

The Hours of Labour and the Problem of Social Cost

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In "The Problem of Social Cost," Ronald Coase (1960) examined one variety of presumed market failures – outcomes that Cecil Pigou (1952) had described as “incidental uncharged disservices” (or uncompensated services) but are now commonly referred to as "externalities." The incidental quality of these effects makes them a social cost. The economic analysis Coase challenged and the standard examples he re-examined were taken from Pigou's discussion in part II of *The Economics of Welfare*. Coase argued that the suggested courses of action in the Pigovian tradition – liability, taxation or regulation – were inappropriate and often undesirable.

Coase claimed that the traditional approach to the problem of social cost "tended to obscure the nature of the choice that has to be made" (1960, 2). He characterized the question posed by the approach as "one in which A inflicts harm on B and what has to be decided is: how should we restrain A?" He objected that the problem was really a reciprocal one and the real question should be "should A be allowed to harm B or should B be allowed to harm A? The problem is to avoid the more serious harm."

However, Coase didn't consider the full range of Pigou's examples and analysis. While Coase's restatement of the problem may have been appropriate to the specific externality problems discussed by Pigou in part II, it entirely overlooked the radically different labour-market problem encountered in part III, in which competitive pressure compels an employing firm to inflict harm on *both* itself and its employees and thus regulatory restraint of the firm (and competing employers) may benefit both.

Along with the majority of the preceding Pigovian tradition, Coase evaded the thorny questions of working conditions and unemployment. Whatever gains in tractability may be accomplished by such a maneuver are more than offset by a forfeit of realism and of insight into the complex interdependency of economic factors in the long period. The determination

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of the hours of work provides a particularly compelling example of a circumstance in which mutual benefit could result from an imposed non-market restraint.

In part III of *Economics of Welfare*, Pigou argued that "after a point, an addition to the hours of labour normally worked in any industry would, by wearing out the work people, ultimately lessen rather than increase the national dividend" (1952, 462). That observation derives from the theoretical exposition performed by another of Alfred Marshall's star pupils, Sydney J. Chapman. Chapman's theory of the hours of labour (1909) and his historical study of the Lancashire cotton industry (1904) that foreshadowed it offer a suggestive counter-example of the largely unrealized potential of Marshall's industrial economics. This paper argues that Chapman's analysis provides greater insight into the problem of social cost than does either Coase's or Pigou's.

As Chapman demonstrated, under competitive conditions, employers would tend to prefer hours of work that exceed the length that would be optimal for output. If an individual employer and workers were able to negotiate more optimal hours of work, it would involve a present investment by the employer in the workers' future productivity. Well-defined property rights to that future capacity could not be transferred to the employer and thus the arrangement could be upset by a future offer of higher wages from a competing employer.

If we assume an optimal length of working day of eight hours for a given technology, during which an average worker could produce nine units of output but a longer actual working day of ten hours, during which the same worker produces only eight units, then Table 1, below, illustrates in simplified fashion the dilemma confronting the progressive employer seeking to reduce the hours to the optimal level.

Table 1

Month	0	1	2	3	4	5... 12
Units of output	6.4	7.05	7.7	8.35	9	9
Cost per unit	15.63	14.18	12.99	11.98	11.11	12.29
Value of daily output	80.00	88.13	96.25	104.38	112.50	112.50
Daily pay	100.00	100.00	100.00	100.00	100.00	110.62
Difference (per day)	-20.00	-11.88	-3.75	4.38	12.50	1.88

At an hourly wage of \$10, the worker would receive a daily income of \$100, which would translate to a labor cost of \$12.50 for each unit of output. Now, assuming that the output on the first day of the change would drop in proportion to the reduction in hours, that it would

take four months after a reduction in hours for the productivity gains to be fully realized, and that the subsequent recovery and improvement in productivity would follow a straight-line path, an employer who continued to pay the old daily rate (to retain the workers) would incur a higher labor cost per unit of output during approximately the first two and half months of operation at the new schedule.

During that period, the employer would have invested a total of \$557 per worker, an average of around \$10 a day, in anticipation of future productivity gains. Due to the higher total output, the employer could eventually grant a wage increase but would need to retain a portion of the revenue from that increased output to recoup expenses from those first two and a half months. However, a competing employer, who had not invested the initial \$557, could hire away the now well-rested workers with a nearly 2 per cent larger wage premium. In the real world, where employers don't have perfect knowledge, there would be even greater uncertainty regarding the amount of the potential productivity gain and the time and expense it would take to achieve it. On the positive side, the workers might not be so eager to change jobs just for a wage premium.

