J. Lat. Amer. Stud. **46**, 291–321 © Cambridge University Press 2014
doi:10.1017/S0022216X14000054

Neither So Low nor So Short: Wages and Heights in Bourbon 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 a pioneering study of both wages and heights. Wages were not low, nor were heights short, by the international standards of the period. The living standards of Spanish Americans thus compare favourably with those of other regions of the world, including Europe. As in many parts of the West, one can observe a trend towards the deterioration of real wages 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 independence and that currently available GDP per capita estimates might be too low.

Keywords: living standards, wages, heights, Bourbon America, anthropometric history

Introduction

Scholarly interest in real wages in the past has recently revived, due in large part to the research agenda established by Jean-Luiten van Zanden and

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* This research was made possible by a grant from the Spanish Ministry of Science and Innovation (ECO2008-01989/ECON) and a Tinker Professorship at Columbia University held by Rafael Dobado in 2010. We acknowledge comments and criticisms made by the editors of the *JLAS*, the three anonymous referees, Andrés Calderón and participants in various conferences: 'A Comparative Approach to Inequality and Development: Latin America and Europe' (Madrid, May 2009); Session E5 ('Latin America Economic Backwardness Revisited: New Empirical Contributions') at the XVth World Economic History Congress (Utrecht, 2009); a panel on Anthropometry and Health at the 2009 Economic History Association Meeting (Tucson, AZ); and a conference on 'New Frontiers in Latin America Economic History' at Columbia University (New York, 2010). The usual disclaimer applies.

Robert Allen.[1] This trend has been reinforced by significant contributions from a number of scholars.[2] Curiously enough, however, Spanish America does not yet have a presence in this literature that accords with its historical relevance either in the global picture of real wages or in the 'Great Divergence' debate.[3]

[1] See, for example, Jan Luiten van Zanden, 'Wages and the Standard of Living in Europe, 1500–1800', *European Review of Economic History*, 3: 2 (1999), pp. 175–98; and 'The "Revolt of the Early Modernists" and the "First Modern Economy": An Assessment', *Economic History Review*, 55: 4 (2002), pp. 619–41; and Robert C. Allen, 'The Great Divergence in European Wages and Prices from the Middle Ages to the First World War', *Explorations in Economic History*, 38: 4 (2001), pp. 411–47; 'Real Wages in Europe and Asia: A First Look at the Long-Term Patterns', in Robert C. Allen, Tommy Bengtsson and Martin Dribe (eds.), *Living Standards in the Past: New Perspectives on Well-Being in Asia and Europe* (Oxford: Oxford University Press, 2005), pp. 111–30; and 'Real Wage Rates (Historical Trends)', in Steven N. Durlauf and Lawrence E. Blume (eds.), *New Palgrave Dictionary of Economics* (2nd edition, New York: Palgrave Macmillan, 2008).

[2] See, for example, Süleyman Özmucur and Şevket Pamuk, 'Real Wages and Standards of Living in the Ottoman Empire, 1469–1914', *Journal of Economic History*, 62: 2 (2002), pp. 293–321; Stephen Broadberry and Bishnupriya Gupta, 'The Early Modern Great Divergence: Wages, Prices and Economic Development in Europe and Asia, 1500–1800', *Economic History Review*, 59: 1 (2006), pp. 2–31; Paolo Malanima, 'Wages, Productivity and Working Time in Italy, 1300–1913', *Journal of European Economic History*, 36: 1 (2007), pp. 127–74; Şevket Pamuk and Jan Luiten van Zanden, 'Standards of Living', in Stephen Broadberry and Kevin H. O'Rourke (eds.), *Cambridge Economic History of Modern Europe,* vol. 1: *1700–1870* (Cambridge: Cambridge University Press, 2010), pp. 217–34.

[3] To the best of our knowledge, only the following monographs and edited volumes offer significant information and insights: Marcelo Carmagnani, *El asalariado minero en Chile colonial* (Santiago: Universidad de Chile, 1963); Eric van Young, *Hacienda and Market in Eighteenth Century Mexico* (Berkeley, CA: University of California Press, 1981); Enrique Tandeter and Nathal Wachtel, *Precios y producción agraria: Potosí y Charcas en el siglo XVIII* (Buenos Aires: CEDES, 1983); Cuauhtémoc Velasco, 'Los trabajadores mineros en la Nueva España, 1750–1810', in Enrique Cárdenas (ed.), *Historia económica de México* (Mexico City: Fondo de Cultura Económica, 1989), pp. 563–89; Lyman L. Johnson, 'Salarios, precios y costo de la vida en el Buenos Aires colonial tardío', *Boletín del Instituto de Historia Argentina y Americana Dr. E. Ravignani*, 3rd series, 2 (1990), pp. 133–57; 'The Price History of Buenos Aires during the Viceregal Period', in Lyman L. Johnson and Enrique Tandeter (eds.), *Essays on the Price History of Eighteenth-Century Latin America* (Albuquerque, NM: University of New Mexico Press, 1990), pp. 137–72; and 'La historia de precios de Buenos Aires durante el período virreinal', in Johnson and Tandeter (eds.), *Economias coloniales: precios y salarios en America Latina siglo XVIII* (Buenos Aires: Fondo de Cultura Económica, 1992), pp. 153–90; Enriqueta Quiroz, 'Salarios y condiciones de vida en Santiago de Chile, 1790–1805', in Enriqueta Quiroz (ed.), *Condiciones de vida y de trabajo en la América colonial: legislación, prácticas laborales y sistemas salariales* (Bogotá: Universidad de los Andes, 2009), pp. 211–64; and Ricardo D. Salvatore, John H. Coatsworth and Amílcar E. Challú (eds.), *Living Standards in Latin American History: Height, Welfare, and Development, 1750–2000* (Cambridge, MA: Harvard University Press, 2010). Scattered and fragmentary evidence is less scarce: see, for example, Charles Gibson, *Los aztecas bajo el dominio español, 1519–1810* (Buenos Aires: Siglo XXI, 1967); Alexander von Humboldt, *Ensayo político sobre el reino de la Nueva España* (Mexico City: Porrúa, 1991 [1822]); David A. Brading, *Mineros y comerciantes en el México borbónico, 1763–1810* (Mexico City: Fondo de Cultura Económica, 1983); and Doris M. Ladd, *Génesis y desarrollo de una huelga: las luchas de los mineros mexicanos de la plata en Real del Monte* (Mexico City: Alianza, 1992).

Hence, the main goal of this paper is to contribute to the opening of the 'black box' represented by living standards in Bourbon America. We thus study wages over the eighteenth and early nineteenth centuries.[4]

Our interest in analysing labourers' living standards also responds to the influential ideas of Stanley Engerman and Kenneth Sokoloff, and Daron Acemoğlu et al.[5] They jointly offer an image of early modern Latin America's institutional framework as based on 'extractive' institutions intended 'to force the local population to work in mines and plantations', and resulting in extreme 'inequality in wealth and human capital [that] came to characterize much of Spanish America'.[6] 'Extractive' institutions and high inequality would be detrimental for economic growth and therefore explain the 'reversal of fortune' and the 'divergent paths of development' that divided the destiny of the former European colonies in America into basically two groups: the United States and Canada versus the rest.[7]

Studying the living standards of commoners in Bourbon America proves to be an appropriate test for these neo-institutional hypotheses. One of the

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Rafael Dobado-González and Héctor García-Montero, 'Colonial Origins of Inequality in Hispanic America? Some Reflections Based on New Empirical Evidence', *Revista de Historia Económica/Journal of Iberian and Latin American Economic History*, 28: 2 (2010), pp. 253–77, employs both primary and secondary sources. The latter alone are used in Rafael Dobado-González, 'Prices and Wages in Bourbon Mexico from an International Comparative Perspective', in José Morilla, Juan Hernández Andreu, José L. García-Ruiz and José M. Ortiz-Villajos (eds.), *Homenaje a Gabriel Tortella: las claves del desarrollo económico y social* (Madrid: LID/Universidad de Alcalá, 2010), pp. 85–102; Robert C. Allen, Tommy E. Murphy and Eric B. Schneider, 'The Colonial Origins of the Divergence in the Americas: A Labour Market Approach', *Journal of Economic History*, 72: 4 (2012), pp. 863–94; and Leticia Arroyo Abad, Elwyn Davies and Jan Luiten van Zanden, 'Between Conquest and Independence: Real Wages and Demographic Change in Spanish America, 1530–1820', *Explorations in Economic History*, 49: 2 (2012), pp. 149–66.

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

[5] Stanley L. Engerman and Kenneth L. Sokoloff, 'Factor Endowments, Institutions, and Differential Paths of Growth among New World Economies: A View from Economic Historians of the United States', NBER Working Paper no. h0066 (1994); 'Factor Endowments, Inequality, and Paths of Development among New World Economics', NBER Working Paper no. w9259 (2002); and 'Colonialism, Inequality, and Long-Run Paths of Development', NBER Working Paper no. w11057 (2005). Daron Acemoğlu, Simon Johnson and James A. Robinson, 'Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution', *Quarterly Journal of Economics*, 117: 4 (2002), pp. 1231–94.

[6] *Ibid*., p. 1279; Engerman and Sokoloff, 'Colonialism, Inequality', p. 4.

[7] Quotes are from Acemoğlu, Johnson and Robinson, 'Reversal of Fortune'; and Engerman and Sokoloff, 'Colonialism, Inequality', respectively.

goals of this paper consists of assessing the consistency between the available empirical evidence and the pessimistic inferences about living standards which are logically derived from a view based on the notions of intense labour extraction and extreme inequality.

