Comment on: "Centralized Bargaining and Reorganized Work: Are they Compatible?"

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Introduction

Lindbeck and Snower (2001) investigate the effects of multitasking and teamwork on the viability of centralised bargaining. The authors emphasize that workers likely have private information concerning their task mix when multitasking plays a significant role in the production process. They try to show in a formal model that only a complex remuneration scheme provides incentives for workers to choose an optimal task mix and suggest that centralized wage setting cannot tackle this complexity.

Unfortunately the authors miss to specify and analyze the basic assumption regarding private information of the workers explicitly. A closer inspection of the issue reveals that – contrary to the claims of the authors – the wage scheme resulting from their model is either not necessary or not implementable for the relevant information structure and therefore *does not solve the considered information problem.* We start with a short summary of Lindbeck & Snower's model, followed by a discussion of the relevant information structure and the central problem of their model. The rest of the comment is devoted to some remarks on the role of teamwork and multi-tasking within firms.

A short summary of the model

Lindbeck & Snower consider the profit maximization problem of a firm whose production function $q(\lambda_1, \lambda_2)$ requires two labour inputs (tasks) in quantities λ_1 and λ_2. These tasks are performed by two types of workers. Workers of each type can perform *both* tasks. According to the Lindbeck & Snower terminology, a holistic firm is characterized (and distinguished from tayloristic firms) by the fact that both worker types perform both tasks in a production optimum but type 1 workers have a *comparative advantage* in performing type 1 tasks in the sense $e_1/e_2 > E_1/E_2$ where e_i denote efficiency units for type 1 workers when performing task i and E_i denote the corresponding measures for type 2 workers. In general, lowercase letters are used for type 1 workers and uppercase for type 2 workers. The e_i and E_i are functions of the task mix, i.e. $e_i = e_i(\tau), E_i = E_i(T)$ where τ and T denote the share of gross working time a worker devotes to task i.[1] Together with the definition of

[1] In the paper the functional dependence of the e_i and E_i is decomposed further in the form $e_i = e_i(s_i, c_i)$ where $s_1 = s_1(\tau)$ and $s_2 = s_2(t - \tau)$ denote the effects of *specialization* and complementarity on workers' productivity respectively. Again the specification of

the e_i and E_i and the production function a full representation of the model consists of the inputs

$$\lambda_1 = e_1 \tau n + E_1 (1 - T) N \quad (1)$$
$$\lambda_2 = e_2 (1 - \tau) n + E_1 T N, \quad (2)$$

the worker utility functions

$$u = w_1 \tau + w_2 (1 - \tau) + v(\tau) \quad (3)$$
$$U = W_1 (1 - T) + W_2 T + V(T) \quad (4)$$

and participation constraints

$$w_1 \tau + w_2 (1 - \tau) \geq v(\tau) \quad (5)$$
$$W_1 (1 - T) + W_2 T \geq V(T) \quad (6)$$
$$(7)$$

where $v(\tau)$ and $V(T)$ represent preferences of specialization/diversification.[2] In the formulas the $w_i, (W_i)$ denote wages for the respective tasks and $n, (N)$ the number of workers of type $1, (2)$. After substitution of the e_i and E_i, output can be written as

$$q = q(\tau, T, n, N)$$

and the cost function has the form

$$\kappa = \{w_1 \tau + w_2 (1 - \tau)\} n + \{W_1 (1 - T) + W_2 T\} N$$

By straightforward maximization of the profit function subject to participation constraints, Lindbeck & Snower derive a wage structure (from the maximizing values τ^*, T^*, n^*, N^*) where $w_1 \neq W_1$ and $w_2 \neq W_2$ in general if full specialisation does not occur (formally, if $0 < \tau^* < 1$ and $0 < T^* < 1$).[3] This means, for example, that type 1 and type 2 workers obtain different wages for performing task 1.

The authors conclude that this flexible form of wage setting is incompatible with central collective bargaining, since centralized wage setting does not allow such complex wage structures. To emphasize the problem they note that the number of tasks is much larger in most firms and the number of required wages rises quickly with the number of tasks and worker types. As noted above, the assumption that the task mix (i.e. the parameters τ and T in their terminology) cannot be observed by the employer (principal), is central for the model.

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the E_i is fully analogous (with uppercase symbols) $E_1 = E_1(S_1(1 - T), C_1(T))$. This is irrelevant for the main point and therefore ignored here.

[2] Of course, $v(\tau)$ and $V(T)$ must be negative.

[3] In the case of full specialization only two instead of four wages are needed.

The consistency problem

We anchor a discussion of the information structure with a quotation from Lindbeck & Snower's paper. On page 1860 they write:

> "An important aspect of multi-tasking, documented in the recent empirical literature, is that employees often have discretion over the proportions in which different tasks are performed. In practice, employers generally determine the range of tasks that each of their employees perform, while the employees often have some latitude in deciding the task mix... Beyond that, task mixing is usually difficult to monitor, and thus managers often have little alternative but to leave some of the decision making to the employees. Managers can, however, influence their employees decisions through wage incentives. These wage incentives may be distorted through centralized wage bargaining."

