Resource flexibility: how it can unlock better decision-making through learning

Investing in flexible resources -- as opposed to dedicated (task-specific) ones -- can yield better data from which managers can learn more about underlying business trends. Discover the previously unexplored learning benefits of flexibility.



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- **Sales data tends to reflect available capacity rather than the real underlying demand, ignoring lost sales.**
- **Even when they can increase capacity to meet peak demand, many companies prefer not to, due to high costs, especially in volatile market**

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conditions.

- **Resource flexibility allows executives to better understand actual demand faster and learn from the data to make more profitable decisions.**

Here's a basic operational question: Do the benefits of having resource flexibility outweigh the costs?

Instead of the old "it depends," new research suggests that "yes, more often than you think" may be the answer, especially in fast-paced environments and when profit margins are moderate or lower. That is because of a previously unexplored benefit of resource flexibility: the ability to learn from it. IESE's Mihalis Markakis, coauthor of the paper "On the Learning Benefits of Resource Flexibility," published in *Management Science*, explains it thus:

"When we make capacity decisions, we generally look at historical data -- typically sales data. As long as demand does not exceed supply, this data should be sufficient. However, whenever sales data is not reflecting the real underlying demand, but rather the extent to which capacity is available, we're looking at censored data that ignores lost sales. Of course, increasing capacity to meet peak demand may be possible, but many companies prefer not to, since that can be very costly, especially in a rapidly fluctuating market. So, in the resulting tradeoff, sales may be sacrificed.

"Resource flexibility, however, mitigates the need for this tradeoff since production can be shifted as the market demands. This leads to more accurate figures to understand actual demand faster, and, in turn, gives us better predictive abilities. And with better insight, better capacity investments can be made in real time, leading to higher profitability."

Putting the pedal to the metal

What does resource flexibility look like in a business setting? Take a factory producing two cars, Model X and Model Y, with varying specifications. Resource flexibility means that capacity can be shifted to meet customers' fluctuating demand for X vs. Y, taking the overall profitability of each model into account. Risk pooling, operational hedging, and profit-maximization optionality are all well-known and thoroughly researched benefits of resource flexibility. Nevertheless, they all treat flexibility as merely the "ability to react," and they come at the (higher) cost of flexible capacity.

So, what about operations where margins are slimmer? Is the added cost worthwhile? This research finds that flexibility mitigates censoring, thus facilitating more knowledge of the

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true demand. In settings where learning may be important -- e.g., fast-paced environments -- this may endow companies with the ability to be proactive, resulting in higher profitability.

Methodology, very briefly

The learning benefits of resource flexibility were analyzed via models focused on a two-product capacity-decision problem, extended over two time periods, both of which involve capacity decisions. The results of the analyses show that the learning benefits of flexibility can have a significantly positive impact on profitability.

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