Mainstream views on living standards in Bourbon America tend to underestimate the importance of wage labour. Lyman 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 the service sector and in mining from the mid seventeenth century.'[8]

This lack of attention is most surprising with regard to mining, since it was a leading economic activity in the principal territories of the Spanish monarchy in America (in the Andes and New Spain) and was dominated by forced labour much less than is commonly assumed.[9] It is also probably not generally recognised that Spanish America was a relatively urbanised region by the international standards of the pre-industrial era, especially in those areas that played central roles in the empire politically or economically. Cities were, in the words of Susan Socolow and Lyman Johnson, 'clearly a pivotal factor in the development of colonial Latin America'.[10] By 1800, according to Paul Bairoch, 'it was the most urbanised continent'.[11]

Wage labour was also present, more commonly than is generally supposed, in rural areas.[12] A labour market appeared soon after the conquest.[13] Even those authors that emphasise the extension over time and space of varied forms of coerced labour (*encomienda, repartimiento, mita* and debt peonage) acknowledge their coexistence with wage labour and its increasing role as an effective means for recruiting workers.[14] Moreover, the payment of wages was so widespread in Spanish America after the second half of the sixteenth

[8] Lyman L. Johnson, 'The Development of Slave and Free Labor Regimes in Late Colonial Buenos Aires, 1770–1815', Latin American Studies Consortium of New England, Occasional Paper no. 9 (1997), p. 1.

[9] Peter J. Bakewell, *Silver Mining and Society in Colonial Mexico: Zacatecas, 1546–1700* (Cambridge: Cambridge University Press, 1971); *Mineros de la Montaña Roja: el trabajo de los indios en Potosí, 1545–1650* (Madrid: Alianza, 1989); and *A History of Latin America* (Malden, MA: Blackwell, 2004).

[10] Susan M. Socolow and Lyman L. Johnson, 'Urbanization in Colonial Latin America', *Journal of Urban History*, 8: 1 (1981), p. 51.

[11] Paul Bairoch, *De Jéricho á Mexico: villes et économie dans l'histoire* (Paris: Gallimard, 1985), p. 498, authors' translation.

[12] John M. Monteiro, 'Labor System', in Víctor Bulmer-Thomas, John H. Coatsworth and Roberto Cortés (eds.), *Cambridge Economic History of Latin America*, vol. 1 (Cambridge: Cambridge University Press, 2006), pp. 395–422.

[13] John H. Coatsworth, 'Political Economy and Economic Organization', in Bulmer-Thomas, Coatsworth and Cortés (eds.), *Cambridge Economic History of Latin America*, p. 265.

[14] Benjamin Keen and Keith Haynes, *A History of Latin America* (8th edition, Belmont, CA: Wadsworth, 2008).

century as to become an inseparable part of most forms of coerced labour, whether by law or by everyday practice. Wages were used by some employers 'to lure indigenous workers away from the employers to whom they had been assigned by *repartimiento*'.[15] Around 1800, wage labour was important even in plantation zones,[16] and was probably dominant in the Spanish American economy as a whole as a result of a long evolutionary process leading from bondage to market forces.[17]

It is very often forgotten that markets for factors – land, labour and capital – appeared in America precisely after 1492, since they were non-existent in pre-Columbian economies. Certainly, 'extractive institutions' did exist in Bourbon America, but they were neither ubiquitous nor permanent in the centuries between conquest and independence. On the contrary, they always functioned alongside, and interacted with, genuine 'institutions of private property', not to mention those of communitarian character.[18] While the 'private property' institutions – in other words, labour markets – expanded increasingly 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 significantly different from that of the late sixteenth century. Thus, wages also matter for a proper understanding of the economic history of this region of the world.

An important novelty of our approach to living standards is that it consists of studying not only wages but also heights. This biological measure of welfare

[15] Coatsworth, 'Political Economy and Economic Organization', p. 264.

[16] Johnson, 'The Development of Slave and Free Labor Regimes', p. 2.

[17] Monteiro, 'Labor System', p. 232. The number of encomiendas in most of Spanish America declined after 1575: Timothy J. Yeager, 'Encomienda or Slavery? The Spanish Crown's Choice of Labor Organization in Sixteenth-Century Spanish America', *Journal of Economic History*, 55: 4 (1995), pp. 842–59. By 1790 they had disappeared. The 1650s 'marked the end of the great period of massive slave importations' in New Spain and Peru, according to Herbert S. Klein, *The Atlantic Slave Trade* (Cambridge: Cambridge University Press, 2007), p. 26. Repartimientos in New Spain were abolished, with some exceptions, in 1631: Andrés Lira and Luis Muro, 'El siglo de la integración', in Daniel Cosío Villegas (ed.), *Historia general de México*, vol. 1 (Mexico City: El Colegio de México, 2002), p. 337. Mita was far from universal in Andean mining, according to Bakewell, *A History of Latin America*, p. 240.

[18] *Mitayos* in Potosí were paid four reales de plata (more than 12 grams of silver) per working day: see Enrique Tandeter, *Coacción y mercado: la minería de la plata en el Potosí colonial, 1692–1826* (Cusco: Centro de Estudios Regionales Andinos Bartolomé de las Casas, 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) in 1603–10 and at 2 reales (6.2 grams of silver) in 1629: Gibson, *Los aztecas bajo el dominio español*, p. 255. Most of the arable land in Mesoamerica and the Andes was owned by 'indigenous peasants and their communities until long after independence', according to John H. Coatsworth, 'Inequality, Institutions and Economic Growth in Latin America', *Journal of Latin American Studies*, 40: 3 (2008), p. 556.

has gained acceptance among social scientists over recent decades. Nonetheless, evidence on the eighteenth and early nineteenth centuries is scarce for Spanish America.[19] Thus it is clearly necessary to widen our knowledge on the levels and the trends in height in pre-independence Spanish America and, by doing so, to fill a gap in information compared with other parts of the world. To do this, we have built a relatively large database of heights.

When the black box of both economic and biological living standards is opened, even if partially, it turns out that wages (nominal or real) were not so low and heights were not so short as to support the pessimistic view embodied in the neo-institutional literature. A first 'optimistic' revision of mainstream views on economic and biological welfare in Bourbon America appeared in our earlier work.[20] However, Allen at al. later argued that 'the Latin American colonies [were] among the least developed countries'.[21] This difference in views responds mainly to the distinct methodological approach chosen by these authors, as the discussion in the next section will show. More recently, optimism has been, at least to some extent, shared by Arroyo et al.[22] They basically follow Allen's methodology, albeit with some changes in the basket of consumption which explain why their results are not inconsistent

[19] Amílcar E. Challú, 'Agricultural Crisis and Biological Well-Being in Mexico, 1730–1835', *Historia Agraria*, 47 (2009), pp. 21–44; and 'The Great Decline: Biological Well-Being and Living Standards in Mexico, 1730–1840', in Salvatore et al., *Living Standards in Latin American History*, pp. 23–67; Agustín Grajales-Porras and Moramay López-Alonso, 'Physical Stature of Men in Eighteenth-Century México: Evidence from Puebla', *Economics and Human Biology*, 9: 3 (2011), pp. 265–71; Ricardo D. Salvatore and Joerg Baten, 'A Most Difficult Case of Estimation: Argentinian Heights, 1770–1840', in John Komlos and Joerg Baten (eds.), *The Biological Standard of Living in Comparative Perspective* (Stuttgart: Franz Steiner Verlag, 1998), pp. 90–6; Ricardo D. Salvatore, 'Heights and Welfare in Late-Colonial and Post-Independence Argentina', in Komlos and Baten (eds.), *The Biological Standard of Living in Comparative Perspective*, pp. 97–121; Joerg Baten, 'Argentina's Early Anthropometric History, 1820–1860s', unpubl. working paper, University of Tübingen, 2010.

[20] 'If real wages and heights may also be considered acceptable indicators of living standards and economic development, the picture of Bourbon Hispanic America becomes less pessimistic than the one usually assumed by most economists and economic historians': Rafael Dobado-González and Héctor García-Montero, 'Neither So Low nor So Short! Wages and Heights in Eighteenth and Early Nineteenth Centuries Colonial Latin America', paper presented at the mini-conference 'A Comparative Approach to Inequality and Development: Latin America and Europe', Instituto Figuerola de Historia Económica and Fundación Ramón Areces, Madrid, 2009, p. 8.

[21] Allen, Murphy and Schneider, 'The Colonial Origins of the Divergence', p. 1.

[22] 'The real wage estimates presented here suggest that living standards may have increased substantially, a change that is quite clear for Mexico ... But the standards of living of free wage labourers in Potosi, of construction workers in 18th century Buenos Aires, and, to a much lesser extent, of Chilean miners in the same period, were also relatively high, and compared favourably with real wages of large parts of Western Europe. Real wages in Peru and Colombia, on the other hand, were not particularly high before the 1720s': Arroyo Abad, Davies and van Zanden, 'Between Conquest and Independence', p. 160.

with those previously obtained by us. Neither Allen et al. nor Arroyo et al. analyse biological welfare.

Our international comparative approach suggests that, in terms of living standards, the 'Great Divergence' in some parts of Spanish America owes much to post-independence developments. From this it follows that currently available estimates of GDP per capita for most developed territories in Spanish America by the early nineteenth century might be biased downwards.[23] Some indications of this could already be inferred from the initial exploration of the issue undertaken in our earlier work.[24] This conclusion seems to have been accepted in toto by Arroyo et al.[25]

It is therefore our contention that important aspects of the mainstream, 'pessimistic' view of 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.[26]

Whether our alternative, rather optimistic view, even though it should be treated as conditional because of the inter-territorial heterogeneity that characterised Spanish America, turns out to be robust to the extension of the sample in terms of time and space or to changes in methodology remains to be

[23] This comment refers to the estimates presented in Coatsworth, 'Inequality, Institutions and Economic Growth'; Angus Maddison, 'Statistics on World Population, GDP and Per Capita GDP, 1–2006 AD' (2009), available at www.ggdc.net/maddison/; and Leandro Prados de la Escosura, 'Lost Decades? Economic Performance in Post-Independence Latin America', *Journal of Latin American Studies*, 41: 2 (2009), pp. 279–307.

[24] 'On the other hand, calculating ratios of heights and real wages to GDP per capita estimates ... for 1820 converts Hispanic America into a clear outlier within a wide sample of countries. This finding suggests that available estimations on Bourbon Hispanic America GDP per capita should be revised upwards.' Dobado-González and García-Montero, 'Neither So Low nor So Short!', p. 2.

