Modeling Management: Employee On-the-Job Behavior

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Last week's post called out mainstream New Keynesian theorists' for their universal assumption that labor management is best described by the long discredited drive system, rooted in arbitrary direct supervision. Of all macroeconomists' laughable assertions about what goes on inside firms, uber supervision is among the most scorned by practitioners. They marvel that macroeconomics, built on such fatuous foundations, can explain anything.

Small-Establishment Venue

Supervision-reliant management tends to be cost-effective in relatively uncomplex firms, where workplace information is symmetric. Rational employers influence OJB along two dimensions: (i) direct supervision that seeks to minimize feasible unit labor costs and (ii) managing voluntary turn-over in order to optimize firms' small specific human capital. (The notation used below is defined in Chapter 2 of the website's e-Book and in its Glossary.) SEV management, engaged in direct supervision unhampered by workplace-information problems, is an altogether different undertaking than that of their LEV counterparts.

Worker supervision. A simple model introduces endogenous SEV OJB monitoring into economic analysis:

$\acute{Z}^m_k = f(\check{S}_k)$, such that $\Delta \acute{Z}^m_k / \Delta \check{S}_k \geq 0$,

where $\check{S}$ denotes firm real outlays on workplace supervision. It follows that short-run (constant-capital stock) production is:

$X_k = X_k(H_k, \acute{Z}_k, \acute{Z}^m_k)$, such that $\Delta X_k / \Delta \check{S}_k \geq 0$.

The optimizing condition is familiar. The profit-seeking firm equates the marginal value of supervision to its unit cost.

In workplace-equilibrium modeling, the effectiveness of direct supervision is decreasing in workplace size as team production and specialization degrade the information that supports management's capacity to apportion productivity among interacting employees. In small, especially owner-managed firms, workplace oversight is frequently a joint product with other duties, implying low-cost, effective supervision. This is not a new idea. From Alfred Marshall (1891, p. 284): "The small employer has advantages of his own. The master's eye is everywhere; there is no shirking by his foremen or workmen, no divided responsibility, no sending half-understood messages backward and forward from one department to another."

Managing quits. The second class of management tasks is rooted in rational human-capital investment. The analysis is familiar and can be briefly summarized. Given that SEV worker discretionary workplace behavior is held constant by effective monitoring, the difference between a veteran employee's labor-services input, denoted by i, and the input of a (market-homogeneous) new hire, denoted by ή, is:

$\acute{Z}_{ik}((\acute{E}^Q/H)_{ik} + (\acute{E}^G/H)_{ik} + (\acute{E}^S/H)_{ik}) - \acute{Z}_{ńk}((\acute{E}^Q/H)_{ńk} + (\acute{E}^G/H)_{ńk}) = \acute{Z}_k(\acute{E}^S/H)_{ik}$,

where $E_{ik} = \acute{Z}_{ik}H_{ik} = (E^Q + E^G + E^S)_{ik}$. The replacement of a veteran worker with a new hire implies the loss of specific human capital for both the employee and the firm. For small establishments, $(\acute{E}^S/H)_k$ is reasonably posited to be a modestly sized, representing hiring and simple training costs. Those costs, once amortized, can fund only a small nonmarket wage premium, with which the firm manages its voluntary labor turnover.

The firm's profit-maximizing labor pricing is $W_k > W^m$, reflecting the rational payment of a small nonmarket wage

differential (γ^o_k):

$$W_k = (1+\gamma^o_k)W^m.$$

Given a reasonable distribution of work-leisure preferences in the *k*th workforce, the small size of γ^o implies that it is in practice dominated by other determinants of the employee intertemporal job-attachment decision rule. The simple model is consistent with substantial voluntary turnover.

