorts born from the 1730's to the 1840's)

	1730s	1740s	1750s	1760s	1770s	1800s	1830s	1840s
Argentina							171,0	169,5
Central México (Challú)		165,2	163,7	164,5	163,2	162,0	160,4	
Maracaibo "whites"	169,0	169,0	167,5	168,0				
Maracaibo "pardos"	162,7	164,7	166,0	166,5				
Mexico (López-Alonso)								166,5
México (Carson)								167,0
Northern New Spain	164,5	165,3	165,6	164,7	166,2			
Peru							163,0	162,5
South-Eastern New Spain "whites"		161,4	160,8	159,3				
South-Eastern Mexico "pardos"		157,0	158,0	159,0				
Bavaria	167,1	167,9	167,3	165,7	165,5		164,0	164,2
France	166,5	167,3	165,5	166,0		164	164,6	164,8
Indonesia (1770s-1790s)					157,4			
Interior Spain				163,5				162,8
Lombardy	167,7	168,3	166,4	166,1	165,3	164,5	164,1	
Russia	164,6	164,9	164,4	163,8	163,9	160,0		
Saxony	166,9	165,2	166,2	166,4	166,7	165,8	160,1	159,7
South-Eastern Spain			163,4	163,5	164,1			164,5
Sweden	168,4	169,4	168,2	167,4	167,0	167,8	167,9	168,0
UK (Cinnerella)		171,0	171,0	170,5	169,5	166,5	164,8	164,6
UK (Floud et al.)	171,4	165,8	167,0	169,0	168,5	171,5	168,2	167,5
UK (Komlos)		168,4	167,4	168,2	166,7	165,9	165,6	165,0
USA	172,1	172,1	172,2	172,5	172,8	172,9	173,5	172,2

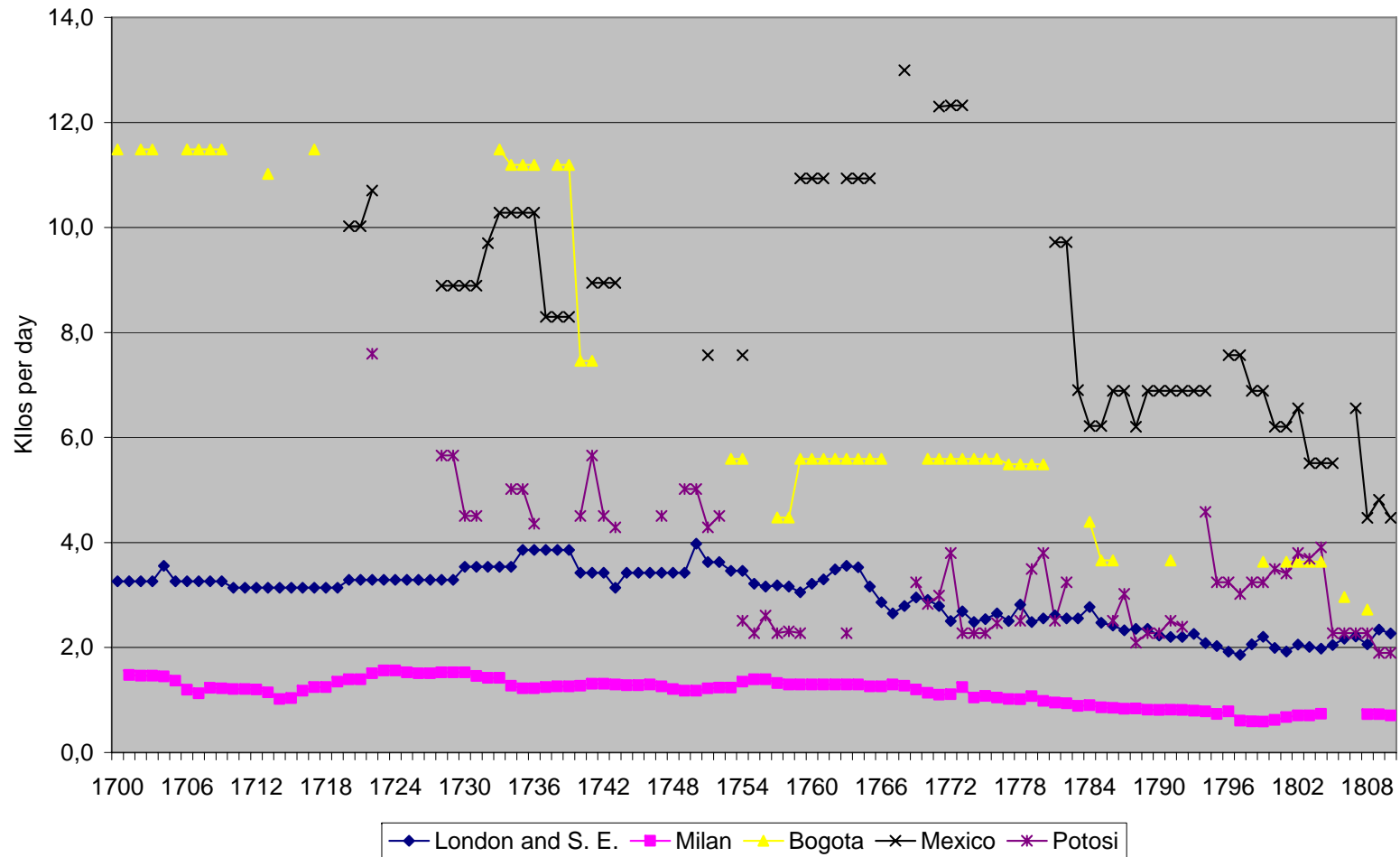
Source: See Appendix 2.