[25] 'They strongly suggest GDP per capita has developed differently than estimated by Maddison ... in his pioneering research, and that the starting level at the eve of the 19th century may have been higher than assumed so far': Arroyo Abad, Davies and van Zanden, 'Between Conquest and Independence', p. 160.

[26] Leandro Prados de la Escosura, 'Inequality and Poverty in Latin America: A Long-Run Exploration', in Timothy J. Hatton, Kevin H. O'Rourke and Alan M. Taylor (eds.), *The New Comparative Economic History: Essays in Honor of Jeffrey G. Williamson* (Cambridge, MA: MIT Press, 2007), pp. 291–315; and 'Lost Decades?', pp. 279–307; Regina Grafe and Alejandra Irigoin, 'The Spanish Empire and its Legacy: Fiscal Redistribution and Political Conflict in Colonial and Post-Colonial Latin America', *Journal of Global History*, 1: 2 (2006), pp. 241–67; Alejandra Irigoin, 'Bargaining for Absolutism: A Spanish Path to Nation-State and Empire Building', *Hispanic American Historical Review*, 88: 2 (2008), pp. 173–209; 'Gresham on Horseback: The Monetary Roots of Spanish American Political Fragmentation in the Nineteenth Century', *Economic History Review*, 62: 3 (2009), pp. 551–75; Dobado-González and García-Montero, 'Neither So Low nor So Short!' and 'Colonial Origins of Inequality'; Rafael Dobado and Gustavo Marrero, 'The Role of the Imperial State in the Mining-Led Growth of Bourbon Mexico's Economy', *Economic History Review*, 64: 3 (2011), pp. 855–84.

seen. Nonetheless, the evidence presented in this paper seems to be far from insubstantial or irrelevant.

Wages

In this section, wages of unskilled workers (mostly urban and agricultural labourers) are presented first in terms of grams of silver per working day. Using unskilled workers' wages to study living standards has become conventional in the literature, and besides, it responds to the (unproven) assumption of extreme inequality in Spanish America. Thus only the least privileged wage earners are considered: this excludes slaves but not other forms of coerced labour, such as *mitayos* in Potosí. We proceed by analysing real wages, which are defined as the purchasing power parity of silver wages in terms of the most popular grain and meat consumed by commoners (corn and beef in New Spain, wheat and mutton in Istanbul, rice in Asia and so on). We have also estimated the purchasing power of wages in terms of a colonial good: sugar. Using these three products permits us 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 hardly present in their daily diet; sugar was even rarer and might be considered a delicacy. Our approach, then, estimates the purchasing power of wages in terms of calories, proteins and luxury goods. We present these estimates both synchronically, extending the comparison between a number of Spanish American cases and the rest of the world at the beginning of the nineteenth century as widely as possible, and then diachronically, showing their evolution in Bogotá, Mexico City and Potosí throughout the eighteenth century alongside those at the top (London and southern England) and the bottom (Milan) of the distribution of real wages in Western Europe. We thus depart from the standard methodology, which would involve designing a basket of consumption, calculating its cost and using it, along with nominal wages, to estimate welfare ratios over several centuries.[27]

We disagree with applying the customary methodology to early modern Spanish America for several reasons. First, the approach we adopt here does not need any assumptions as a starting point. In contrast, Allen et al. base their approach on two debatable premises: the uniformity of consumption patterns across most of the world, and within Spanish America.[28] That a certain similarity existed is probably true, but the differences were far from negligible and are overlooked when only a basic, standard basket is specified. The economic circumstances and cultural practices influencing consumer decisions

[27] Allen, Murphy and Schneider, 'The Colonial Origins of the Divergence'.
[28] *Ibid*.

were extremely diverse in Spanish America. In spite of some degree of market integration and cultural exchange within the region, differences in nutritional traditions and the availability of staple food between Mesoamerica (maize, squash and beans) and the Andes (potato, quinoa and charqui), or between the Southern Cone (wheat and beef) and the Caribbean (rice, beans and dried beef), were significant among commoners as well as elites. They were presumably larger than in other parts of the world that were more homogeneous in terms of geography and culture, like Europe and East Asia. For obvious geographical reasons, sizable differences within Spanish America are also apparent in terms of the need for protection against the weather (clothing, fuel and so on), not to mention those between parts of North America and many other areas in the remainder of the continent.

Second, the Columbian exchange could hardly have left Spanish America unaffected. The diffusion of the new species that expanded food supplies so dramatically was uneven across time and space. However, by the time of independence, the original pre-Columbian diets of the different territories had experienced more or less deep changes throughout the whole 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 examples of the joint effects of diffusion and commerce are cocoa and sugar – the two goods were complementary and widely consumed by all social classes in New Spain.[29] Consumption of 'low-price' cocoa by the 'poor' was made possible by imports from Guayaquil.[30] But this was not only in New Spain and cocoa-producing areas. Humboldt observed a 'great consumption of sugar in Spanish America, even among the least well-off'.[31] He also pointed out that in 'the Spanish colonies chocolate is considered not a luxury but a basic foodstuff'.[32] In addition, changes in relative prices, such as grain to meat or sugar to grain, produce different substitution effects in each country, which cannot be captured by using very long-term, fixed consumption baskets.[33] Thus, particularly in Spanish

[29] Margarita Menegus and Alejandro Tortolero, 'Introducción', in Menegus and Tortolero (eds.), *Agricultura mexicana: crecimiento e innovaciones* (Mexico City: Instituto Mora, 1999), pp. 7–32.

[30] Manuel Miño, 'El "cacao guayaquil" en Nueva España, siglo XVIII', *Mexican Studies/Estudios Mexicanos*, 25: 1 (2009), pp. 1–18.

[31] Humboldt, *Ensayo político*, p. 288, authors' translation.

[32] *Ibid*., p. 292.

[33] 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. For example, while corn and meat prices grew at roughly the same pace in Mexico City, in Bogotá increases in the price of meat clearly exceeded those of corn and potatoes (see http://gpih.ucdavis.edu/).

America, the very idea of an immutable consumption basket over three centuries seems inconsistent with a substantial body of evidence.[34]

Third, the approach chosen by Allen et al., and therefore by Arroyo et al., is very data-demanding. Since the available information on early modern Spanish American prices and wages is still clearly incomplete, different procedures for filling in a plethora of blanks (regressions, interpolations, averages, assumptions on the behaviour of markets for goods and their prices, and so on) have to be applied repeatedly. While nominal wages in pre-industrial 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 as well as long-term change. This contrast between wages and prices is evident in Spanish America.[35] Intervention to compensate for missing data might be acceptable within some limits in the case of wages, but not in that of prices.[36] Thus, we have decided to follow a version of the strategy initially defended by Allen himself when confronted with the poor quality of Asian data: 'In view of the weakness of the price data for other commodities, it might be better to relate wages to the basic cost of a calorie implied by bread and rice rather than to the broader cost of living.'[37]

Fourth, the 'universal' consumption basket estimated by Allen et al.[38] clearly contrasts with specific patterns of consumption found in Spanish America, for example in Arequipa (Peru), Buenos Aires and Santiago.[39]

[34] In Robert C. Allen, Jean P. Bassino, Debin Ma, Cristina Moll-Murata and Jan Luiten van Zanden, 'Wages, Prices, and Living Standards in China, 1738–1925, in Comparison with Europe, Japan, and India', *Economic History Review*, 64: S1 (2010), p. 17, Allen et al. recognise changes in the diet of Europeans when explaining the consumption basket used, describing it as 'late medieval in inspiration, in that it does not contain new commodities like sugar and potatoes introduced into Europe after the voyages of discovery'. In fact, they compute two different baskets for both China (Suzhou/Canton and Beijing) and Europe (northern Europe and Milan).

[35] In Bogotá and Potosí, wages seem not to have changed at all over the whole of the eighteenth century in nominal terms. In Mexico only minimal variation is perceptible. In terms of silver, the small decrease in nominal wages observed in the very long 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: see www.iisg.nl/hpw/data.php#europe.

[36] 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, their coefficients of inter-annual variation being 51.3 and 18.6 per cent, respectively, between 1700 and 1810: calculated using data from www.iisg.nl/hpw/data.php#europe.

[37] Allen, 'Real Wages in Europe and Asia', p. 122.

[38] Allen, Murphy and Schneider, 'The Colonial Origins of the Divergence'.

[39] See, respectively, Kendall W. Brown, 'Price Movements in Eighteenth-Century Peru: Arequipa', in Johnson and Tandeter (eds.), *Essays on the Price History*, pp. 173–200; Johnson, 'The Price History of Buenos Aires'; and Jorge Larraín, 'Productos y precios: el caso chileno

Differences between the simple (four items) and 'quasi-vegetarian' food component of the former and the diversity and relative sophistication of the latter are significant.[40] Arroyo et al. propose a more accurate approach, since they distinguish between 'meat eaters' (Argentina and Chile) and 'others' (Bolivia, Colombia, Mexico and Peru). The consumption basket of the 'others' is assumed to include much more meat than in Europe (35 kilos per capita versus 5 kilos). Nevertheless, all indications, at least for New Spain and Colombia, suggest that meat consumption might be even higher.[41] As for alcohol, habits in some American territories do not fit with the claim by Allen et al. that it was 'seldom enjoyed'.[42] Thus an excessively simple, 'sober' basket, consisting of maize, beans/peas, meat and butter, fails to capture an important aspect of the complex reality of food consumption in Bourbon Spanish America.[43]

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en los siglos XVII y XVIII', in Lyman L. Johnson and Enrique Tandeter (eds.), *Economías coloniales: precios y salarios en América Latina, siglo XVII* (Mexico City: Fondo de Cultura Económica, 1992), pp. 119–52.

[40] Brown, 'Price Movements', 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 mestizo families. In Buenos Aires, meat, fish (fresh and dried) and *yerba mate* were important parts of the commoners' diet: see Johnson, 'The Price History of Buenos Aires'. The structure of expenditure in Santiago was also rather diverse, since fat, sugar, animal proteins (dried beef, mutton, fresh and dried fish and seafood), fruits and vegetables (potatoes) are included along with wheat and flour. Moreover the share of non-vegetarian items, excluding animal fat, was 27.1 per cent in 1754–8: see Larraín, 'Productos y precios', p. 122.

