R&D: when it does (and doesn't) pay to invest

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Published

22 January 2018

Category

Strategy & Leadership

Key topics

Entrepreneurship, Innovation, Investment, Strategy

Research and development is expensive, and even some of the biggest names in tech can misjudge their markets. Our research has shown some of the factors that can make R&D investment worthwhile

Not every business idea makes it, as the Google graveyard shows. In the resting place for great ideas, you'll find long lost creations such as Google Buzz (a social networking tool that was dumped back in 2011) and Google Labs (a "playground" where users could test out prototype projects, which also died an early death).

Misjudging consumer demand can be costly, especially if a product goes to market – look at Iridium's satellite phones for instance. After spending $5 billion to launch a worldwide satellite phone network, the global satellite phone company filed for bankruptcy in 1999. This was an expensive way to find out whether demand for Iridium's concept existed.

Will consumers actually want a product? This is one of the great questions companies face. It's hard to manage this uncertainty, particularly for smaller businesses that often rely on a single product and lack the resources to diversify.

> Companies that stumble across insights unrelated to their field might not know how best to exploit them and further investment could be risky

But giants such as Amazon are very capable in experimenting with new ideas, learning first what it is their customers want and what the future revenue will be before scaling up and committing fully to a new business or service. Behind every success, however, there could be many more ideas that haven’t worked.

When should companies on the verge of launching a project pause, take stock and assess whether the time is right? And when should they spend yet more cash on testing the water? How do they know whether the investment will be worth their while?

We’ve examined when it might be beneficial for companies to wait and invest more in research and development (R&D). By looking at some 550 manufacturing companies, we see an uncertain market can actually motivate firms to delay the commercialisation of new products and prompt them to spend more on R&D. This allows them to experiment and gather more information. For some, this investment and caution pays off, but for others, it’s still a risky decision.

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Investing in extra research is all about finding out how best to exploit an uncertain market and the opportunities it offers. By uncertainty, we’re talking about the strength or tastes and trends in consumer demand – and it can help to know how to wait. This can be frustrating for companies on the brink of launch – their product all ready to go and the last thing they want to do is hold off and spend more. But it’s risky to just throw the dice and see if it works anyway.

If you press ahead regardless, by the time you know what’s wrong with the product, it’s already out there and you’ve wasted your cash. This investment, which can’t be recovered, also makes it harder to change direction and follow other promising leads. Usually companies cut back on investment when conditions are uncertain – that’s well known. What we see from our research is that uncertainty can actually prompt more investment, but this is only worth it under certain conditions that we’ve identified below.

It's only worth investing in R&D – trialling or refining a new product and getting consumer feedback – if a company has the right 'human capital': employees with the necessary expertise or scientific background to be able to conduct and learn from the extra research. If not, then money might be wasted.

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Likewise, if companies focus on innovation *within* their core business, then the subsequent benefits are higher. This makes sense: companies can turn new information into valuable knowledge when the learning relates to their field of expertise. Companies that stumble across insights unrelated to their field might not know how best to exploit them and further investment could be risky.

But the anticipated benefits from this investment also depend on how mature a certain market is. For highly developed markets such as conventional pharmaceuticals, this extra research doesn't yield such strong returns: competition is more intense, and innovations and gains are harder to come by. By contrast, younger sectors offer many more opportunities. Research investment in electric vehicles for instance is far more productive than in the well-developed market of petrol engines. Similarly, it can pay to devote efforts to biotechnology rather than conventional drug markets – there's more potential for return.

Companies facing an uncertain market might prefer to leave finance departments to judge whether investment in R&D is worth it. Our research suggests that combining strategy with an entrepreneurial approach might help with decisions: you can actively manage uncertainties and avoid surprises with these extra, timely investigations. You can dip your toe into the market – and it might prompt you to pause or withdraw a project altogether. Uncertainty can offer huge opportunities, and this is a way of limiting any downside. Caution and targeted funds can offer a looking glass into the future.

This article is based on research published in the Strategic Entrepreneurship Journal *: "Unlocking the value of real options: How firm-specific learning conditions affect R&D investments under uncertainty"*

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Visting Professor
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