Figure 1. Grain Wages in London and Southern England, Milan, Bogota, Mexico and Potosi, 1700-1813.



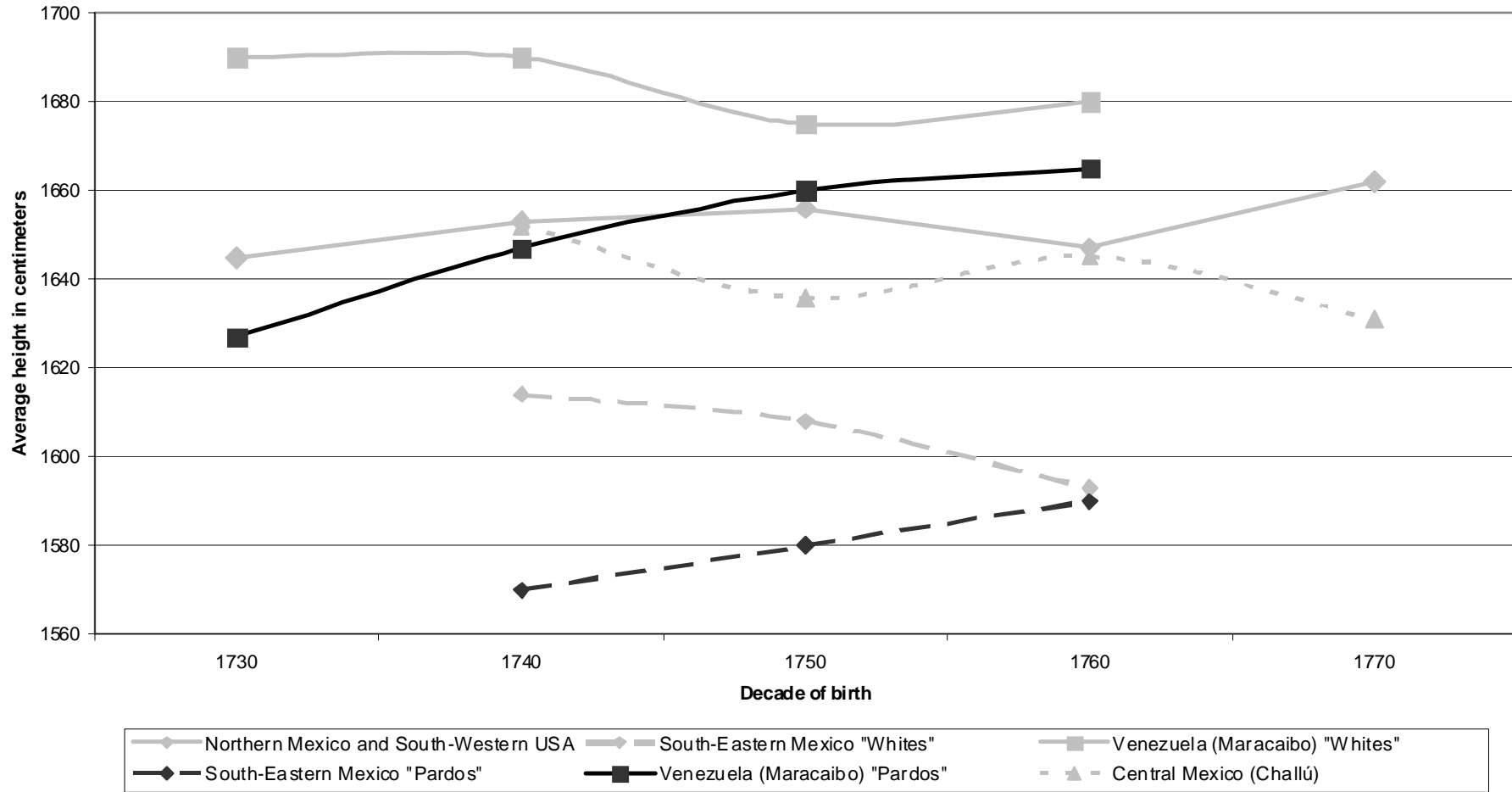
Source: See Appendix 1.