[41] For the sake of academic rigour, contrary to what Arroyo et al. claim, the idea of Mexico City having surprisingly low meat prices does not belong to Dobado-González and García-Montero (inappropriately quoted as 'Gonzalez', incidentally, in 'Between Conquest and Independence', p. 29 n. 49). In fact, this interesting contribution should be attributed to Enriqueta Quiroz, *Entre el lujo y la subsistencia: mercado, abastecimiento y precios de la carne en la ciudad de México, 1750–1812* (Mexico City: El Colegio de México, 2005).

[42] Allen et al., 'Wages, Prices, and Living Standards in China', p. 7. Alcohol, essentially wine, amounted to 7 per cent of expenditure in mid-eighteenth-century Santiago: see Larraín, 'Productos y precios', p. 122. In Buenos Aires, wine and *eau de vie* were increasingly consumed in the late Bourbon period: see Johnson, 'The Price History of Buenos Aires', p. 166. Humboldt (*Ensayo político*, p. 133) mentions the 'enormous quantity' of pulque consumed by Mexican inhabitants of varied ethnic origin when compared with total alcoholic beverages sold in Paris: 'Indians, mestizos, mulatos and even most of the creole whites'. On the importance of pulque in Mexico City, see Miguel Ángel Vásquez, 'Las pulquerías en la vida diaria de los habitantes de la Ciudad de México', in Pilar Gonzalbo (ed.), *Historia de la vida cotidiana en México,* vol. 3: *El siglo XVIII: entre tradición y cambio* (Mexico City: El Colegio de México and Fondo de Cultura Económica, 2005), pp. 71–95. Chicha was no less popular among the Andean population.

[43] Allen, Murphy and Schneider, 'The Colonial Origins of the Divergence', p. 43; and Arroyo Abad, Davies and van Zanden, 'Between Conquest and Independence', p. 45.

Fifth, the methodological choice made by Allen et al. and Arroyo et al. is based on some arguable assumptions, especially during a period lasting three centuries, regarding the size of the average family (fixed without further elaboration at four members of unknown ages) and the number of working days a year (arbitrarily taken to be 250). In fact, 'average' family size changed in response to economic conditions and evolved over the family's life cycle. Ethnicity also influenced family size. Moreover, it was not uncommon for women and children to contribute to family subsistence, but this was not evenly distributed over time or across space. The construction of an international estimate for the number of working days a year does not properly fit with the variety of labour practices existing in different economic sectors (urban, rural and mining) and the likely changes over the long term. Moreover, the increasing substitution of free for coerced labour probably influenced the number of days worked per year in Spanish America.

For these reasons, our estimate of real wages yields straightforward, intuitive results which, as will be seen, turn out to offer a less pessimistic view of living standards in Bourbon America than that of Allen et al. but are consistent with that of Arroyo, when reinforced by evidence on biological welfare. Nonetheless, in this paper, as in our earlier work, one may observe important regional differences. Arroyo et al. also found such variations.

One more methodological observation is worth considering. The wage levels reported in some sources might well not be those effectively paid to workers. This is particularly true if wage rates are taken from administrative sources in regulated labour markets or from very general references. Thus, in eighteenth-century Potosí, both *mingas* (free workers) and mitayos (coerced workers, albeit wage earners) effectively increased their earnings by working longer hours than those established by custom for the former and by law for the latter.[44] At the same time, the inhabitants of Potosí, including the mitayos and their families, had free access to the mines during the weekends to extract and process minerals. This practice was known as *kajcheo* and might have contributed substantially to raising the incomes of an indeterminate, albeit not unimportant, sector of Potosí's permanent and temporary population.[45] On the other hand, mitayos might be helped by their families' unpaid work when they were assigned excessive labour obligations.[46] In New Spain the *partido*, a variable share of the minerals extracted by some miners during the working day, was an integral and significant component, though not one registered in the available sources, of their earnings.[47] Moreover, the

[44] Tandeter, *Coacción y mercado.*

[45] Silver obtained by this segment of the population (*kajchas*) was far from insignificant: more than one-third of total legally registered production (*ibid*., p. 124).

[46] *Ibid.*

[47] Brading, *Mineros y comerciantes*; Ladd, *Génesis y desarrollo de una huelga.*

importance of partidos was such that miners 'in many regions were practically partners of their patrons'.[48] The attempts to reduce or eliminate partidos were a constant source of labour conflicts in New Spain's mining centres.[49]

As for economic sectors other than mining, cash payments to important segments of the wage labour force (rural and urban labourers) were frequently supplemented with other payments in kind of indeterminate and variable magnitude.[50] Thus, when working with the nominal daily wages in Bourbon America that may be found in many primary and secondary sources, or monthly and yearly incomes for that matter, it is necessary to ascertain whether they were complemented with payments in kind, or access to land for cultivation or stock-raising, or the opportunity to extract minerals. If not, the nominal wage recorded would be closer to a minimum than a maximum.

Wages in the Early Nineteenth Century

Table 1 shows daily monetary wages, the average of the available data for the 1800s, in terms of grams of silver for a sample of cases across the world, excluding Africa. Where possible, real wages, estimated as their purchasing power in terms of kilos of grain, meat and sugar for the same years, are also depicted.

Monetary wages

As expected, and confirming a fact well known since at least the times of Adam Smith, silver wages were substantially higher in the United States and England than in other parts of the world, and much lower in Asia than elsewhere. Less expected was perhaps to find Spanish American wages at medium to high levels. In contrast to many views of mining in the post-Columbian period, unskilled miners were well paid by international standards, even in the case of mitayos (Potosí (1, 5) in Table 1). The wages of rural and urban labourers in Spanish America surpassed those in southern, central and eastern Europe and Asia, with the exception of certain Spanish provinces.

[48] Brading, *Mineros y comerciantes*, p. 201, author's translation.
[49] Ladd, *Génesis y desarrollo de una huelga*; Keen and Haynes, *A History of Latin America*.
[50] 'There might be good economic reasons for the generalization of payments in kind frequently observed in underdeveloped – colonial or not – economies. In-kind wages can be more effective for increasing the supply of labour than wages in cash when food-security considerations are important for workers, such as in cases of poverty or thin food markets: see Takashi Kurosaki, 'Wages in Kind and Economic Development: Historical and Contemporary Evidence from Asia', PRIMCED Project, Discussion Paper Series no. 11, Hitotsubashi University, March 2011.

Table 1. *Nominal and Real Wages by the 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	*Bogotá (1)*	*12.3*	Vermont (2)	6.9	Massachusetts (2)	2.6
Potosí (4)	*18.2*	*Potosí (4)*	*9.9*	*Guadalajara (1)*	*5.7*	*Mexico City (1)*	*2.3*
Maryland (2)	17.4	*Guadalajara (1)*	*9.5*	*Mexico City (1)*	*5.6*	*Bogotá (1)*	*2.0*
London (1)	17.2	Leipzig (1)	8.7	West Virginia (3)	5.6	*New Spain, Highlands (2)*	*1.5*
Vermont (2)	14.1	*Guadalajara (2)*	*7.6*	Maryland (2)	5.4	London	1.4
West Virginia (3)	13.8	Southern England (1)	7.5	Massachusetts (1)	4.6	Vermont (2)	1.3
Potosí (1, 4)	*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	*Potosí (4)*	*1.0*
Buenos Aires (1)	*10.9*	*Mexico City (1)*	*6.7*	*New Spain, Highlands (2)*	*4.1*	Southern England (1)	1.0
Guanajuato (4)	*10.6*	*Potosí (1, 5)*	*6.6*	*Potosí (4)*	*4.1*	Barcelona (1)	0.9
Chile (4)	*9.6*	Antwerp (1)	5.9	*Bogotá (1)*	*3.2*	Southern England (2)	0.7
Amsterdam (1)	9.2	Palencia (1)	5.8	Amsterdam (1)	2.8	*Potosí (1, 4)*	*0.7*
Barcelona (1)	9.1	*San Luis Potosí (1)*	*5.7*	*Potosí (1, 4)*	*2.7*	*Santiago de Chile (1)*	*0.6*
Mexico City (1)	*9.1*	*New Spain, Highlands (2)*	*5.6*	London (1)	2.1	Antwerp (1)	0.5
Southern England (2)	8.6	Southern England (3)	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, Lowlands (2)	*7.1*	Gdansk (1)	3.6	Southern England (1)	1.5	Amsterdam (1)	0.4
Antwerp (1)	6.9	Calcutta (3)	3.1	Beijing (1)	1.3		

Palencia (1)	6.7	*Buenos Aires (1)*	*3.0*	Almadén (1)	1.1
San Luis Potosí (3)	*6.3*	Almadén (1)	2.6	Southern England (2)	1.0
Guadalajara (2)	*6.1*	Porto (1)	2.2	Vienna (1)	1.0
Bogotá (1)	*6.1*	Vienna (1)	2.1	Milan (1)	0.7
Santiago de Chile (1)	*6.1*	Milan (1)	1.8		
New Spain, Highlands (2)	*6.0*	Kyoto (1)	1.6		
Istanbul (1)	5.3	Beijing (1)	1.6		
Porto (1)	5.1	Pune (3)	1.1		
Gdansk (1)	4.8				
Almadén (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				

Note: locations in Latin America in italics.
Legend: (1) urban; (2) rural; (3) unspecified; (4) qualified miner; (5) unqualified miner, mitayo.

Grain wages

One might expect silver wages in Spanish America to be at medium to high levels from an international perspective, given that it was a silver-producing region. Nonetheless, their purchasing power in terms of grain compares even more favourably with cases elsewhere in the world. In fact, in relative terms, 'grain wages' are higher than silver wages (see Table 1). This improvement in relative positions does not seem to be caused by any selection bias (although the samples do not match each other exactly because of data availability problems), since it is true for most Spanish American territories (New Spain, New Granada and Upper Peru).[51] Buenos Aires should be considered an exception due to particular temporary circumstances.[52] Our findings suggest, at least as far as the main component of the pre-industrial diet is concerned, that prices in Spanish America by the early nineteenth century (Potosí excepted, in part because of high transport costs) were not generally higher than in other parts of the world, in spite of the region's abundant silver production.

