Case Study 9: The inner beauty of firms

Division of labour, span of control, and technology inside a salon

1 The work inside a salon

How is work divided among workers? What determines who does what? How much can a business gain from specialization? These questions have been central to economics since Adam Smith opened *The Wealth of Nations* with the division of labour in a pin factory. Jacob Kohlhepp (2025) asks them inside U.S. hair salons and barbershops.

Salons make the choices easy to picture. An appointment may combine a cut, colour, a treatment, and a blow-dry. Someone must book the visit, and the customer pays for the services. One stylist can do everything, or several workers can combine their skills. Sharing the work may improve the service, but it also takes scheduling and coordination. How much division of labour can a salon manage? Can technology help the manager coordinate a more specialized team?

Usually, researchers can see a business's sales and employment but have little information about the tasks performed by each worker. Here, salon management software records each service within a customer visit. Each entry identifies the salon, customer, service, worker, price, and duration; the software also records the appointment's date and time. Kohlhepp studies 10.8 million such entries from salons across the United States, with many observations in New York and California.

Exhibit 1 shows how a visit appears in these records. Blake requested a cut, highlights, and a treatment in salon 1A; Grace requested a cut and colour at another salon (2A) in the same zip code. Each service occupies its own row. The worker column shows whether the salon kept the visit with one stylist or divided it between workers.

Exhibit 1. Services recorded during two visits

Salon	Customer	Recorded service	Worker	Price	Minutes
1A	Blake	Advanced cut	Rosy	$100	72
1A	Blake	Full-head highlights	Rosy	$243	127
1A	Blake	Treatment add-on	Rosy	$39	72
2A	Grace	Women's cut	Tyler	$225	43
2A	Grace	Single-process colour	Ben	$200	77

Source: Kohlhepp (2025), Table 1, selected columns. Two appointments at salons in the same zip code; names and identifiers are pseudonyms.

Salon 1A gave all of Blake's services to Rosy. Salon 2A gave Grace's cut to Tyler and her colour to Ben. That division required a *handoff*: the two workers had to be available in the right sequence. These visits show two ways to organize a customer's services. Kohlhepp looks across all visits to learn how each salon usually assigns its workers seeing how work is divided inside the firm.

2 Measuring the division of labour

We can think of two polar cases for how labor is divided between workers. Firms can have specialists, workers that focus on a narrow set of tasks, or generalists, workers that perform a wide range of tasks. The generalist benchmark is the assignment in which each worker performs the same tasks as every other worker. The more a salon's actual assignment departs from this benchmark, the more specialized it is.

In practice, the software contains many different service descriptions, like those in Exhibit 1. To compare salons, Kohlhepp groups them into five task categories: haircut/shave; colour/highlight/wash; blow-dry/style/treatment/extensions; administration; and nail/spa/eye/miscellaneous. A salon's *task mix* is the share of its recorded work time spent on each category. Its *worker mix* is the share of work time supplied by each worker.

Exhibit 2 shows two ways to divide the same amount of work. Each cell gives a fraction of the salon's total work. In the left panel, each task goes to a different worker. In the right panel, every worker performs the salon's overall mix of tasks. This is the *generalist benchmark* described above. The workers' total shares of work and the salon's task mix are the same in both panels.

Exhibit 2. A specialized assignment and its generalist benchmark

	Specialized assignment					Generalist benchmark			
Worker	Task 1	Task 2	Task 3	Total	Worker	Task 1	Task 2	Task 3	Total
A	1/2	0	0	1/2	A	1/4	1/8	1/8	1/2
B	0	1/4	0	1/4	B	1/8	1/16	1/16	1/4
C	0	0	1/4	1/4	C	1/8	1/16	1/16	1/4
Total	1/2	1/4	1/4	1	Total	1/2	1/4	1/4	1

Source: Kohlhepp (2025), Figure 3. Row totals show workers' shares of all work; column totals show the salon's task mix.

Kohlhepp can then use the distribution of tasks and workers to calculate a *specialization index*, or *s-index*, which measures how far a salon's actual assignment lies from its generalist benchmark. It is zero for a generalist assignment and rises as workers concentrate on particular tasks. Holding worker shares and task mix fixed focuses the comparison on *who does what*.