Figure 2. Meat Wages in London and Southern England, Milan, Bogota, Mexico and Potosi, 1700-1810.



Source: See Appendix 1.

Figure 3. Adult Male Average Height in Northern and South Eastern New Spain and Maracaibo, 1730s to 1770s.



Source: See Appendix 2.

Appendix 1: Sources, rates of conversion, and estimates procedures of wages and prices for 1800-1809.

Amsterdam: Wages of “*Opperman*” in grams of silver per day (IISH). Wheat prices are those of Amstersam for 1800-1804 and Utrecht-Groningen for 1805-1809 (IISH) in grams of silver per liter converted into kilos at the rate of 0,772 kilos per liter (GPIH). Meat (beef) prices estimated by taking those of the IISH for 1800 and 1811, as 1800 and 1809, respectively. Prices for 1801-1808 are the simple average of the two prices. Sugar prices are the one in guilders per pound for 1800 (IHS) converted into grams of silver at the rate of 0,464 grams per guider (IHS).

Antwerp: Wages of “*Mason's Labourer*” for 1800 and 1813 in grams of silver per day (IISH). Wheat prices are those in grams of silver per liter (IISH) converted into kilos at the rate of 0,772 kilos per liter (GPIHG). Sugar prices from 1803 and 1804 in grams of silver per kilo (IHS).

Barcelona: Wages of “*Peón de albañil*” (mason’s helper) for 1800-1802 and 1804-1806 in “*sueldos*” per day (Feliu, 1991) converted into grams of silver at the rate of 0.64 grams of silver per “*sueldo*” (Feliu, 1991). Wheat prices for 1800-1806 in “*sueldos*” per “*cuartera*” (Feliu, 1991) converted into kilos at the rate of 69.518 liter per “*cuartera*” (Feliu, 1991) and of 0,772 kilos per liter (GPIHG). Meat (mutton) prices for 1800-1807 (Feliu, 1991) in “*sueldos*” per “*libra carnicera*” (Feliu, 1991) converted into kilos at the rate of 1.2 kilos per “*libra carnicera*” (Feliu, 1991). Sugar prices for 1800-1803 and 1805-1808 in “*sueldos*” per “*arroba*” converted into kilos at the rate of 11.5 kilos per “*arroba*”. Wheat, meat and sugar prices in “*sueldos*” converted into grams of silver at the same rate as wages.

Beijing: Wages of “unskilled labourers” for 1800-1809 in grams of silver per day (GIHPG). Rices prices for 1800-1809 in grams of silver per kilo (GPIHG). Meat prices for 1800-1809 in grams of silver per kilo (GPIHG).