Following Chapman, Pigou viewed market failure with respect to the hours of work as commonplace, observing that, "the evidence is fairly conclusive that hours of labour in excess of what the best interests of the national dividend require have often in fact been worked" (Pigou 1952, 465). The chapter on the hours of labour is one of two places in *The Economics of Welfare* where Pigou specifically called attention to the divergence between private net dividend and "the best interest of the national dividend" and consequently where there is "a *prima facie* case for public intervention" (p. 331).

Pigou's "Hours of Labour" and Chapman's

Pigou's analysis of the hours of labour in *The Economics of Welfare* closely followed five main points of the theory Chapman had presented in 1909 in his presidential address to the Economics and Statistics section of the British Association for the Advancement of Science, subsequently published in the *Economic Journal* as "Hours of Labour." In his analysis, Chapman had referred to a mass of evidence from the 19th century indicating that reductions in the hours of work had not led to proportionate declines in output and, instead, had often led to increases. The reduction of hours allowed better rested workers to produce as much or more in shorter hours. Pigou inferred from the same evidence "that hours of labour in excess

of what the best interests of the national dividend require have often in fact been worked” (465) In part, this is because, "after a point, an addition to the hours of labour normally worked in any industry would, by wearing out the workpeople, ultimately lessen, rather than increase, the national dividend" (462), but also because competition (along with their own “short-sightedness”) would tend to compel employers to exceed that point at which additional work diminishes output over the long run.

Both economists referred to the several complicating factors but arrived at the same conclusion regarding a hypothetical optimal length of working day. For Pigou, the "essential point" was that "in each several industry, for each class of workers there is *some* length of working day the overstepping of which will be disadvantageous to the national dividend" (464). Similarly, Chapman had concluded that beyond a certain point, each additional hour of work would contribute to the current day's total output but at the expense of the following (and subsequent) day's capacity for effort. The intensity of the work involved, along with the average characteristics of the individual workers, would dictate the point at which cumulative output would begin to decline and thus the length of the optimal working day.

The historical evidence also contradicts a standard assumption that self-interest will lead employers and employees to pursue an optimal working day, from each of their perspectives and to negotiate a compromise. Chapman's analysis explained why competition would tend to produce excessively long days. Workers would choose a day longer than was prudent for their welfare because the prospect of unemployment would cause them to give higher consideration to immediate earnings than to their long-term earning capacity. Similarly, because well-rested workers could be lured away by an offer of higher wages from another firm, an employer could never be certain of benefiting from the short-term restraint that maintaining an optimal workweek would require.

Pigou explained the presumed market failure as follows: "workpeople, in considering for what hours per day they will consent to work, often fail to take account of the damage unduly long hours may do to their efficiency" (466). In the case of employers, they "also often fail to realise that shorter hours would promote efficiency among their workpeople, and so would redound to their own interest." Furthermore, "except in firms which possess a practical monopoly in some department of industry, and so expect to retain the same hands permanently, the lack of durable connection between individual employers and their

workpeople makes it to the employers' interest to work longer hours than are in the long run to the interest of production as a whole."

The Marshallian Realism of Chapman's *The Lancashire Cotton Industry*

Chapman's analysis of the hours of work was acknowledged as both novel and canonical (Hicks 1932, Marshall 1920, Robbins 1929). Pigou's presentation can thus best be regarded as an accurate paraphrase of that theory that was lax in fully crediting its source. That characterization is more than a pedantic quibble over originality and citation because of crucial differences in methodology between Chapman and Pigou. Chapman's theory evolved out of what Marshall called his "realistic-impressionist" scholarship on the Lancashire cotton industry – a method of inquiry that Marshall upheld as more suitable to the subject matter than the abstract, "statical" method employed by Pigou.

The Lancashire Cotton Industry (Chapman 1904) was a self-conscious application of Marshall's theory of industrial localization. According to Raffaelli (2004), it was one of two "very promising steps towards the establishment of a Marshallian school of industrial economics [...]" (211). Chapman's later theory of the hours of labour, published in 1909, retains distinctive marks of influence from his "realistic-impressionist" study of the Lancashire cotton industry. Recapping his hours of labour analysis, Chapman (1911) specified that the ultimate efficiency gains from a shorter working day were "long-period results, which may not be fully realized, and [...] are apt to be overlooked by everybody" (342).