Had the silver wages in some European countries been deflated by prices of rye, a rather inferior cereal, instead of wheat, the picture emerging from Table 1 would be slightly, but not significantly, different, since rye was usually about one-third cheaper than wheat. In any event, it seems clear that Spanish American silver wages provided a comparatively decent standard of living in terms of calories. Even in the worst, exceptional case of Buenos Aires, they permitted the wage earner to acquire at least 3 kilos of wheat (some 10,000 calories) a day (see Table 1). Thus, while our findings do not support revisionist statements about Eastern living standards, they suggest that pre-independence Spanish America was closer to the most developed Western countries than to other parts of the world, in spite of the significant differences that existed between those territories at the top (Bogotá) and, with the exception of Buenos Aires, those at the bottom of the distribution (San Luís Potosí and the highlands of New Spain).

We do not regard the claim that 'the gap between the "silver wage" and the "grain wage" can hence be used as an indicator of the level of development' as a statement that can be confirmed.[53] This is probably due to the inclusion of the Americas, where silver and grain wages both tend to be relatively high

[51] It is probable that Chilean grain wages were also high in comparative terms, as this captaincy-general was a net exporter of wheat. Moreover, flour prices in grams of silver were lower in Santiago than in Pennsylvania between 1720 and 1805: see http://gpih.ucdavis.edu/Datafilelist.htm.

[52] A period of abnormally high wheat prices commenced in 1803 as a result of intense drought and political and military turmoil: Johnson, 'The Price History of Buenos Aires', p. 182. The average price of wheat in 1803–6 was triple that of 1791–1802 (*ibid*., pp. 170–1).

[53] Broadberry and Gupta, 'The Early Modern Great Divergence', p. 3.

in the sample. On the contrary, we find a positive correlation between silver wages and grain wages within our worldwide sample. This correlation increases when only the American sub-sample is considered.

Meat wages

This analysis should also take into account the possible objection that grain wages may not provide sufficient evidence regarding living standards and physical welfare. We therefore estimate the purchasing power of wages in terms of meat, a superior good and a rich source of animal proteins, which was scarcely present in the pre-industrial diet of most of the world's population.

As Table 1 shows, meat wages in Spanish America, especially in Argentina, were high to very high, comparable to those in North America and clearly ahead of Europe, let alone, presumably, Asia. Even in the worst of cases, that of the Potosí mitayos, who were clearly worse off in this respect than other Spanish Americans, the meat wage compares favourably with that of most Europeans. The main explanation behind this somewhat surprising finding is that meat was relatively inexpensive in many parts of Spanish America.[54] Only in Potosí are prices above the sample average.

Thus, in contrast to the general pre-industrial picture (North America excepted), meat could form an important part of the diet of commoners in Spanish America. This was well known for Argentina, and would hold true even if our source might underestimate the price of meat in early nineteenth-century Buenos Aires. More surprising is the high level of meat consumption that Quiroz found in Mexico City: an estimated 142 kilos per capita in 1767, including beef, pork and poultry, though not animal proteins that were obtained through hunting and fishing.[55] This is quite a lot by any standard of that era![56] While the pre-Columbian population had limited and uneven access to animal proteins, the new economic system that followed the conquest made meat consumption much easier and more widespread, at least in towns, by combining the adoption of previously non-existent species (cattle, sheep,

[54] 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 markets in New Spain than in London and southern England, while in Massachusetts it was more than twice as expensive as in Bogotá.

[55] Quiroz, 'Entre el lujo y la subsistencia', p. 43.

[56] Annual per capita consumption of fresh red meat by New Yorkers grew from 132.3 pounds (about 60 kilos) in 1790 to 166.5 pounds (just over 75 kilos) between 1795 and 1816: Gergely Baics, 'Appetite for Beef: How Much Meat Did Early New Yorkers Consume?', Working Paper MWP 2010/15, European University Institute (2010), p. 7. Meat consumption in the Thirteen Colonies was slightly higher than in republican New York: *ibid*., p. 9.

goats and pigs) with the regulation and support of the market for meat. Meat became a popular product consumed on a regular basis even by the indigenous population.[57] Even if the contribution that poultry made to the total consumption of meat in Mexico City (almost 20 per cent) is subtracted, New York still lags far behind. This comparison highlights the impressive consumption of meat by inhabitants of Mexico City, almost twice as much as North Americans, not to mention Europeans, and is consistent with the picture shown in Figure 1. However, meat consumption might have decreased by the late eighteenth century. Humboldt estimated total meat consumption at 189 pounds (85 kilos) per capita in 1791 – a substantial fall indeed, but still far higher than the norm in Europe and other parts of the world.[58] And it was not only Mexico City's inhabitants and urban and rural labourers in New Spain in the early nineteenth century who could consume meat on this scale. In the 1760s miners at Real del Monte were able to buy relatively large amounts of meat with just a part of their daily silver wage.[59] Moreover, the case of New Spain seems not to be the exception but rather the rule within Spanish America, as the meat wages in Table 1 clearly show. In the case of Chile, Quiroz shows comparatively meat-intensive consumption patterns in Santiago.[60]

Thus, a certain similarity across the Americas in terms of meat consumption emerges from Table 1. This is probably due to a basic likeness in factor endowments there – abundant land and scarce labour – which contrasts markedly with those of most of Europe and Asia. It reflects an important advantage in living conditions, such as the possibility of consuming animal proteins. Relatively high meat wages suggest that, as opposed to Europe and, *a fortiori*, Asia, access to this superior good was not such a clear indication of status in some parts of Spanish America. Long after meat became more and more scarce in common people's diet in most parts of the world, the United States being an exception, many Spanish American labourers could still consume it in significant quantities.[61]

[57] Quiroz, 'Entre el lujo y la subsistencia', p. 65.

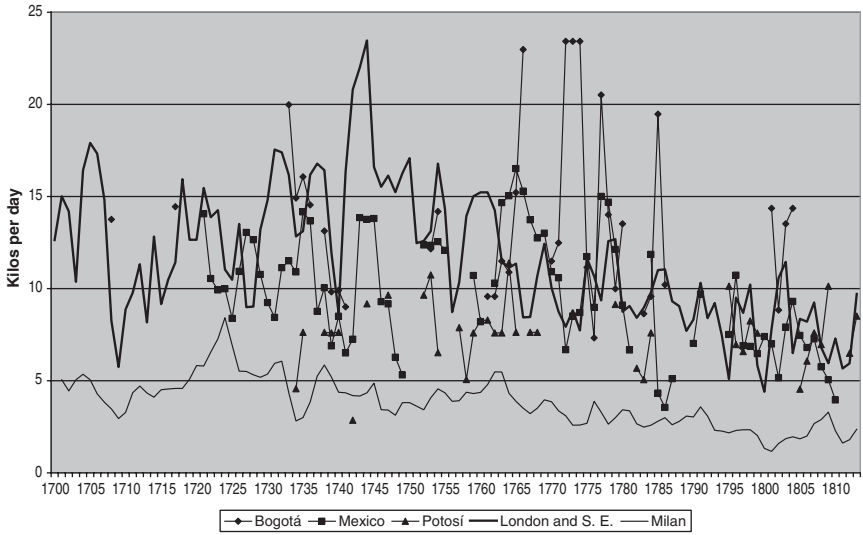
[58] *Ibid*., p. 44. The representative basket of an average urban consumer in the Ottoman Empire includes 51.2 kilos of mutton per year: Süleyman Özmucur and Şevket Pamuk, 'Real Wages and the Standards of Living in the Ottoman Empire, 1469–1914', *Journal of Economic History*, 62: 2 (2002), p. 298. In their attempt to capture 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, Murphy and Schneider, 'The Colonial Origins of the Divergence'.

[59] Ladd, *Génesis y desarrollo de una huelga*, p. 34.

[60] Quiroz, 'Salarios y condiciones de vida'.

[61] On Europe, see Massimo Livi Bacci, *The Population of Europe* (Oxford: Blackwell, 2000), p. 49.

Figure 1. *Grain Wages in London and Southern England, Milan, Bogotá, Mexico City and Potosí, 1700–1813*



Sugar wages

In terms of wages measured by the price of sugar – a proxy for those luxury goods resulting from the Columbian exchange and a rich source of calories as well – conditions in Spanish America were similar, or in some cases better, than in more developed parts of the world (see Table 1).[62] If, as asserted by Jonathan Hersh and Hans Voth, European living standards improved through gains from new goods like sugar, chocolate and tobacco, Spanish American labourers seem to have significantly – and probably earlier, albeit unevenly – benefited from this outcome.[63] An increase in economic welfare resulted from relatively low prices for sugar, again with the exception of Potosí.

[62] While the share of 'sugar and sweets' in the structure of expenditure estimated by Larraín ('Productos y precios') for Santiago in 1754–8 is 6.5 per cent, neither Özmucur and Pamuk ('Real Wages and the Standards of Living') nor Allen et al. ('Wages, Prices, and Living Standards in China') include it in their representative baskets for the Ottoman Empire and China, Europe, Japan and India respectively. Sugar is also part of the basket specified for Arequipa's mestizo families by Brown ('Price Movements'). Go and Lindert consider sugar in their comparison of real wages between nineteenth-century Massachusetts and West Virginia and eighteenth- and nineteenth-century Massachusetts and England, available at http://gpih.ucdavis.edu/Datafilelist.htm#NorthAmerica.

[63] Jonathan Hersh and Hans J. Voth, 'Sweet Diversity: Colonial Goods and the Rise of European Living Standards after 1492', Discussion Paper no. DP7386, Centre for Economic Policy Research, 2009.

https://doi.org/10.1017/S0022216X14000054 Published online by Cambridge University Press

Summarising, therefore, the empirical evidence does not seem to support the conclusion, in terms of international comparisons, that Spanish American urban and rural labourers and unskilled miners suffered from low real wages in the early nineteenth century, despite significant inter-territorial differences. Rather, the contrary turns out to be true, especially in terms of luxury or quasi-luxury goods such as sugar and meat.