Bogota: Wages of “*Low skilled worker*” in “*reales de plata*” per day from 1700 to 1808 (GPIHG) converted into grams of silver at the rates taken from Burzio (1956-1958). Corn prices in grams of silver per kilo from 1717 to 1804 (GPIHG); missing observations are 1718-1732, 1737, 1742-1752, 1755-1760, 1767-1769, 1781-1782 and 1787-1800. Beef rices in grams of silver per kilo from 1700 to 1809; missing observations are 1701, 1704-1705, 1710-1712, 1714-1716, 1718-1732, 1737, 1742-1752, 1755-1756, 1767-1769, 1781-1783, 1787-1790, 1792-1797, 1800, 1805 and 1807. They have been converted into grams of silver at the rates taken from Burzio (1956-1958). Corn prices in grams of silver per kilo from 1721 to 1810 (GPIH); missing observations are 1750-1751, 1756-1758, 1761, 1782-1783, 1788-1789 and 1792-1794. Beef prices in grams of silver per kilo from 1720 to 1810; missing data are 1723-1727, 1740, 1744-1750, 1752-1753, 1755-1758, 1766-1767, 1769-1770, 1774-1780, 1795 and 1806. Sugar prices in

grams of silver per kilo from 1700 to 1807 (GPIHG); missing observations are 1701, 1703, 1712, 1716, 1733-1739, 1741-1752, 1754-1762, 1767-1771, 1781, 1787-1800 and 1805.

Buenos Aires: Wages of “*peones urbanos*” (urban laborers) for 1800-1809 in “*reales de plata*” per day (Johnson, 1990a). Wheat prices in “*reales de plata*” per “*fanega*” for 1800-1806 and 1809 (Johnson, 1990a) converted into grams of silver per kilo at the rate of 55.5 liters per “*fanega*” and of 0,772 kilos per liter (GPIHG). Beef prices in “*reales de plata*” per kilo for 1800-1809 estimated as the average of prices for 1798 and 1810 (Silveira, 2003) assuming 42.5 kilos per “*cuarto de res*”. Sugar prices in “*reales de plata*” per arroba of 11.5 kilos for 1800-1809 (Johnson, 1990a). Wages and prices in “*reales de plata*” converted into grams of silver at the rate taken from Burzio (1956-1858).

Calcutta: Wages of “*spinner*” for 1800-1809 in grams of silver per day (GPIHG). Rices prices for 1800-1809 in grams of silver per day (GPIHG). Sugar prices for 1800-1809 in grams of silveer per kilo.

Canton: Wages of “unskilled labourers” for 1800-1809 in grams of silver per day (GIHPG).

Chile: Monthly average wages of “*apiris*” (unskilled miner) in Norte Chico for 1790-1799 in “*pesos y reales de plata*” converted into grams of silver per day assuming twenty six labour days per month and no change in nominal terms during the early nineteenth century (Carmagnani, 1963, p. 83). Silver “*pesos*” and “*reales*” converted into grams of silver at the rate taken from Burzio (1956-1858).

Gdansk: Wages of “*Unskilled Worker*” for 1800-1809 in grams of silver per day (IISH). Wheat prices for 1800-1809 are those in grams of silver per liter (IISH) converted into kilos at the rate of 0,772 kilos per liter (GPIHG).

Guadalajara: Wages of “labourer” for 1804, 1806, 1807 and 1809 in “*reales de plata*” per day (Van Young, 1981; Challú, unpublished). Wages of rural labourers during the eighteenth century (Van Young, 1981). Corn prices for 1800-1809 in “*reales de plata*” per “*fanega*” (Challú, unpublished) converted into grams of silver per kilo at the rates of 55.5 liters per “*fanega*” and 0,772 kilos per liter (GPIHG). Meat prices in “*reales de plata*” per kilo (Van Young, 1981). Conversion rates from “*reales de plata*” to silver grams from Burzio (1956-1958).

Istambul: Wages of “unskilled” labourer (GPIHG) for 1800, 1802, 1805, 1807 and 1809 in grams of silver per day. Wheat prices in grams of silver per kilo for 1801, 1803-1805 and 1807-1808 (GPIHG).

Kyoto: Wages of “*unskilled laborers*” in grams of silver per day and rice prices in grams of silver per kilo (Bassino and Ma, 2006).

Leipzig: Wages of “*Unskilled Worker*” for 1800-1809 in grams of silver per day (IISH). Wheat prices for 1800-1809 are those in grams of silver per liter (IISH) converted into kilos at the rate of 0,772 kilos per liter (GPIHG).

London and Southern England: Wages of building labourers in London and Southern England and of agricultural labourers in southern England in grams of silver per day from 1700-1810 (IISH). Wheat prices in silver grams per liter from 1700 to 1810 (ISH) converted into kilos at the rate of 0,772 kilos per liter (GPIHG). Beef prices in grams of silver per kilo from 1700 to 1810 (IISH). Sugar prices in grams of silver per kilo from 1700 to 1810 (IISH).