The gains from specialization depend on workers' relative strengths and wages. Even a stylist who is faster at both cutting and colouring may be best used mainly for one of them. More specific assignments also take time to communicate and coordinate. The manager's time can therefore limit the division of labour, while technology can make coordination easier. We can now ask how specialization relates to the value of the services salons provide.

3 What the data on salons show

The prices and durations in Exhibit 1 allow us to measure *revenue productivity*—dollars earned per minute of service work. If a salon provides the same services in less time, this measure rises. It also rises if customers pay more for a service that takes the same time. What matters the most to us is that the way work is divided in the salon affects its overall productivity. For example, a salon might assign cutting and colouring to different stylists because each has a particular strength. If customers value the combined result, the salon may earn more from the visit even when the total service time stays the same.

Kohlhepp compares revenue per minute with the specialization index across 4,599 salon-quarters. Exhibit 3 first shows how much each measure varies across salons, then compares salons with different levels of specialization.

Exhibit 3. Specialization and revenue productivity

Across 4,599 salon-quarters	25th percentile	75th percentile
Revenue per service minute	$1.03	$2.05
Specialization index	0.03	0.41

Comparison	Main finding
Most-specialized quarter of salon-quarters versus least-specialized quarter	$1.08 more revenue per minute on average, or 68% higher
Same-size salons	Specialization still varies, and its positive association with revenue per minute remains

Source: Kohlhepp (2025), Tables 3–4 and discussion of Figure 5. Each percentile row ranks salon-quarters by the measure named in that row. The 68% compares average revenue per minute across groups ranked by specialization.

The 25th percentile of revenue productivity is $1.03 per minute: one quarter of salon-quarters earn at most that amount. At the 75th percentile, revenue per minute is $2.05, almost twice as high. There is also a lot of dispersion in the degree of specialization across salons, from 0.03 at its 25th percentile to 0.41 at its 75th (with 1 being full specialization).

The second table connects the revenue productivity and specialization. To see how they are connected, sort salon-quarters by specialization and compare the top quarter with the bottom quarter. The more specialized group earns, on average, $1.08 more per service minute—68% more than the less specialized group. Salon size alone does not account for this pattern: among salons with the same number of workers, specialization still differs and remains positively associated with revenue per minute.

How do the more specialized salons earn the extra revenue? They might serve more customers, earn more from each visit, or both. Exhibit 4 looks at these possibilities. It also reports how often a customer returns in a later quarter. A higher return rate can indicate that customers liked the services they

received. The last two rows connect specialization to teamwork within a visit and to salons' use of management software.

Exhibit 4. Customer value, teamwork, and software engagement

Outcome	s-index coefficient	Reading of the main finding
Number of customers	−0.0297	No statistically clear association after accounting for salon size
Revenue per customer	0.0320*	Positive association
Future customer return rate	0.0864***	Positive association
Teamwork among multi-service visits	0.6551***	Positive association
Software-feature adoption	Negative for general use, tips, prebooking, and staff requests	More specialized salons adopted these features earlier

Source: Kohlhepp (2025), Tables 5–6, selected results. The first three coefficients use standard-deviation units and account for salon size, task mix, place, and quarter. * and *** indicate statistical significance at 5% and 0.1%. The last row summarizes four adoption-time estimates; negative estimates mean earlier use of a feature.

The customer-count estimate is small relative to its uncertainty, so the study finds no clear relationship between specialization and the number of customers once it accounts for salon size and the other listed factors. Revenue per customer and the future return rate both rise with specialization. The coefficients describe the size of these associations: a salon with one standard deviation higher in specialization has, on average, revenue per customer 0.032 standard deviations higher and a future return rate 0.086 standard deviations higher.

Consider a visit like Grace's in Exhibit 1. A salon might pair a stylist strong at cutting with one strong at colouring, producing a result customers value enough to pay more for and return to buy again. If the total service time stays the same, the higher price raises revenue per minute. The higher return rate gives another clue that customers value the service. Exhibit 4 fits this account better than a story based on serving more customers.

The teamwork row measures the share of multi-service visits handled by more than one worker. This share rises with specialization. More specialized salons also adopt features such as prebooking and staff requests earlier. Those features can help a manager line up workers and coordinate handoffs, making a more detailed division of labour easier to manage.