Real Wages over the Bourbon Period

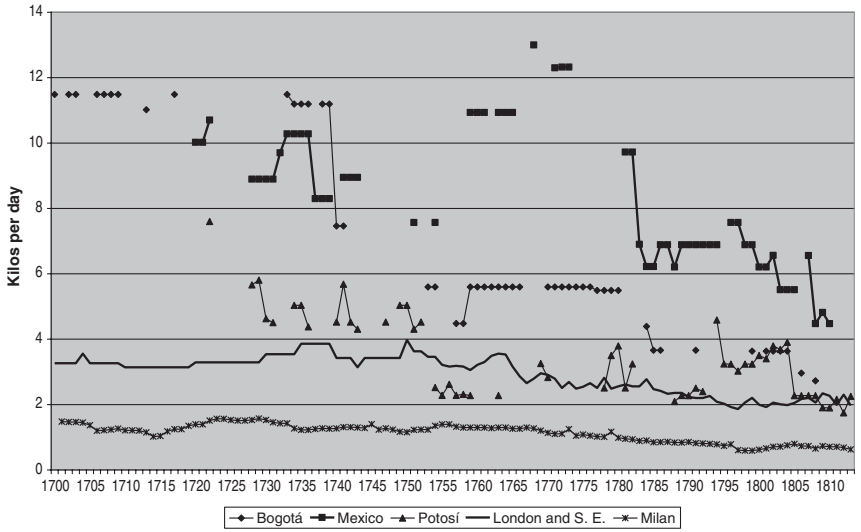
This section provides a comparison of real wages for unskilled workers in Spanish America (Bogotá, Mexico City and Potosí) and Europe (London and southern England, and Milan) over the Bourbon period.[64] Thus, we first check for the robustness of our estimates when the time span is significantly expanded, and, second, 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, which suggests that grain wages were significantly lower in Milan than in the other cases, and also followed a downward trend after the 1760s.[65] As anticipated, grain wages were much higher in London and southern England, but they shared a similar falling trend that started even earlier. This trend was also experienced in Bogotá and Mexico City, but not in Potosí, where they remained basically constant. From the 1760s onwards, grain wages in Bogotá were frequently far above those in London and southern England. This was not the case in Mexico City during the first half of the eighteenth century. Afterwards, the Mexican and the English series shared a downward trend and their levels converged. Thus, grain wages in Bourbon Spanish America were generally at similar levels to, and occasionally higher than, those in the richest

[64] According to Allen ('The Great Divergence'), London and southern England and Milan may, respectively, represent the top and bottom of the range of real wages and living standards within European countries of intermediate to high level of economic development during the eighteenth and early nineteenth centuries. The three Spanish American cities were different in relevant respects (size, location, political and economic functions). Mexico City was the largest in the Americas until the nineteenth century and the capital of the principal Spanish viceroyalty. Bogotá had a much smaller population (roughly one-tenth of Mexico City) and a relatively simple economic life. Potosí, an important Andean mining centre, is generally assumed to be the epitome of the Spanish colonial exploitation in America.

[65] With respect to Mexico, since nominal wages of building labourers remained practically constant throughout the eighteenth and early nineteenth centuries, missing observations in those years for which data on corn and meat prices are available have been replaced by the value of the previous year. Thus we assume that nominal wages after 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).

Figure 2. *Meat Wages in London and Southern England, Milan, Bogotá, Mexico City and Potosí, 1700–1813*



European country and, with the exception of Potosí, registered a comparable falling trend during the final decades before independence.

Figure 2 shows meat wages between 1700 and 1810. 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 City and Bogotá. In all cases, during the second half of the eighteenth and the early nineteenth centuries in Spanish America, meat wages decreased sooner (Bogotá and Potosí) or later (Mexico City). This fall also took place in Europe. On the other hand, at the end of this period the meat wages of Mexicans remained above those of people in London and southern England, while in the three Spanish American cities they were still much higher than in Milan.

Summarising, 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 centuries, Potosí 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 United States like Massachusetts, but not Maryland.[66]

[66] See Go and Lindert, http://gpih.ucdavis.edu/Datafilelist.htm#NorthAmerica; and Donald R. Adams, 'Prices and Wages in Maryland, 1750–1850', *Journal of Economic History*, 46: 3 (1986), pp. 625–45.

https://doi.org/10.1017/S0022216X14000054 Published online by Cambridge University Press

No inconsistencies seem to arise between the synchronic and diachronic exercises performed in this section. They coincide in suggesting that there seems to be room for some optimism regarding the real wages of Spanish American labourers during the Bourbon period, and that the 'Great Divergence' in Spanish American real wages, as opposed to what happened in the East, is rather a nineteenth-century phenomenon.[67]

Heights

This section presents evidence on heights, again adopting an international comparative perspective. Our hand-collected data for northern and south-eastern areas of New Spain and the Captaincy-General of Venezuela (Maracaibo, hereinafter Venezuela), come from archival sources: *filiaciones* and militia muster rolls.[68] In the face of increasing military threats during the second half of the eighteenth century, militias were created as auxiliary forces of the regular army. They were composed of adult males living in a certain city or region, selected on a random basis.[69] Excluded from conscription were those suffering from serious physical handicaps, public servants, European traders, some highly skilled individuals, and slaves. Militias comprised all ethnic groups but Indians. The minimum height requirement remained unchanged at 5 feet.[70] Thus, we have been able to build a database consisting initially of almost 6,000 observations. After the necessary adjustments to take account of age and truncation, this has been reduced to 2,564. It may still be considered a fairly representative sample of generations born between 1730 and 1780 in those territories.

[67] Broadberry and Gupta, 'The Early Modern Great Divergence', and Allen et al., 'Wages, Prices, and Living Standards in China'.

[68] Filiaciones are individual identification documents that include personal and other information (service term, payments, unit, place of recruiting and active service seen). Most of our data for northern New Spain come from this source. Muster rolls, a list reporting heights and, occasionally, other personal and professional information for every militiaman are the source of data for south-eastern New Spain and Venezuela.

[69] We know that all filiaciones belong to people born in Spanish America because that information is included in the source. As for muster rolls, in some cases (the Milicia de Blancos de Maracaibo and the Batallón de Infantería de Castilla de Yucatán) the source also shows a final summary with the origin of all individuals listed. It can be seen that nearly 100 per cent were born in the place to which the militia belonged. According to María del Carmen Gómez Pérez, *El sistema defensivo americano, siglo XVIII* (Madrid: Fundación MAPFRE América, 1992), p. 61, more than 90 per cent of militiamen were Spanish Americans rather than Spaniards.

[70] The metric system was based on the Paris foot or *pied du roi*: 1 foot = 32.5 cm, 1 inch = 2.71 cm. See Antonio D. Cámara Hueso, 'Fuentes antropométricas en España: problemas metodológicos para los siglos XVIII y XIX', *Historia Agraria*, 38: 1 (2006), pp. 105–18; and Amílcar Challú, 'Agricultural Crisis and Biological Well-Being in Mexico, 1730–1835', *Historia Agraria*, 47: 1 (2009), p. 24.

By the mid-eighteenth century, men in northern New Spain appear within the medium range of the international sample for the eighteenth century. They were taller than in some European countries, as well as Asia. Our finding of relatively high heights for them contrasts with the poor health index, the two lowest in a sample of 65 archaeological sites across the Americas over the last seven millennia, that Steckel et al. estimated for pre-Spanish indigenous populations of New Mexico.[71] *Blancos* (whites) from Venezuela were even rather tall by Western standards of the period. According to Challú's estimates, central Mexico would lie within the mid-low range of countries shown in Table 2, at a similar level to Spain.[72] Blancos from south-eastern New Spain were clearly short, albeit taller than Indonesian slaves born between the 1770s and 1790s (157.4 cm) and Japanese of the Edo-Tokugawa Era (159.2 or 157.2 cm, depending on the calculation formula).[73] However, the heights found in south-eastern New Spain may also be found in less developed European countries and regions at some point during the eighteenth and nineteenth centuries (for example, Russia or Limousin and Orléans in France).[74] Moreover, it is doubtful that the sample of blancos is genetically comparable to that of northern and central New Spain. We suspect

[71] Richard H. Steckel and Jerome C. Rose, 'A Health Index from Skeletal Remains', in Steckel and Rose (eds.), *The Backbone of History: Health and Nutrition in the Western Hemisphere* (Cambridge: Cambridge University Press, 2002), pp. 61–93.

[72] Challú, 'Agricultural Crisis' and 'The Great Decline'.

[73] See Joerg Baten, Mojgan Stejl and Pierre van der Eng, 'Long-Term Economic Growth and the Standard of Living in Indonesia', Working Paper in Economics and Econometrics no. 514, Australian National University (February 2010); Carles Boix and Frances M. Rosenbluth, 'Bones of Contention: The Political Economy of Height Inequality', paper presented at the annual meeting of the American Political Science Association, 2004, available at www.princeton.edu/~cboix/bones.pdf.

[74] For Limousin, Orléans, Austria-Hungary, Italy, Portugal, Russia and Spain, see Laurent Heyberger, *La révolution des corps: décroissance et croissance structurale des habitants des villes et des campagnes en France, 1780–1940* (Strasbourg: Presses Universitaires de Strasbourg, 2005); Hermann Schubert and Daniel Koch, 'Anthropometric History of the French Revolution in the Province of Orleans', *Economics and Human Biology*, 9: 3 (2011), pp. 277–83; John Komlos, *Nutrition and Economic Development in the Eighteenth-Century Habsburg Monarchy: An Anthropometric History* (Princeton, NJ: Princeton University Press, 1989); Brian A'Hearn, Franco Peracchi and Giovanni Vecchi, 'Height and the Normal Distribution: Evidence from Italian Military Data', *Demography*, 46: 1 (2009), pp. 1–25; Marco Breschi and Lucia Pozzi (eds.), *Salute, malattia e sopravvivenza in Italia fra '800 e '900* (Udine: Forum, 2007); Joerg Baten, Jaime Reis and Ivonne Stolz, 'The Biological Standard of Living in Portugal, 1720–1980: When and Why Did the Portuguese Become the Shortest in Europe?', paper presented at XVth World Economic History Congress, Utrecht, 2009; Boris Mironov, 'The Burden of Grandeur: Physical and Economic Well-Being of the Russian Population in the Eighteenth Century', in Robert C. Allen, Tommy Bengtsson and Martin Dribe (eds.), *Living Standards in the Past: New Perspectives on Well-Being in Asia and Europe* (Oxford: Oxford University Press, 2005), pp. 255–77; Héctor García-Montero, 'El nivel de vida biológico de los españoles a finales del Antiguo Régimen', paper presented at II Encuentro Anual de la Asociacón Española de Historia Económica, Madrid, 2010.