Workplace equilibrium. Rational workplace exchange for SEV establishments is governed by:

$\acute{Z}_k=\acute{Z}_k(W_k,W^m,\acute{Z}^m_k)$, such that if $W_k \geq (1+\gamma^o_k)W^m$, $((\Delta\acute{Z}_k/\acute{Z}^m_k)/(\Delta W_k/(1+\gamma^o_k)W^m))$**$(1+\gamma^o_k)W^m$). The profit-seeking firm, therefore, effectively gauges its labor input ($\acute{Z}^m_k H_k$) by employee hours alone. Hours can be measured and priced in the marketplace.**

Antoine Augustin Cournot, the nineteenth century French mathematician and economist, famously argued that, as firms become small relative to the market, their capacity to influence product pricing disappears. In the 21st century, the generalization of rational exchange from the marketplace to the workplace has identified a significant companion characteristic. As firms become small, their employees' capacity to endogenously influence their wages disappears. The marketplace's ability to govern product and factor pricing depends substantially on production scale/complexity, drawing uncomfortable attention to the problematic design of economic models that suppress size-related technological heterogeneities.

Large-Establishment Venue

The GEM Project has demonstrated that, for LEV firms offering class-I jobs, workplace exchange is rationally unbundled:

$\acute{Z}_j=\acute{Z}_j(W_j, W^n_j, W^m, \acute{Z}^m_j)$**, such that if $W_j \in [W^n_j,W^m]$, $(\Delta\acute{Z}_j/\acute{Z}^n_j)/(\Delta W_j/W^n_j)>1$.**

The employer and employees simultaneously optimize labor pricing (at $W_j=W^n_j>W^m$) and worker OJB (at $\acute{Z}_j=\acute{Z}^n_j$). Profit-seeking management pays wage rents and jobs are rationed.

Worker firm-specific human capital, the high incidence of which is characteristic of LEV firms, is embodied in labor hours only in the employing establishment, making $\acute{E}^S_j$ independent of employees' market-opportunity cost. Optimizing management rationalizes its labor input along the two familiar dimensions:

  - **Optimizing $(\acute{E}^S/H)_j$ by managing employees' voluntary turnover; and**
  - **Optimizing $(\acute{E}/H)_j$ by managing workers' on-the-job behavior $(\acute{Z})_j$.**

Managing voluntary turnover. **The first class of management tasks is familiar from insider-outsider theories. In workplace-equilibrium theory, if employee discretionary OJB ($\acute{Z}$) is unchanged, the difference between a veteran employee's labor-services input and the input of a (market-homogeneous) new hire, denoted by $\acute{\eta}$, is:**

$\acute{Z}_j((\acute{E}^Q/H)_j+(\acute{E}^G/H)_j+(\acute{E}^S/H)_j)-\acute{Z}^{\acute{\eta}}_j((\acute{E}^Q/H)^{\acute{\eta}}_j+(\acute{E}^G/H)^{\acute{\eta}}_j)=\acute{Z}_j(\acute{E}^S/H)_j.$

The replacement of a veteran worker with a new hire implies the loss of specific human capital for both the employee and the firm. For large establishments, $(\acute{E}^S/H)_j$ represents the firm-specific knowledge necessary to support specialized production and substantially exceeds $(\acute{E}^S/H)_k$. The rational response is to curtail turnover by paying a wage premium:

$(1+\gamma^o_k)W^m 1)$ **that results from optimizing employee-employer behavior in the circumstances of costly, asymmetric workplace information. In the GEM model, as in practice, voluntary turnover is much lower in large, specialized establishments than in small firms.**

Managing behavioral efficiency. **Formal workplace analysis assigns a critical role to the wage-rent variant of the classic hold-up problem. It has been demonstrated that, as part of the ongoing employer-employee contest over residual rents, LEV management rationally invests in efficiently responding to the importance workers' attach to $\mathbb{K}_j$. Less emphasized in the Project's macro analysis, firms also invest in the capacity to influence the calibration of $\mathbb{K}_j$.**

Workplace-equilibrium modeling has identified two classes of actions that introduce malleability in $\mathbb{K}_j$ and, therefore, unit labor costs:

- Employment downsizing, eventually inducing rational employee $\mathbb{K}_j$ recalibration (derived from intertemporal choice balancing wage rents and job loss); and
- Technical change, broadly defined to include innovations in (a) products and production processes, (b) management methods and procedures for organizing employee OJB, and (c) contract design.

Technical change, typically held constant in workplace-equilibrium modeling, can alter workers' capacity to develop and maintain interpersonal and intertemporal reference standards and is at the heart of a more fulsome examination of the rational management of labor input in large establishments offering class-I jobs. (The topics will be considered later when the Blog resumes its series on modeling management.)

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