Together, the exhibits show why organization inside a firm matters: salons with similar numbers of workers can arrange their work differently and earn different amounts per service minute. To learn the effect of the software itself, we would need to compare changes around adoption among salons that were otherwise on similar paths.

4 Assignment and span of control

Consider now a salon that needs two tasks, cutting (H) and colouring (C), and can use two worker types, A and B. Let a_{it} be units of task t completed per hour by worker i, and w_i the worker's hourly wage. At a given service quality, the labour cost of one unit of task t with worker i is w_i/a_{it}. Assume

$$\frac{a_{AH}}{a_{BH}} > \frac{a_{AC}}{a_{BC}} > 1, \qquad \frac{a_{AC}}{a_{BC}} < \frac{w_A}{w_B} < \frac{a_{AH}}{a_{BH}}.$$

Type A is more productive in both tasks (absolute advantage) but has a larger *comparative advantage* in cutting. At the stated wages, A has the lower labour cost per cut and B has the lower labour cost per colour. If coordination were effortless, the salon would assign cutting to A and colouring to B.

Specialized assignments take management time: someone must tell workers which services to perform and coordinate their schedules and handoffs. Let s measure specialization and T management technology. At $s = 0$, workers are generalists: over time, each worker performs the same mix of tasks as the salon as a whole. Higher s means workers concentrate on different tasks, but that entails more coordination making managing the saloon more difficult.

We can formalize these ideas. Managing a salon with n workers, specialization s and managing technology T requires $h(s, T)$ units of manager time per worker. However, there are only M units of available time, the *span-of-control* constraint is

$$n\, h(s, T) \leq M.$$

More specialization raises h: for a visit like Grace's, the manager must line up the cutter and colourist and pass along client requests. If assigning every cut to A and every colour to B would exceed M, the manager gives both workers a broader mix of tasks. This saves time but gives up some gains from comparative advantage.

The role of technology in task assignment. A booking system and shared client record lower $h(s, T)$ by shortening each handoff. A shared calendar, for example, lets the manager reserve A for a cut and line up B for the colour afterward. The saved time makes a more specialized assignment feasible with the same team. Better matching raises profit after wages, denoted $V(n, s)$. The manager could also use the time to supervise more workers if the extra appointments are profitable. The salon chooses the feasible team size and assignment with the highest profit.

Assignment and span-of-control reference
Compare w_A/a_{At} with w_B/a_{Bt} for each task. Choose n and s to maximize profit $V(n, s)$, subject to $nh(s, T) \leq M$. More specialization raises h; better management technology lowers it.

Question 1. How is work divided inside the salon? (25 marks)

(a) Use Exhibit 1 to compare the two visits and explain what the salon must coordinate when two workers serve one customer. How would many records of this kind reveal a salon's division of labour over a quarter? [10 marks]

(b) Use Exhibit 2 to explain the generalist benchmark and the s-index. Why do both panels keep the same worker and task totals? [15 marks]

Question 2. Who should cut and who should colour? (25 marks)

(a) Use the productivity and wage inequalities to compare labour unit costs. Assign cutting and colouring to the lower-cost workers and explain the role of comparative advantage. [15 marks]

(b) Suppose the salon gains access to more assignments. Hold required services, wages, and quality fixed. What happens to its minimum labour cost? When does cost fall strictly? [10 marks]

Question 3. Can management technology widen the span of control? (25 marks)

(a) Explain the span-of-control constraint $nh(s,T) \leq M$. How can better scheduling permit more division of labour at a fixed team size, or a larger team at a fixed assignment? [15 marks]

(b) Suppose a new booking system lowers $h(s,T)$. Use the cutting and colouring example to explain how the salon could move toward comparative-advantage assignments and raise profit. [10 marks]

Question 4. What do the exhibits establish? (25 marks)

(a) Interpret Exhibit 3's productivity and specialization comparison. Why does the comparison among same-size salons matter? Which fields in Exhibit 1 enter revenue per minute, and what can affect that measure? [10 marks]

(b) Use Exhibit 4 to discuss customer volume, the value of visits, teamwork, and software adoption. What further comparison would help assess the effect of software on productivity? [15 marks]

Reference

Kohlhepp, Jacob (2025). *The Inner Beauty of Firms*. June 30 working-paper version.