Table 2. *Average Height of Adult Males in Selected Countries and Regions (Cohorts Born from the 1730s to the 1840s)*

	1730s	1740s	1750s	1760s	1770s	1800s	1830s	1840s
Argentina (1780s–1800s)					*168.0*		*171.0*	*169.5*
Central Mexico (Challú)		*165.2*	*163.7*	*164.5*	*163.2*	*162.0*	*160.4*	
Maracaibo blancos	*169.0*	*169.0*	*167.5*	*168.0*				
Maracaibo pardos	*162.7*	*164.7*	*166.0*	*166.5*				
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		164.0	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 (Cinnirella)		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
England (Komlos and Küchenhoff)		172.5	172.0	171.0	168.5	164.0	163.5	160.5
United States	172.1	172.1	172.2	172.5	172.8	172.9	173.5	172.2

Note: locations in Latin America in italics.

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, might affect the comparison.[75] Mayans of ninth-century Copán also exhibit one of the lowest health index values in the American sample analysed by Steckel et al.[76] In contrast to men in

[75] Luis Ríos, 'Guatemala: una revisión de las fuentes antropométricas disponibles', *Historia Agraria*, 47 (2009), pp. 227–30, 233–4. Some factors point to a possible downward bias in our estimation of height for south-eastern New Spain. Militiaman height is closer to the European standards in the only case in which the 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). Moreover, officers' height was never recorded, and this is largely true also for sub-officers. Additionally, most skilled workers were excluded from conscription. The modal value of the height distribution, if 'heaping' is omitted, is roughly 61 French inches (approximately 165 cm). Thus, our estimate might rather be considered the lower bound of heights in south-eastern New Spain. Some of these remarks also apply for the remainder of the New Spain samples.

[76] Steckel, 'A Health Index from Skeletal Remains'.

south-eastern New Spain, Argentines born in the final two decades of the eighteenth century turn out to be among the tallest populations in the world at approximately 168 cm, after conversion to a system based on the Paris foot.[77] This finding is consistent with estimates by Salvatore, Baten et al. and Baten for the 1820s onwards (see Table 2).[78] By 1810, Peruvians were not that tall, but nor were they shorter than some Europeans.[79]

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 regions in pre-twentieth-century Europe either (see note 76). A racial gap certainly existed in Bourbon Spanish America, as shown by the difference in height between blancos and pardos, but it evolved in a particular way during the central decades of the century, falling in Venezuela and narrowing until it practically disappeared in south-eastern New Spain. In any case, this racial gap is substantially smaller than the gap found in England by John Komlos between the two extreme poles of the social spectrum, similar to that observed between slaves and free whites in the United States but higher than in nineteenth-century Brazil and Peru.[80]

Confirming findings in health over the past seven millennia by Steckel et al., a relatively high variance in height is found across Spanish American territories.[81] This probably reflects substantial differences in income and productivity between territories, similar to those shown in all available

[77] Salvatore and Baten, 'A Most Difficult Case of Estimation'; Salvatore, 'Heights and Welfare'; Joerg Baten and Scott Carson, 'Latin American Anthropometrics, Past and Present: An Overview', *Economics and Human Biology*, 8: 2 (2010), p. 142 n. 1.

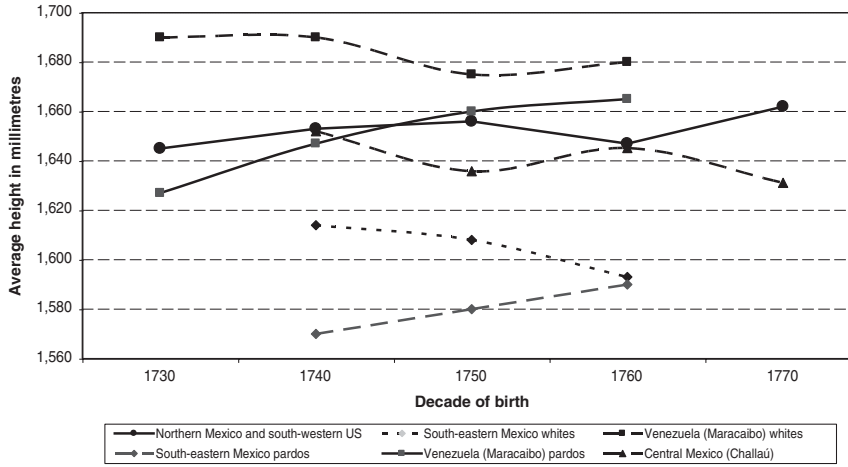
[78] See Ricardo D. Salvatore, 'Heights, Nutrition and Well-Being in Argentina, ca. 1850–1950: Preliminary Results', *Revista de Historia Económica/Journal of Iberian and Latin American Economic History*, 25: 1 (2007), pp. 53–86; Joerg Baten, Ines Pelger and Linda Twrdek, 'The Anthropometric History of Argentina, Brazil and Peru during the 19th and Early 20th Century', *Economics and Human Biology*, 7: 3 (2009), pp. 319–33; Baten, 'Argentina's Early Anthropometric History, 1820–1860s'.

[79] Baten, Pelger and Twrdek, 'The Anthropometric History'; Linda Twrdek and Kerstin Manzel, 'The Seed of Abundance and Misery: Peruvian Living Standards from the Early Republican Period to the End of the Guano Era', *Economics and Human Biology*, 8: 2 (2008), pp. 145–52.

[80] On England, see John Komlos, 'On English Pygmies and Giants: The Physical Stature of English Youth in the Late 18th and Early 19th Centuries', *Research in Economic History*, 25 (2007), pp. 149–68. On the United States, see Robert Margo and Richard H. Steckel, 'Heights of Native-Born Whites during the Antebellum Period', *Journal of Economic History*, 43: 1 (1983), pp. 167–74; and Richard H. Steckel, 'A Peculiar Population: The Nutrition, Health, and Mortality of American Slaves from Childhood to Maturity', *Journal of Economic History*, 46: 3 (1986), pp. 721–41. On Brazil and Peru, see Baten, Pelger and Twrdek, 'The Anthropometric History'; and Twrdek and Manzel, 'The Seed of Abundance and Misery'.

[81] Steckel and Rose (eds.), *The Backbone of History*.

Figure 3. *Average Height of Adult Males in Northern and South-Eastern New Spain and Maracaibo, 1730s–1770s*



estimates for the early nineteenth century.[82] Within New Spain a north–south gradient may be observed, with Challú's estimates for central New Spain lying between ours for the northern and south-eastern regions of the viceroyalty.[83]

It is difficult to observe a clear trend in our data. However, they do not suggest any 'Great Decline' in heights starting before the mid-eighteenth century, as concluded by Challú for central New Spain.[84]

We accept that, in parallel with similar trends observed in most European countries by Komlos and Baten, and Komlos and Küchenhoff, some decline in heights might have taken place in late eighteenth- and early nineteenth-century New Spain.[85] A certain fall in physical statures at the end of the eighteenth century is consistent with the fall in real wages observable in Figures 1 and 2. Nonetheless, as Challú claims, the 'declining trend over the

[82] Angus Maddison, *The World Economy: A Millennial Perspective* (Paris: OECD, 2001); Coatsworth, 'Inequality, Institutions and Economic Growth'; Prados de la Escosura, 'Lost Decades?'.

[83] Results obtained by Grajales-Porras and López-Alonso for two villages of the intendancy of Puebla fit well within this picture: see Grajales-Porras and López-Alonso, 'Physical Stature of Men', p. 269.

[84] Challú, 'Agricultural Crisis' and 'The Great Decline'.

[85] John Komlos and Joerg Baten, 'Looking Backward and Looking Forward: Anthropometric Research and the Development of Social Science History', *Social Science History*, 28: 2 (2004), pp. 191–210; John Komlos and Helmut Küchenhoff, 'The Diminution of the Physical Stature of the English Male Population in the Eighteenth Century', *Cliometrica*, 6: 1 (2012), pp. 45–62.

second half of the eighteenth century was nothing exceptional in international perspective'.[86] Moreover, if we fully accept the decline estimated by this author (approximately 2.5 cm between the 1740s and the 1790s), it turns out to be not that 'great' since, according to Komlos and Küchenoff, the fall in heights of adult men between the eighteenth-century peak and trough was similar or higher in most European countries (ranging from 0.4 cm per decade in Saxony to 1.8 in Bavaria).[87]

Our findings for New Spain may be placed in a pluri-secular perspective in an attempt to assess the long-term effects on material welfare resulting from the dramatic changes, probably unparalleled in human history, which occurred in the Americas after 1492. Bio-archaeological research has produced some evidence, though limited, that generally offers a rather pessimistic view of late pre-Columbian physical living standards.[88] According to Márquez et al., two conclusions may be drawn from previous research on statures in pre-Hispanic Mesoamerica: 'First, the existence of a northeast to southwest gradient in average stature ... and second, a trend toward diminishing height over time.'[89] Our findings are consistent with the long-lasting gradient observed across Mesoamerican regions. They also seem to support the hypothesis that the trend toward diminishing height was interrupted somewhat or reversed in certain areas at some point after 1492, since eighteenth-century

[86] Challú, 'The Great Decline', p. 53.