Several interpretations are possible here. In the simplest one (the hidden action case) the principal does not observe τ and T but has knowledge of all other entities. In other possible (and probably relevant) interpretions (the hidden information case) workers have private information over their preferences (relative disutilities associated with the tasks) or the efficiency unit functions e_i and E_i. Lindbeck & Snower's formal analysis is restricted to thee first (hidden action) case.

The central problem of the model can then be formulated in one sentence: Since τ and T appear in the remuneration functions, Lindbeck & Snower's wage scheme cannot be implemented. Put differently, opportunistic workers disregard wages in their utility optimisation problems and simply set $v'(\tau) = 0$ to obtain their optimum task mix if τ and T cannot be observed. Contrary to their claims, the authors set up and solve a fully deterministic model of symmetric information. In the deterministic case, however, the principal simply prescribes an optimum task mix for every type and determines wages (call them ω and Ω) such that they meet the participation constraints, e.g. $\omega := v(\tau^*), \Omega := V(T^*)$. In practice the problem *is* solved in centralised wage setting by specifying wages for a *typical* task mix instead of for all tasks separately. The number of wages to be determined is unaffected by this change. Of course, these standard wages are only approximations to a perfectly efficient choice. But it is quite naive to expect that a principal (or the market) is able to determine exact optimising wages for a firm with

10 worker types and 50 tasks (just try to compute the number of resulting wages!).

Is there a way to trick employees into choosing the optimal task mix when it is not observable? The standard advice from information economics is to make wages contingent upon output. If the principal ties remuneration to output, we have to specify whether he observes only gross output q of the whole labour force or individual outputs. The central role of multitasking and teamwork in the investigated issue is suggestive for the first alternative.[4] Then the results from Holmström (1982) apply. Holmström investigates a situation where output produced by a team of agents can be observed by all players but the individual contributions of the agents are private information. He shows that the team production moral hazard problem can be solved efficiently via a simple group punishment incentive scheme: If production equates the output attainable with the social optimum values of τ and T, the principal distributes gross revenues such that the wage of each worker is (at least marginally) above his disutility of effort $v(\tau^*)$ or $V(T^*)$. If it falls short this level, every worker gets nothing.[5]

Several observations are in order here. First, *Holmström's scheme does not require different wages for different tasks.* The earnings of each worker (strictly speaking: each worker type) depend on his disutility of effort and the number of wages equals the number of worker types. It suffices to set a severe group punishment and every worker (type) will choose the optimum task mix. Otherwise productivity would fall short of the objective and trigger group punishment.[6]

Put simply, hidden action and hidden information problems generate dependency of wages on output, but especially if teamwork and cooperation play a significant role in production, these remuneration schemes are rather simple, i.e. every worker group obtains one wage.

[4]For related models where individual outputs are observable but production of a workers depends on inputs of his colleagues see Holmström and Milgrom (1990).

[5]Holmström notes that this scheme is not the only viable and other solutions, for example bonding, are possible.

[6]The punishment scheme can be replaced by a bonus scheme. This is mainly a matter of semantics.

An alternative view of teamwork and multi-tasking

We conclude the comment by some remarks regarding the involved problems. Among its formal problems, Lindbeck & Snower's model is based on a one-sided and too a narrow view of flexibility, job-rotation, teamwork multitasking.

Firstly, though Lindbeck & Snower stress the importance of flexibility at the workplaces of holistic firms in the motivation of their model, they hide this central issue in the formal part by assuming a static environment (production function, product demand etc.) resulting in time-invariant optimum task mix parameters. In contrast, the relevant descriptive literature characterises holistic firms by permanently changig task mix parameters. Consequently the central question of such a model should be how to provide incentives for workers to respond themselves to changing production demands by selecting the necessary tasks. This issue is often not modelled explicitly in the information economics and efficiency wage literature as a matter of abstraction. Nevertheless the solutions in the literature apply exactly and in a selv-evident manner to the situation modelled by Lindbeck & Snower's paper.

Secondly, it should be clear that job rotation, teamwork and multitasking are *solutions* of the information problems of firms. Job rotation is a prerequisite for promotion in many firms. For future managers and leaders this is not only an opportunity to become acquainted with certain tasks but also to get some experience on mean work load, task-specific disutility of effort, specialization gains and synergies with other tasks. This information gathering function of job rotation is probably more important than learning specific tasks. And more importantly, task-mixing and teamwork *are also systems of mutual monitoring.* If every worker knows her colleagues' tasks from own experience, she will unmask false claims and shirking of her colleagues – at least if they imply disadvantages for her. Employees not complying with the concept of homo oeconomicus will do even more – in many cases to the benefit of the firm.

References

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