



The transformation of labor supply in the pre-industrial world

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ABSTRACT

In pre-industrial economies labor supply curves bent backwards at very low levels of income. This changed in England before the industrial revolution (de Vries, 1994, 2008; Voth, 1998). Using a model of labor supply where consumption takes time, this paper shows that both an increase in the cost of subsistence and a fall in the price of time-intensive consumption could have generated an increase in hours worked but that only the latter would lead to an increase in the elasticity of labor supply. This model clarifies the role played by consumption in the behavior of labor on the eve of the onset of modern economic growth, distinguishing between an increase in hours worked caused by changing patterns of demand [the case of England] and an increase in hours worked caused by involution [the case of Italy and possibly Japan].

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1. Introduction

In 1930, John Maynard Keynes predicted that sustained economic growth would lead to the rise of an ever larger leisured class. Once this occurred work would be 'as widely shared as possible . . . three hours a day is quite enough to satisfy the old Adam in most of us!' (Keynes, 1963, 369). Implicit in his reasoning was an assumption that free time was a superior good. Keynes's suppositions about the prospects for sustained economic growth were broadly accurate; his predictions about the future of work were not.¹

Observers in pre-industrial Europe shared Keynes's view that leisure was a superior good. Writing in 1625, John Hagthorpe declared that it was 'the nature and condition of the English' to rather 'liue at ease by the sweat of others, than to sweate thrice a weeke to liue well by the labor of themselves' (Hagthorpe, 1625, 24). Thomas Mun held that English workers enjoyed the 'fruits of idleness' and drew unfavorable an comparison with the 'endeavours of the industrious Dutch' (Mun, 1664, 72). Ricardo (1950, 1817) writing a century and a half later, however, took the industriousness of the English worker for granted. He wrote '[g]ive to an Irish laborer a taste for the comforts and enjoyments which habit has made essential to the English laborer, and he would be then content to devote a further proportion of his time to industry, that he might be enabled to obtain them' (Ricardo, 1950, 1817, 100). What had changed? Recent work in economic history suggests that an 'industrious revolution' took place between 1600 and 1800 and that this transformation played a crucial role in enabling western Europe to achieve sustained economic growth after 1800 (de Vries, 1994, 2008).

This paper addresses this transformation in workers' labor supply by using a model built on Becker's (1965) theory of time use. The contribution of the paper is threefold. First, it demonstrates that the insights of de Vries (1994, 2008) and Voth

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¹ See the discussions contained in Pecchi and Piga (2008).

(2001b) into the character of the industrious revolution can be micro-founded in a model of labor supply. Second, this model clarifies the historical debate over the concept of an industrious revolution by distinguishing between an optimistic account advanced by de Vries (1994) of an industrious revolution driven by changing patterns of demand, and a pessimistic account as suggested by Van Zanden (1999). Finally, this enables us to assess whether or not other parts of the world, in addition to England, underwent similar industrious revolutions during the period before the industrial revolution.

This paper also sheds light on two other issues: the role played by consumer demand in the industrial revolution; and the role played by trade. Gilboy (1936) and Eversley (1966) argued that consumer demand played a central role in stimulating the British industrial revolution. Moykr (1977) demonstrated that simple general equilibrium considerations precluded an increase in demand from being a causal factor in growth. However, Moykr noted that 'it can indeed be maintained that demand factors mattered insofar as the supply of labor, the demand for leisure, and the demand for goods are simultaneously determined. If there was an increase in the "demand for income," economic growth would occur, but only at the expense of leisure' (Moykr, 1977, 985). By formalizing the insights of de Vries (1994) and Voth (1998, 2001b), this paper revisits this question.

The role trade played in the onset of modern economic growth is the subject of considerable dispute amongst economic historians ([as surveyed in Harley, 2004]. O'Brien (1982) showed that overseas trade and particularly trade with the periphery played a quantitatively small role in the eighteenth century English economy. However, the relatively small sector based on colonial trade could have had a disproportionately indirect large effect as Findlay and O'Rourke (2007) argue.² By analyzing how labor supply decisions depend on the relative prices of consumer goods, the analysis contained in this paper suggests how the arrival of new consumption opportunities in the form of colonial goods such as tea and sugar could have changed the labor/leisure calculus faced by workers, thereby playing a key role in laying the foundations for subsequent economic growth.

This article is organized as follows. Section 2 introduces the concept of an industrious revolution and explains its significance within the recent historical debate on the origins of modern economic growth and the great divergence. Section 3 presents a model of time-use and labor supply. In the model a distinction is made between leisurely consumption activities and intense consumption activities. Section 4 applies the predictions of this model to the historical evidence assessing the extent to which different processes could have driven labor intensification in England, Italy and Japan. Section 5 concludes.

2. The industrious revolution

2.1. Idleness in the pre-industrial world

In the seventeenth century, economic writers thought the labor supply schedule bent backwards at very low levels of income.³ This view is reflected in the following quotation from Bishop Pilkington in the early sixteenth century:

'The laboring man will take his rest long in the morning; a good piece of the day is spent afore he comes at his work; then must he have his breakfast, though he have not earned it, at his accustomed hour, or else there is grudging and murmuring . . . At noon he must have his sleeping time, then his beaver in the afternoon, which spendeth a great part of the day; and when his hour cometh at night, at the first stroke of the clock he casteth down his tools, leaveth his work, in what need or case soever the work standeth' (quoted in Thomas, 1964, 61).

It was not merely that workers displayed a taste for leisure; labor supply was also seen as highly inelastic. Bernard Mandeville observed of the mass of workers, that 'if by Fours Days labor in a Week they can maintain themselves, will hardly be persuaded to work the fifth' (Mandeville, 1924, 1723, 509). Sir Joshua Childs argued that the poor 'just work so much and no more, as may maintain them in that mean condition to which they have been accustomed' (quoted in Hutchinson, 1988, 59). Higher wages did not induce workers to work harder or longer.

While Keynes speculated about how our future selves would enjoy our leisure hours, writers during the seventeenth and early eighteenth century were seriously concerned. The industriousness of workers was seen as a source of wealth and national power. In his *Observations upon the United Provinces of the Netherlands*, written in 1668, Sir William Temple lauded the virtues of the Netherlands where 'the Multitude of the People' 'has planted and habituated industry among them'. However, he noted that 'men naturally prefer ease before labor, and will not take pains if they can live idle' (Temple, 1740, 61–64).

Low wages were held to be the solution to the problem of idleness.⁴ The anonymous author of *The Trade of England Revived; and the Abuses of Thereof Rectified* (1681) went so far as to argue in favor of regressive taxation on food and drink in

² There are several possible channels. Acemoglu et al. (2005) argues that Atlantic trade shaped institutional developments in England and the Netherlands. In more recent work, O'Brien (2001) emphasizes the role played by British control of Atlantic trade in the growth of the British state. Allen (2009) argues that the growth of British overseas trade during the seventeenth and eighteenth centuries was a pre-condition for the industrial revolution. This paper sheds light on one mechanism through which this might have been the case.

³ Surveys of this view are provided by Coleman (1956); Hill (1964); Appleby (1976); Blanchard (1978); Rule (1981); Himmelfarb (1984); Hatcher (1998).

⁴ This view is summarized by Weber (1930) who commented that '[f]or centuries it was an article of faith, that low wages were productive, i.e. that they increased the material results of labor' (Weber, 1930, 24). According to Walter Raleigh '[h]unger and poverty make men industrious' (quoted in Hill, 1964, 122). Similarly Mun argued that 'penury and want do make a people wise and industrious' (quoted in Hatcher, 1998, 77).

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