Ethical Sourcing – Production Scale and Monitoring:

Theory and Evidence

1. Introduction

In products ranging from low-tech (apparel and footwear) to high-tech (smartphones and laser printers), international outsourcing of production is ubiquitous. However, contract producers may evade social and environmental responsibility, or laws and regulations. To save costs, they may employ child labor or force overtime, use unsafe facilities, or pollute the air and waterways. Such irresponsible behavior affects global brands through bad publicity, loss of sales, and possibly even legal penalties.

Previous research has emphasized price incentives, certification, and auditing as mechanisms to motivate suppliers to behave responsibly (e.g., Chen and Lee 2016; Cho et al. 2016; Plambeck and Taylor 2016). Here, we investigate another mechanism – the scale of production (order quantity) – and the tradeoff between scale and monitoring as mechanisms to induce responsible behavior. Our research proceeds through both analytical modelling and empirical analysis.

Conventionally, manufacturing is assumed to exhibit economies of scale. Accordingly, previous research into ethical sourcing has normalized the scale of production to focus on mechanisms to induce responsible behavior. Yet, increasing the scale of production may not only reduce the unit cost of production, but it may also amplify the benefit from irresponsible behavior. Suppose, for example, that a factory can reduce the cost of production by 10 cents per unit through employing child labor. Then, child labor raises total profit by 10 cents multiplied by the scale of production. So, reducing the production scale would reduce the incentive for employing child labor.
The obvious and more direct way to ensure ethical sourcing is monitoring the suppliers. Therefore, we propose to investigate the management of ethical sourcing through the scale of production and monitoring, and particularly, the tradeoff between these two mechanisms.

2. Research methodology

In the theoretical analysis, we develop a stylized model comprising one supplier and one buyer (brand). The buyer offers a contract consisting of a wholesale price per unit, order quantity (scale), monitoring rate (frequency), and a penalty depending on the level of supplier evasion. If the supplier accepts the contract, it will choose the level of evasion to maximize profit, which consists of revenue (wholesale price multiplied by scale) less production cost (which depends on scale and evasion level), and less the expected penalty from monitoring. We endogenize the market price, and formulate the buyer’s profit as the revenue from sales plus expected monitoring penalty from the supplier less the expected monitoring cost, less wholesale payments to supplier, and less expected losses to the brand due to the supplier’s evasion.

To examine the insights from the model, we collect and analyze data from Nike, one of the world’s leading manufacturers of athletic footwear and apparel. Since the 1990s, Nike has been under pressure to correct working conditions and employment practices at contract factories. The data cover production and employment at Nike contract factories in China between 2013 and 2016. During this period, the number of factories ranged between 206 and 170, and the average factory employed 1278 workers. We represent the scale of production at each factory by the size of its workforce, and the cost of monitoring by the distance of the factory from the closest of the three national centres—Beijing, Shanghai, and Guangzhou, where monitoring teams are likely to be based.
In our estimates, we also control for provincial average manufacturing wages, product types and brand, and province and year fixed effects. For identification, we also include the interaction between distance and provincial legal institutions (the quality of legal and accounting service, protection of property rights, and number of lawyers).

3. Summary of results

Theoretically, we show that reducing the scale of production and monitoring are substitute mechanisms by which the brand can reduce the supplier’s incentive for irresponsible behavior. Hence, if monitoring is more costly, the brand will reduce monitoring and also reduce the scale of production. Our empirical analysis is consistent with the theoretical proposition that high monitoring and small scale are substitutes. Among Nike contract factories in China, workforce size (representing scale) is negatively correlated with distance from national centres (representing monitoring cost).

The empirical result is robust to representing the cost of labor by the minimum wage and representing the scale of production by the number of line workers. We also find that the provincial legal institutions positively moderate the negative relationship between scale and monitoring cost. In a province with better legal institutions, the cost of monitoring is lower, and so, the brand can use more monitoring to induce more responsible behaviour by the supplier.

References