[87] Komlos and Küchenhoff, 'The Diminution of the Physical Stature', p. 55. See also José-Miguel Martínez-Carrion, 'La talla de los europeos, 1700–2000: ciclos, crecimiento y desigualdad', *Investigaciones de Historia Económica/Economic History Research*, 8: 3 (2012), pp. 176–87.

[88] Barry Bogin and Ryan Keep, 'Eight Thousand Years of Economic and Political History in Latin America Revealed by Anthropometry', *Annals of Human Biology*, 26: 4 (1998), pp. 333–51; Lourdes Márquez and Andrés del Ángel, 'Height among Prehispanic Maya of the Yucatán Peninsula: Reconsideration', in Stephen M. Whittington and David L. Reed (eds.), *Bones of the Maya: Studies of Ancient Skeletons* (Washington, DC: Smithsonian Institution, 1997), pp. 62–77; Lourdes Márquez, Robert McCaa, Rebecca Storey and Andrés del Ángel, 'Health and Nutrition in Pre-Hispanic Mesoamerica', in Steckel and Rose (eds.), *The Backbone of History*, pp. 307–40; Rebecca Storey, Lourdes Márquez and Vernon Smith, 'A Study of Health and Economy of the Last Thousand Years', in Steckel and Rose (eds.), *The Backbone of History*, pp. 283–306.

[89] Márquez et al., 'Health and Nutrition in Pre-Hispanic Mesoamerica', p. 320. Mesoamerica might have not been exceptional. In Europe, a fall in the average physical stature at least since the sixth century is perceptible: see Nikola Koepke and Joerg Baten, 'The Biological Standard of Living in Europe during the Last Two Millennia', *European Review of Economic History*, 9: 1 (2005), pp. 61–95. The decrease in height appears to have been widespread across European regions and especially large (almost 7 cm) in the best-documented case, that of Scandinavia and the North Atlantic, from the Middle Ages until the nineteenth century: see Richard H. Steckel, 'New Light on the "Dark Ages"': The Remarkably Tall Stature of Northern European Men during the Medieval Era', *Social Science History*, 28: 2 (2004), p. 216. A similar pattern arises for Japan, according to Yoshisuke Hiramoto, 'Secular Changes in Japan since Prehistory', *Journal of Anthropology Society of Nippon*, 80 (1972), pp. 221–36.

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 would need to be found. Increased access to animal proteins might be an important factor, but neither a higher level of productivity of the whole economy nor lesser economic inequality in Mexican society after 1521 should be overlooked. We agree with John Coatsworth that the introduction of new crops and, especially, new animals, facilitated by the demographic catastrophe of the indigenous population, brought about substantial gains in the productivity of the domestic-use agricultural sector in Mesoamerica during the first century of Spanish rule.[90] Those gains might well have been more long-lasting than Coatsworth claims, especially in central and northern New Spain, and they were probably even bigger than assumed if the symptoms of crisis in the economy of the late Mexica Empire (overpopulation, famines, extra mortality) mentioned by Knight and Semo are taken into account.[91] 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'.[92] Moreover, Steckel's view on health and nutrition in pre-Columbian America is rather pessimistic and may help us to see the post-Columbian period in a new light.[93] Regarding inequality, Steckel finds anthropometric evidence which points to an extremely unequal distribution of work effort and access to food in highly stratified pre-Columbian societies in Central America.

In our interpretation, data and inferences from the anthropometric approach to biological well-being in Spanish America from a very long-term perspective do not seem to support the notion of a 'reversal of fortune' in New Spain after 1520.[94] The transfer of Western technology (cranes, crafts, mills and so on), the increasing availability of draught animals and a growing presence of proteins in the diet ought to have reduced the biological stress suffered by pre-Columbian populations in Mesoamerica.

[90] Coatsworth, 'Inequality, Institutions and Economic Growth'.

[91] Alan Knight, *Mexico: From the Beginning to the Spanish Conquest* (Cambridge: Cambridge University Press, 2002); Enrique Semo, 'Los orígenes: de los cazadores y recolectores a las sociedades tributarias', in Semo (ed.), *Historia económica de México*, vol. 1 (Mexico City: UNAM-Océano, 2006).

[92] Jeffrey G. Williamson, 'History without Evidence: Latin America Inequality since 1491', paper presented at the mini-conference 'A Comparative Approach to Inequality and Development: Latin America and Europe', Madrid, 8–9 May 2009, p. 20.

[93] 'This article and other work in anthropometric history suggest that the poor nutrition of many native populations, including those rapidly conquered, has been overlooked': Richard H. Steckel, 'Health and Nutrition in Pre-Columbian America: The Skeletal Evidence', *Journal of Interdisciplinary History*, 36: 1 (2005), p. 29.

[94] Acemoğlu, Johnson and Robinson, 'Reversal of Fortune'.

Useful as it is, however, our approach to the study of the biological welfare of Spanish American common people presents some of the limitations that may affect the literature on anthropometric history more broadly: a lack of information on the female population; the unknown degree of influence of genetics on heights; missing data for sections of the population studied; and estimating with truncated distributions due to minimum height requirements for militia service. In spite of these problems, this is a first step towards placing Bourbon America in the international picture of living standards from a double comparative perspective (wages and heights).

Final Remarks

This paper presents a partial revision of some widespread assumptions regarding the economic history of Bourbon Spanish America. By doing so, it shares some basic characteristics with a small, albeit expanding literature.[95] This emergent revisionism departs from the very pessimistic judgements about Spanish America's economic performance from conquest to independence that permeate mainstream scholarship.

By studying wages of unskilled workers and physical statures in Bourbon Spanish America from an international comparative perspective, this paper attempts to widen 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., our results do not support the idea of low living standards among wage earners in Bourbon Spanish America.[96] The purchasing power of wages in Bourbon Spanish America, not only in terms of grain but also for superior goods (meat and sugar), was similar to or, not infrequently, higher than in many parts of the world, including most of Europe. Asian wages and living standards lagged behind those in Spanish America. A declining trend in real wages at the end of the Bourbon period can be 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

[95] Prados de la Escosura, 'Inequality and Poverty' and 'Lost Decades'; Grafe and Irigoin, 'The Spanish Empire and Its Legacy'; Alejandra Irigoin, 'Las raíces monetarias de la fragmentación política de la América española en el siglo XIX', *Historia Mexicana*, 59: 3 (2010), pp. 919–79; 'Bargaining for Absolutism'; and 'Gresham on Horseback'; Dobado-González and García-Montero, 'Neither So Low nor So Short!' and 'Colonial Origins of Inequality'; Dobado and Marrero, 'The Role of the Imperial State'.

[96] Allen, Murphy and Schneider, 'The Colonial Origins of the Divergence'.

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 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 principally a post-independence phenomenon. In fact, results presented in this paper, as well as in our earlier work,[97] cast some doubts on the accuracy of the figures for GDP per capita estimated by Coatsworth and Maddison for the late pre-independence period, which might be biased downward.[98] Regarding inequality, this paper does not imply – and nor do others such as Coatsworth and Williamson claim – that, in opposition to Engerman and Sokoloff, it has colonial origins.[99] Comparatively medium to high wages and biological living standards do not fit well with the idea of extreme inequality. Especially telling in this respect is the case of miners in New Spain and Upper Peru, supposedly the epitome of colonial exploitation.[100] Labour was not only, or mainly, obtained through 'extractive institutions', but instead, during the Bourbon period, resulted increasingly from an institution of 'private property' that did not exist before 1492: a market for wage labour.

We are aware of the limitations of this first attempt at studying economic and biological living standards jointly in Bourbon America. The next step in this research will therefore consist of broadening the database of wages, prices and heights in order to check whether our results prove to be robust to changes in the period 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.

[97] Dobado-González and García-Montero, 'Neither So Low nor So Short!' and 'Colonial Origins of Inequality'.

[98] Coatsworth, 'Inequality, Institutions and Economic Growth'; Maddison, 'Statistics on World Population'.

[99] Coatsworth, 'Political Economy and Economic Organization' and 'Inequality, Institutions and Economic Growth'; Jeffrey G. Williamson, 'Five Centuries of Latin American Inequality', NBER Working Paper no. 15305 (2009); Dobado-González and García-Montero, 'Neither So Low nor So Short!' and 'Colonial Origins of Inequality'; Engerman and Sokoloff, 'Factor Endowments, Institutions', 'Factor Endowments, Inequality' and 'Colonialism, Inequality'.

[100] More details on the labour conditions of miners in New Spain can be found in Dobado and Marrero, 'The Role of the Imperial State'.

Spanish and Portuguese abstracts

Spanish abstract. Este artículo ofrece nueva información cuantitativa sobre los niveles de vida en la América borbónica mediante el estudio de salarios y estaturas. Ni los salarios ni las estaturas eran bajas en términos comparativos internancinales, Europa incluida. Como en muchas partes del mundo occidental, los salarios reales tendieron a deteriorarse al final del período estudiado. Nuestros resultados sugieren que la 'Gran Divergencia' en niveles de vida entre los países occidentales desarrollados podría haber ocurrido principlamente después de la independencia y que los PIB per capita disponibles podrían estar infraestimados.

Spanish keywords: niveles de vida, salarios, estaturas, América borbónica, historia antropométrica

Portuguese abstract. Este artigo oferece novas evidencias quantitativas acerca dos níveis de qualidade de vida na América bourbônica a partir de um estudo pioneiro que abrange salários e estaturas. Pelos padrões internacionais da época, salários não eram baixos, tampouco as estaturas das pessoas. Os padrões de vida de hispano-americanos podem portanto ser comparados de maneira favorável a outras regiões do mundo, incluindo a Europa. Assim como em várias regiões do ocidente, pode-se observar uma tendência em direção à redução dos salários reais na América espanhola no final do período. Nossas conclusões sugerem que a 'Grande Divergência' nos padrões de vida entre a América espanhola e os países desenvolvidos ocidentais pode ter ocorrido principalmente após a independência e que as atuais estimativas de PIB per capita podem ser demasiado baixas.

Portuguese keywords: padrões de vida, salários, estaturas, América bourbônica, história antropométrica