In the preface to *The Lancashire Cotton Industry*, Chapman explained that the "different guiding notions" of employers and employed were a "striking feature in the history of the Cotton industry [...]" (p. ii). Some of the most compelling of those notions had to do with the hours of work and the agitation for shorter hours. Instead of relying on an abstract analysis of the economics, Chapman scrupulously investigated the workers' and employers' own view of the question. Chapman had been exposed to the pamphlet literature of the early English socialist writers, many of whom were involved in labour struggles in Lancashire, through his studies at Cambridge with Herbert Foxwell. An extensive select bibliography in the Lancashire study is reminiscent of Foxwell's (1899) bibliography for *The Right to the Whole Produce of Labour*, including the apologetic tone of the introductory remarks. Chapman's

astute observations on the views of the advocates and opponents of the Ten Hours Bill foreshadowed his later theoretical treatment of the hours of labour:

Sound as were the fundamental ideas for the realization of which the Society for National Regeneration had been instituted, its propaganda were frequently vitiated by appeals drawn from the doctrine of the labour fund, as the "lump of labour" fallacy might be called [...]. We must notice, however, that those who advocated shorter hours, both in this period and later, found also many sound reasons for their action in the expected effect on the health and comfort of the operatives. They perceived that high wages were of little value to those who had little time to spend them. Moreover, the mistakes made by the operatives lay not so much in their fundamental opinions as in some of the reasons given by them for holding these opinions (98).

Looking back at that assessment from the perspective of his 1911 recap of his 1909 theory of the hours of labour, one might conclude that what Chapman perceived as the "fundamental ideas" of the advocates of shorter hours hearkened to the *long-period results* of the measures rather than the propagandistic appeals to immediate effects. In "Hours of Labour," Chapman presented a similar contrast between the guiding "ideals of life" and possibly fallacious views about "the mechanics of distribution":

It would seem from the records of labour movements as if the operative's fear – based as much on ignorance as on distrust – lest the longer day should mean no more pay, though the weekly product would be greater, has protected him against the injurious consequences of short-sightedness; but I am inclined to think that the dominant force in these labour movements has consisted in ideals of life, formed half instinctively, which are unconnected with views, fallacious or otherwise, concerning the mechanics of distribution. Bad arguments have been used to justify good ends (365).

Marshall wrote to Chapman, praising his book as "the best monograph of the kind that has ever been published. It is both a realistic-impressionist study of human life and an economic treatise" (Whitaker 1996, 93). By contrast, the comments Marshall left in the margins of his personal copy of Pigou's *Wealth and Welfare* (1912) express unease with Pigou's overestimation of "the possibilities of the statical method" (Bharadwaj 1972, 33). In his

Industry and Trade, Marshall (1919) again displayed diffidence about the broader applicability of the mathematical analysis inherent in the "brilliant work of Edgeworth and Pigou [...]" (605). Marshall cited Chapman's Lancashire study with approval three times in *Industry and Trade*, along with two other works by Chapman while only mentioning Pigou twice, both times in connection with Edgeworth and without citing any specific texts.

For Marshall, realism was not simply a matter of relaxing the constraints of simplifying assumptions that had been imposed on an abstract hypothesis. According to Chapman, Marshall viewed theory and realism as "two lines of investigation" that converged. The evolution of actual economic practices was not something that could be deduced from abstract principles. It needed to be documented through historical investigation and the collection of facts. Chapman's study of the Lancashire cotton industry strove for just such a convergence of realism and hypothesis.

In "Distribution and Exchange," Marshall (1898) outlined what he saw as the limits to mathematical, abstract analysis. In that article he explained that although the mechanical analogy with its *ceteris paribus* assumptions may indeed be suitable for the short period, it is entirely *unsuitable* for the long-period analysis in which the *cumulative* effects of external economies predominate: "If we include in our account nearly all the conditions of real life, the problem is too heavy to be handled; if we select a few, then long-drawn-out and subtle reasonings with regard to them become scientific toys rather than engines for practical work" (52). He argued that it is even more important to know when to quit an analogy than when to introduce one because they can become an obstacle to judgment in the long period. In place of mechanical analogies, Marshall prescribed "biological" analogies for the investigation of long-period phenomena.²

Marshall's notion of external economies – whose cumulative change in the long period ruled out the broader applicability of mechanical analogies – evolved into incidental uncompensated disservices or uncharged services and eventually became abbreviated as

² Exactly what Marshall meant by biological analogies, other than a more inductive approach, is beyond the scope of this paper.

negative and positive externalities.³ Those external economies, though, could hardly be bundled into packages of well-defined property rights and traded on the futures market like any other commodity. Instead, even though they may be negligible for the purposes of short period analysis, they are integral to the evolution of industrial organization.