Maryland: Brandywine “*farm laborers*” for 1800-1809 in grams of silver per day (GIPHG).

Massachussets: Annual average wages of “*agricultural laborer*” and “*laborers*” 1801-1810 in grams of silver per day (GIPHG). Beef prices for 1802-1809 in grams of silver per kilo (GIHP). Sugar prices for 1800-1805 and 1808 in grams of silver per kilo (GIHP).

Mexico: Wages in “*reales de plata*” per day of unskilled construction workers 1719, 1732-1738, 1752, 1754, 1756, 1764 and 1767 (GPIHG), 1807-1808 (Palacio de la Minería, ML 322B) and 1809-1810 (Challú, unpublished). Wages in 1720-1731 as in 1719, 1739-1751 as in 1732-1738, in 1753 as in 1752, 1753 as in 1752, 1755 as in 1755, 1757-1763 as in 1756, 1765-1766 as in 1764 and 1768-1807 as in 1767. They have been converted into grams of silver at the rates taken from Burzio (1956-1858). Corn prices in grams of silver per kilo from 1721 to 1810 (GPIHG); missing data are 1750-1751, 1756-1758, 1761, 1782-1783, 1788-1789 and 1792-1794. Beef prices in grams of silver per kilo from 1720 to 1810; missing observations are 1723-1727, 1740, 1744-1750, 1752-1753, 1755-1758, 1766-1767, 1769-1770, 1774-1780, 1795 and 1806.

Milan: Wages of construction labourer in grams of silver per day from 1701 to 1810 (IISH); missing observations are 1805-1807. Wheat prices in silver grams per liter from 1701 to 1810 (ISH) converted into kilos at the rates of 0,772 kilos per liter (GPIHG); missing observations are 1805-1807. Veal prices in grams of silver per kilo from 1701 to 1810 (IISH); missing observations are 1805-1807. Sugar prices in grams of silver per kilo from 1701 to 1810 (IISH); missing observations are 1800-1802 and 1804-1807.

New Spain: Wages of unskilled agricultural labourers in *reales de plata* per day in “*regiones frías*” (highlands) y “*calientes*” (lowlands) by early nineteenth century (Humboldt, 1822:1991, p. 264). Conversion rates from “*reales de plata*” to silver grams from Burzio (1956-1958). Prices used for estimating real wages are those of Mexico.

Palencia: Wages of “*braceros*” (unskilled construction labourers) for 1800-1802 and 1804-1809 in *reales de vellón* per day (Moreno, 2001) converted into grams of silver at the rate (1.2 grams of silver per *real*) of 1800 (Hamilton, 1988). Wheat prices in “*reales de vellón*” per “*fanega*” converted into grams of silver per kilo at the rates of 55.5 liters per “*fanega*” and 0,772 kilos per liter (GPIHG). Meat (mutton) prices 1800-1801, 1803-1806 and 1808-1809 in “*reales de vellón*” per kilo. Wheat and meat prices in “*reales de vellón*” converted into grams of silver at the same rate as wages.

Pennsylvania: Wage of “*labourers*” 1800-1809 in grams of silver per day (GIPHG). Wheat prices for 1800-1809 in grams of silver per kilo (GIHP). Beef prices for 1800-1809 in grams of silver per kilo (GIHP). Sugar prices for 1800-1809 in grams of silver per kilo (GIHP).

Porto: Wages of unspecified workers in grams of silver per day for 1800-1809 (GPIHG). Prices of wheat in grams of silver per kilo for 1800-1809 (GIPH).

Potosí: Daily wage of “*peón*” (unskilled laborer) for 1716-1813 assuming no change in nominal terms (GPIHG). Corn prices for 1734-1735, 1738-1740, 1742, 1744, 1747, 1752-1754, 1757-1765, 1767-1768, 1774-1775, 1779, 1782-1787, 1795-1799, 1805-1809 and 1812-1813 and wheat prices for 1720, 1726-1727, 1731, 1737, 1743, 1745-1757, 1759-1765, 1769-1771, 1773, 1775-1776, 1778-1800, 1806-1808, 1810 and 1812 in grams of silver per kilo (GPIHG). Beef prices in “*reales de plata*” per “*cuarto*” (Tandeter and Wachtel, 1983) for 1703-1710, 1709-1710, 1722, 1728-1731, 1734-1737, 1740-1743, 1747, 1749-1752, 1754-1759, 1763, 1769-1777, 1778-1782, 1786-1792 and 1794-1813 converted into grams of silver per kilo assuming 11.5 kilos per “*cuarto*”. Sugar prices in “*reales de plata*” per “*arroba*” of 11.5 kilos (Tandeter and Wachtel, 1983) for 1720-1731, 1734-1782 and 1784-1813 converted into grams of silver per kilo. Rates of conversion from “*reales de plata*” into silver grams from Burzio (1956-1958). Daily wages of *mitayos* and unskilled free miners by early nineteenth century in “*reales de plata*” assuming no change in nominal terms since the 1790’s (Tandeter, 1992, pp. 76 and 114, respectively).

Pune: Wages of “unskilled labour” for 1805-1809 in grams of silver per day (GPIHG). Rice prices for 1800-1809 in grams of silver per kilo (GPIHG).

San Luis Potosi: Wages of “*labourer*” for 1800-1803, 1806 and 1808-1809 in “*reales de plata*” per day (Challú, unpublished). Corn prices for 1800-1809 in “*reales de plata*” per “*fanega*” (Challú, unpublished) converted into grams of silver per kilo at the rate of 55.5 liters per “*fanega*” and of 0,772 kilos per liter (GPIHG). Conversion rates from “*reales de plata*” to silver grams from Burzio (1956-1958).

Santiago de Chile: Wages of “*peones*” (unskilled construction workers) in “*reales de plata*” per day for 1800-1805 from Quiroz (2009) converted into grams of silver at the rate taken from Burzio (1956-1958). Sugar prices for 1800, 1803 and 1805-1808.

Strasbourg: Wages of “*Unskilled Worker*” for 1801-1809 in grams of silver per day (IISH). Wheat prices for 1800-1809 are those in grams of silver per liter (IISH) converted into kilos at the rate of 0,772 kilos per liter (GPIHG).

Vermont: “*Farm wages with board*” for 1800-1809 in grams of silver per day (GPIHG). Wheat prices “*received by producers*” for 1800-1809 in grams of silver per kilo (GIPHG). Beef prices “*received by producers*” for 1800-1809 in grams of silver per kilo (GIPHG). Sugar “*retail prices paid by farmers*” for 1801-1809 in grams of silver per kilo (GIPHG).

Vienna: Wages of “*Mason’s Handyman*” for 1800-1809 in grams of silver per day (IISH) is the average of 1800 and 1821. Wheat prices for 1800-1809 are those in grams of silver per liter (IISH) converted into kilos at the rate of 0,772 kilos per liter (GPIHG).

Appendix 2:

Primary sources of heights in New Spain and Venezuela (Maracaibo): Archivo General de Simancas, Simancas, Valladolid, Spain. Secretaría del Despacho de la Guerra, files 7299-2, 7299-3, 7299-4, 7299-5, 7299-6, 7198-18, 7198-2, 7028-7, 7029-1, 7034-1, 7027-12, 7026-1, 7048-5, 6991-2, 7025-2, 7047-9, 7047-10, 7047-11, 7047-13, 7047-14, 7047-15, 7047-16, 7047-17, 7047-18, 7047-19, 7047-20, 7047-21, 7047-22, 7047-23, 7047-24, 7047-25, 7047-27, 7047-29, 7048-2, 7048-3, 7048-4, 7048-6, 7048-7.

Sources for other countries in Table 2: Argentina, Baten (2010); Central México, Challú (2009); México, López-Alonso (2010) and Carson (2005, 2007); Perú, Baten et al. (2009) and Twrdek and Manzel (2010); Bavaria, Baten (2001) and Lantzsck and Schuster (2009); France, Komlos et al. (2003) and Weir (1997); Indonesia, Baten, Stejl and van der Eng (2010); Lombardy, A’Hearn (2003); Russia, Mironov (2005); Saxony, Cinnirella (2008a); Interior Spain, García-Montero (2009, 2010); South-Eastern Spain: Cámara (2009); Sweden, Heintel et al. (1998) and Sandberg and Steckel (1997); UK, Floud et al. (1990), Komlos (1993) and Cinnirella (2008b); USA, Steckel (1994).

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