In 1932 J. R. Hicks posited a condition for sidestepping, in analytical technique if not in basic theory, the type of market failure indicated in Chapman's theory and reiterated in part III of Pigou's *Economics of Welfare*. Hicks conjectured that a "very modest degree of rationality on the part of employers will thus lead them to reduce hours to the output optimum as soon as Trade Unionism has to be reckoned with at all seriously [...]" (217-18). Hicks thus introduced an analytical simplification that was actually more of a *complication* – and an institutionally contingent one at that. Moreover, he did it in the name of "think[ing] back our arguments into a more cumbersome but more realistic form [...]" (93). Hicks's notion of realism was strikingly at odds with Chapman's or Marshall's.

Restoring the Elided Long-Period View

A narrative ellipsis haunts discussion of the problem of social cost and contemporary labour economics in a way that few acknowledged sources could hope to. What I mean by "ellipsis" is not simply an absence of influence but an odd sort of semi-presence that leaves out precisely the most salient details. Pigou left out explicit credit to Chapman for the theory of the hours of labour. The Pigouvian tradition, including Coase's critique of that tradition, disregarded that key part of Pigou's welfare economics that relied on Chapman's theory. The elided influence of Chapman extends also to Hicks's procedure for evading the serious complication introduced by Chapman's theory. Contemporary economic analysis proceeds *as if* the given hours of work are optimal for output, an assumption that can be traced directly to Hicks (Nyland 1989, Walker 2007b).

A third instance of ellipsis occurs precisely at the intersection of social cost and labour economics, in what John Maurice Clark termed the "social overhead cost of labour." Stabile (1995, 1996) has highlighted the affinities between *Studies in the Economics of Overhead*

³ "An external economy or diseconomy of production arises when the production of a commodity gives rise to incidental uncharged services or uncompensated disservices to a third party who is neither producer nor consumer" (Knox 1960).

Costs (Clark 1923) and *The Economics of Welfare*, paying particular attention to Clark's analysis of the shifting of the fixed costs of labour, which explicitly incorporates Pigou's observations (in part derived from Chapman) of the effects on future efficiency of unemployment and poor working conditions.

Nearly 40 years later, Walter Oi (1962) took up the theme of "the treatment of labor as a quasi-fixed factor," a concept Oi attributed to "J. M. Clark, who dealt primarily with the social cost of unemployment" (554). Following Oi, the notion of fixed costs underwent a remarkable inversion. Instead of referring to the cost of sustaining each worker, regardless of whether employed or not, it has become an employment cost (e.g., "fringe benefits") that doesn't vary with hours worked. The aspects of cost shifting and of social cost have been omitted. Instead, the existence of these fixed, per employee costs has become a stock rationale for why reducing the hours of work, by "increasing the overtime premium does not appear to be an effective method of decreasing unemployment" (Ehrenberg 1971, 206).

In each case – social cost, optimal hours of work and fixed costs – the contemporary version has left out the core substance of Chapman's analysis. It is precisely the long-period, cumulative results of external economies that are ignored. These are not theoretical advances but detours around theory, bolstered by vague impressions that predictions based on the truncated models have been empirically verified. But these "empirical proofs" may consist of nothing more substantive than speculative assertions supplementing empirical analysis rather than the results of the analysis itself. In the case of Ehrenberg conclusion cited above, for example, his sentence began with the disclaimer, "Our own personal view [...]!"

"In economics," wrote Paul Samuelson (1951, cited in Boyer and Smith 2001, 207) "it takes a theory to kill a theory; facts can only dent the theorist's hide." Milton Friedman (1953, cited in Boyer and Smith 2001, 207) further argued that it wasn't the realism of a theory's assumptions that mattered but the quality of its predictions. But in the absence of faithful attention to the history of economic thought, who is to say what the theory actually said, what in fact it predicted and whether the empirical analysis confirmed the prediction?

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